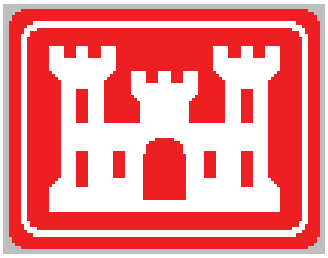
WATER CONTROL MANUAL

TYGART LAKE
Monongahela River Basin



U.S. ARMY CORPS OF ENGINEERS
PITTSBURGH DISTRICT
PITTSBURGH, PENNSYLVANIA

June 1982

Change 2 - 24 February 2020

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RECORD OF CHANGES

1. Change the Tygart Lake Reservoir Regulation Manual 1982, Change 1 dated 17Feb2010, as follows:

Revision	Date	Remove Old Pages	Insert New Pages
Change 2	24 February 2020	Cover	Cover
			Record of Changes
		Table of Contents page iii-iv	Table of Contents page iii-iv
		Plate 1	Plate 1
		Plate 6	Plate 6 (3 pages)
		Plate 7	Plate 7 (2 pages)
		Plates 10	Plate 10
			Plate 10.1 (18 pages)

2. Maintain this Record of Changes in front of the publication.

3. Nothing follows.

CELRP-OP-W

17 February 2010

MEMORANDUM FOR RECORD

SUBJECT: Change from NGVD29 to NAVD88 at Tygart Reservoir, PA

1. On 17 February 2010, the vertical datum used at Tygart Reservoir, PA (TGLW2) was changed from NGVD29 to NAVD88, requiring a change of -0.55' to all documents produced before 17 February 2010.

[redacted]

Hydraulic Engineer, Water Management Branch

OHIO RIVER AND TRIBUTARIES

RESERVOIR REGULATION MANUAL

FOR

TYGART LAKE

TYGART LAKE

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EXHIBIT

TYGART LAKE

PERTINENT DATA

Project Authorization

Public Works Administration Act of 11 January 1934 and Rivers and Harbors Act of 30 August 1935.

Location of Project

Taylor and Barbour Counties, West Virginia, 2.25 miles above Grafton and 22.7 miles above Fairmont, West Virginia, where the Tygart and West Fork Rivers join to form the Monongahela River.

Drainage Area

1,184 square miles.

Type of Project

Flood control and low-flow and water quality regulation reservoir.

Purpose

Flood stage reduction, low flow augmentation, and water quality regulation along the Monongahela and upper Ohio Rivers.

Dam

Type: Concrete gravity type

Elevation of Abutment Section: 1190 feet above m.s.l.

Height of Abutment Sections: 230 feet above stream bed (960)

Top Length: 1,921 feet

Top Width: 21 feet

Base Width: 207 feet at spillway section

Spillway

Type: Uncontrolled concrete gravity ogee section

Crest Elevation: 1,167 feet

Width: 489 feet, 4 inches

Design Flood:

Inflow - 335,000 c.f.s.

Outflow - 316,000 c.f.s. Combined flow, spillway and outlet works

Water Surface Elevation - 1196.0 feet m.s.l. (including wave action)

Outlet Works

Sluices: 8 main conduits 5'-8" x 10'-0", inlet invert elevation 995.0, outlet invert elevation 990.67

2 low-discharge conduits 4'-9" inside diameter, inlet invert elevation 990.67

Gates: 1 service and 1 emergency slide gate for each main conduit.

One 42" gate-valve and 1 emergency slide gate-valve for each low discharge conduit

Stilling Weir: 400 feet downstream from axis of dam

Crest Elevation 986; Overflow section 488 feet wide

Bankfull Discharge: 18,300 c.f.s.

Reservoir

Pool	Elevation		Capacity Ac.Ft.	Capacity Inches	Area Acres	Backwater Miles
Minimum	1010		11,200	0.18	660	6.4
L.W. Reg (Summer)	1094	(Net)	100,000	1.58	1,750	10.1
Flood Control (Winter)		(Net)	278,400	4.41		
Flood Control (Summer Min)		(Net)	178,400	2.83		
Total Storage	1167		289,600	4.59	3,440	13.1

Taking Line: 1190 feet m.s.l.

MINIMUM OUTFLOW = 100 CFS

OHIO RIVER AND TRIBUTARIES

RESERVOIR REGULATION MANUAL

FOR

TYGART LAKE

AUTHORIZATION

1. Authority. - This manual is prepared in accordance with instructions contained in paragraph 5 of Engineering Regulation 1110-2-240 and Paragraphs 6-01 through 6-03 of Engineer Manual 1110-2-3600 dated 25 May 1959, and titled Reservoir Regulation (revised 10 October 1961).

MONONGAHELA RIVER BASIN - GENERAL

2. Description. - The Monongahela River basin contains about 39 percent of the drainage area above Pittsburgh, Pennsylvania. Its location in the upper Ohio River basin is shown on Plate 1. The Monongahela River basin contains four main tributaries: West Fork, Tygart, Cheat, and Youghiogheny Rivers. The headwaters of the West Fork and Tygart Rivers are primarily in the southern unglaciated Allegheny Plateau. The headwaters of the Cheat and Youghiogheny Rivers are in the Ridge and Valley area. The Allegheny Plateau is mature in its dissection, with rugged, high rolling hills. The narrow, steepsided side valleys are conducive to rapid runoff. The main channels are marked with placid reaches with many meanders alternating with rough and turbulent reaches. This variance is caused by differential erosion as the stream flows over succeeding outcrops.

The Ridge and Valley area is known for the high parallel crests of Chestnut Ridge and Laurel Hill. The Upper Cheat and Youghiogheny Rivers have cut prominent gorges through these mountains in maintaining their ancient drainage course northwestward into the Monongahela River. Each gorge is about four miles long with the streambed characterized by rapids and waterfalls resulting from differential erosion in the folded bedrock.

3. The pertinent population centers in the Monongahela River basin are listed in the following table:

TABLE 1

MONONGAHELA BASIN POPULATION CENTERS

Population Center	Stream	Population (1970)
Pittsburgh, Pa.	Monongahela R.	520,117
McKeesport, Pa.	"	37,977
Monongahela, Pa.	"	7,113
Charleroi, Pa.	"	6,723
Brownsville, Pa.	"	4,856
Connellsville, Pa.	Youghiogheny R.	11,643
Uniontown, Pa.	Redstone Cr.	16,282
Morgantown, W. Va.	Monongahela R.	29,431
Fairmont, W. Va.	"	26,093
Clarksburg, W. Va.	West Fork R.	24,864
Grafton, W. Va.	Tygart R.	6,433
Rowlesburg, W. Va.	Cheat R.	829
Parsons, W. Va.	Cheat R.	1,784
Weston, W. Va.	West Fork R.	7,323
Buckhannon, W. Va.	Buckhannon R.	7,261
Elkins, W. Va.	Tygart R.	8,287
Philippi, W. Va.	Tygart R.	3,002
Belington, W. Va.	"	1,567

These locations are shown on Plate 2.

4. Hydrologic Data. - The climate in the Monongahela River basin is temperate and humid with a marked seasonal variation in temperature. Frequent and rapid changes in weather are due to frontal air mass activity. Prevailing wind direction is from the west or has a westerly component. Temperatures above 90 degrees F. in the summer and below zero in the winter are recorded normally 12 days and 5 days, respectively, per year, with extremes of 105 degrees F. and minus 40 degrees F. on record. The mean temperature is about 70 degrees F. in summer and 30 degrees F. in winter.

5. Precipitation is well distributed throughout the seasons with a normal annual total of about 45 inches over the basin, varying from 36 to 63 inches, with the higher amounts occurring in the southwestern portion of the watershed. The monthly normal precipitation is highest in June or July with about 4.5 inches and lowest in November with about 3.0 inches.

6. Average annual snowfall over the basin ranges from 38 inches in the lower Monongahela valley to 107 inches in the higher mountain areas of West Virginia. Snow cover is generally subject to melting throughout the winter season and is frequently a contributing factor to winter and early spring flood runoff.

7. River stages rise appreciably above flood heights about two or three times a year. The highest flood stages in the upper Monongahela River basin occurred in July 1888. Other floods of high magnitude occurred in July 1912, March 1918, March 1936, October 1937, June 1941, October 1954, March 1963, March 1967, and June 1972. A study of floods

significantly indicates a possibility of serious flooding during any season of the year. However, the frequency of flooding is highest in the late winter-early spring season.

8. River Development and Flood Control Projects. - The Monongahela River system is afforded flood protection along its main tributaries by reservoirs and channel improvements constructed by the Corps of Engineers. There are five towns in the basin in which flood protection projects have been constructed: Granville, Pa.; Turtle Creek, Pa.; Elkins, W. Va.; Buckhannon, W. Va.; and Friendsville, Md. All have been turned over to local authorities. These channel improvements are very effective and have sufficient capacity to confine all floods of record.

9. There are two Federal multi-purpose reservoirs in the Monongahela River basin: Tygart Lake and Youghiogheny River Lake. Tygart Lake is effective for flood reduction throughout the Monongahela River valley. By releasing low-flow storage, it provides an assured flow of 340 c.f.s. in the upper reach of the Monongahela River above the mouth of the Cheat River, thus maintaining uninterrupted navigation during low-flow periods. Youghiogheny River Lake provides flood protection throughout the Youghiogheny River and lower Monongahela River valleys. It also augments downstream flow in accordance with available reservoir storage conditions and the uncontrolled flow of the Youghiogheny River at Connellsville, Pennsylvania. The average augmentation during the low-flow season is about 500 c.f.s.

10. There are two privately-owned hydropower projects in the Monongahela River basin: Lake Lynn, on the Cheat River near its mouth; and Deep Creek Lake, in the headwaters of the Youghiogheny River upstream of the dam. Lake Lynn is owned and operated by West Penn Power Company

and Deep Creek Lake is owned and operated by Pennsylvania Electric Company. They are used to supply power at peak times during the day and have no appreciable storage. Operations on these reservoirs are not coordinated with those on the Federal reservoirs.

11. Tygart Lake and Youghiogheny River Lake, in combination with Kinzua, Tionesta, East Branch Clarion, Mahoning, Crooked Creek, Conemaugh, Loyalhanna, Berlin, M. J. Kirwan, Shenango, Mosquito Creek, Union City and Woodcock Reservoirs provide flood protection for the upper Ohio River basin valleys. Locations of the flood control works in the Pittsburgh Engineer District are shown on Plate 1.

TYGART LAKE - GENERAL

12. Project Authorization. - Tygart Lake was authorized by the Public Works Administration on 11 January 1934 and adopted by the Rivers and Harbors Act approved 30 August 1935.

13. Project Document. - The authorization of Tygart Lake in West Virginia is contained in the Flood Control Act (Public Law No. 409 of the 74th Congress) (HR 6732), approved 30 August 1935.

14. Public Hearings. - No public hearings restricted to Tygart Lake were held.

15. Costs and Benefits. - The total construction cost, including relocations and purchase of rights-of-way, was $18,431,844. The total cost of operation and maintenance as of 30 June 1975 was $2,658,158. The total cost of the reservoir as of 30 June 1975 was $21,090,002. The total benefits in the Pittsburgh Engineer District attributable to Tygart Lake through 30 June 1975 amounted to $140,363,300, or nearly seven times the total cost of the project. Table 2 shows the benefit values for individual years.

TABLE 2

ANNUAL PITTSBURGH DISTRICT BENEFITS FROM TYGART LAKE

Fiscal Year	Benefits
1938	$ 775,900
1939	170,100
1940	341,800
1941	93,000
1942	0
1943	5,401,600
1944	0
1945	463,500
1946	0
1947	0
1948	4,749,300
1949	191,000
1950	28,100
1951	3,292,700
1952	2,427,300
1953	0
1954	0
1955	17,367,600
1956	842,800
1957	546,100
1958	192,900
1959	4,624,000
1960	6,003,400
1961	71,700
1962	70,000
1963	6,561,900
1964	5,603,700
1965	22,800
1966	3,906,800
1967	10,322,300
1968	1,323,000
1969	8,700
1970	1,089,100
1971	96,500
1972	56,333,800
1973	3,241,800
1974	2,922,000
1975	1,278,100
Total	$140,363,300

16. Basin Characteristics. - The area tributary to Tygart Lake lies in northeastern West Virginia between the approximate limits of 38° 27' to 39° 23' North Latitude and 79° 43' to 80° 23' West Longitude. This area as shown on Plate 3 is roughly elliptical in shape, being approximately 65 miles from north to south and 25 miles east to west at its maximum width. The drainage area above the dam is 1,184 square miles.

17. The Tygart River originates in the mountainous area of northeastern West Virginia and flows in a generally northerly direction. The course is sinuous in the headwaters with more sweeping meanderings in the lower reaches. The Tygart River joins the West Fork River at Fairmont, West Virginia, to form the Monongahela River. The dam is located in Taylor County, West Virginia, 22.7 miles above the mouth of the Tygart River at Fairmont, West Virginia, and 2.2 miles above Grafton, West Virginia.

18. The surface of the basin above Tygart Dam varies in elevation from 960 feet above sea level in the stream bed at the dam to about 4,700 feet at the southern tip of the basin, making a total relief of 3,740 feet. The average basin relief varies from 400 to 500 feet in the northern and western sections to about 1,300 feet in the upper reaches. In its eastern portion, the basin is very rugged, but it becomes progressively less mountainous toward the west. The entire region has been denuded of its original forest except in the more rugged and mountainous areas. The valleys in general are narrow with steep hillsides. Rock formations are principally shale, sandstone, coal, and limestone.

The Tygart River valley is an eroded anticline. The present geologic period is one of erosion. In general, the topography consists of a warped and eroded remnant of four peneplains with a few monadnocks rising a few hundred feet above the general surface of the peneplain. An example of one is Lonetree Knob on Rich Mountain at 3,563 feet.

19. The main channel of the Tygart River from Grafton to the source is 112.6 miles long and quite sinuous, with an average slope of 13 feet per mile of the primary length. Some of the tributaries, however, are much steeper, with average slopes approximately three times that of the main channel. Due to the steep ground slopes and the consequent rapidity with which surface water reaches the stream channels, the opportunity for infiltration into the soil is reduced, and the time of concentration of flood flows in the basin is decreased. The factors of stream slope and ground configuration, thus, are conducive to a rapid rate of runoff. For example, it has been observed that under uniform rainfall conditions approximately 70% of the runoff volume of a 12-hour unit storm over the Tygart basin occurs in 48 hours. The following table summarizes the drainage areas and slopes of the Tygart River and its tributaries.

TABLE 3
DRAINAGE AREAS AND SLOPES ABOVE DAM
TYGART RIVER AND TRIBUTARIES

	Drainage Area Sq.Mi.	Distance of Mouth above Dam Mi.	Length of Stream Mi.	Elevation		Average Slope, Ft.per Mi.			
						Primary		Secondary	
				Mouth	Source	Length	Slope	Length	Slope
Tygart River	1183.7	-	110.3	857*	4000	97	13	13.3	133
Leading Creek	60.5	54.6	16.7	1875	2350	14.5	8	2.2	159
Roaring Creek	29.1	50.4	13.6	1875	3100	9.0	59	4.6	154
Middle Fork River	151.1	31.0	39.8	1500	3700	31.3	24	8.5	171
Buckhannon River	293.8	27.2	62.5	1325	3600	45.2	11	17.3	103
Laurel Creek	54.4	14.1	17.3	1250	2250	15.3	29	2.0	300
Teter Creek	53.3	11.6	14.3	1175	2300	12.0	56	2.3	196
Sandy Creek	88.9	6.4	14.8	1025	2350	12.4	29	2.4	400

* Elevation at mouth of Tygart River at Fairmont

20. Construction. - The initial phase of the Tygart Lake project began in December 1934 with the award of the first contract. Full flood control regulation began in June 1938. The following table presents the progress of construction of the project.

CONSTRUCTION AND COMPLETION DATA

Phase	Date	
	Start	End
Relocations:		
Railroads	October 1935	May 1937
Highways	Indefinite	May 1945
Dam Construction:		
River Cofferdams		
First Unit	February 1935	April 1935
Second Unit	October 1935	November 1935
Dam Structure, Concrete Completed		February 1938
Partial Flood Control Regulation	October 1937	June 1938
Full Flood Control Regulation	June 1938	

21. Dam. - The dam is of the concrete gravity-section type. The abutment section rises to a height of 230 feet above the stream bed elevation 960; the base width at the spillway section is 207 feet; the top length of the concrete structure is 1,921 feet. Further details are shown on Plate 4.

22. Spillway. - The spillway, built as part of the concrete dam structure, is of ogee, gravity section and is uncontrolled. The crest at elevation 1167 has a length of 489 feet. The spillway design (free) discharge is 271,000 c.f.s., with a maximum water surface at elevation 1196.0. The spillway rating curve is shown on Plate 5.

23. Stilling Basin. - The stilling basin extends 400 feet downstream from the axis of the dam. The overflow section is 488 feet wide and has a crest elevation of 986 feet.

24. Outlet Works. - The outlet works consist of 8 sluices through the dam with outlet invert elevation 984 and inlet invert elevation 995. The inlets are protected by trash racks. Each sluice is controlled by two (one service and one emergency) 5'-8" x 10' slide gates, operated hydraulically from within the dam. There are also two low-discharge conduits, each regulated by a 42-inch gate-valve at centerline elevation 993.5. They are provided with 5'-8" x 6' hydraulically-operated emergency slide gates. A rating curve for the 5'-8" x 10' sluice gates is shown as Plate 6. A rating curve for the 42-inch gate-valves is shown as Plate 7.

25. Model Studies. - The hydraulic factors involved in the design of the dam were investigated with four models. They were: a comprehensive general model of the structure, a model of a rectangular conduit outlet, a model of a rectangular conduit entrance section, and a sectional model of a portion of the spillway, stilling pool, and stilling weir. Results of these model tests were not only used for design purposes but have been used in scheduling the arrangement and order of slide gate openings for release of flood storage.

26. Diversion During Construction. - During construction of the dam, river flow was constricted by cofferdams while the river monoliths were being placed. The cofferdams were set sufficiently high so that a flood of about a 2.5-year frequency could be passed without overtopping the cofferdam, and sufficiently low so that a flood of maximum proportions could be passed with the least possible risk of upstream damage. No floods overtopped the first cofferdam, but two floods were experienced during the use of the second cofferdam.

27. Reservoir Outflow Controls. - Under flood conditions, discharge of water during storage and storage release periods is effected by use of one or more of the 8 slide gates. The sluices are of sufficient size and number to discharge bankfull capacity with the pool as low as elevation 1031 (21 feet above minimum pool), above which elevation 94% of the winter flood storage capacity lies. The order of gate openings provides optimum flow conditions in the stilling basin as shown by model studies. For low-flow regulation the two 42-inch gate-valves are available for fine control of small discharges. The discharge rating curve for the outflow station at Carr China is shown on Plate 8.

28. Bankfull Capacity. - At the time the dam was constructed, a flow of 25,000 c.f.s. could be passed below the dam before appreciable overbank occurred. However, due to flood plain encroachment in the intervening years, in the Tygart River reach immediately below the dam, appreciable overbank flow now occurs when the discharge exceeds about 18,300 c.f.s.

29. Area and Capacity of Reservoir. - A topographic map of the area to an elevation of 1200 feet was developed from a plane table

survey made in 1934. The results were plotted on maps to a scale of one inch equals 500 feet with a contour interval of 5 feet. Values for the elevation-area relation were obtained by determining the area at various contours. The elevation-capacity relation was derived from the elevation-area relationship by averaging the areas at equal intervals by the end-area method. From these relationships the area of the reservoir at full pool 1167 was found to be 3,440 acres and the gross capacity 289,600 acrefeet, representing 4.59 inches of runoff. Elevation-area and elevation-capacity curves are shown on Plate 9. Table 4 gives a tabulation of the storage-elevation relationship between elevations 1000 and 1180.

30. Storage Allocations. - The permanent storage of about 11,200 acre-feet corresponds to elevation 1010 (minimum pool). There is a maximum of 278,400 acre-feet or 4.41 inches of equivalent runoff storage capacity available for flood control for the period mid-December through mid-March inclusive. Flood control capacity progressively decreases from mid-March through April as water is stored for low-flow regulation. With normal runoff, flood control capacity progressively increases through the summer and fall as low-flow storage is released. If runoff is much above normal during the period June through mid-September, the reservoir pool may be held at the maximum summer low-flow regulation level of 1094 as long as flow criteria are met by local flow. At this time, 178,400 acre-feet or 2.83 inches of equivalent runoff would be available for flood control. The remaining usable reservoir capacity of 100,000 acre-feet would be available for low-flow regulation. Plate 10 presents the storage allocation for the reservoir. Its development is discussed later.

TABLE 4
TYGART RESERVOIR
CAPACITY TABLE

1000.0 - 1014.9
Sheet 1 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1000.00	5,900	(45)	1003.00	7,250	(49)	1006.00	8,790	(57)	1009.00	10,560	(64)	1012.00	12,530	(69)
.10	5,943	4	.10	7,299	5	.10	8,847	6	.10	10,624	6	.10	12,599	7
.20	5,986	9	.20	7,348	10	.20	8,904	11	.20	10,688	13	.20	12,668	14
.30	6,029	13	.30	7,397	15	.30	8,961	17	.30	10,752	19	.30	12,737	21
.40	6,072	17	.40	7,446	20	.40	9,018	23	.40	10,816	26	.40	12,806	28
.50	6,115	22	.50	7,495	24	.50	9,075	28	.50	10,880	32	.50	12,875	34
.60	6,158	26	.60	7,544	29	.60	9,132	34	.60	10,944	38	.60	12,946	40
.70	6,201	30	.70	7,593	34	.70	9,189	40	.70	11,008	45	.70	13,013	48
.80	6,244	34	.80	7,642	39	.80	9,246	46	.80	11,072	51	.80	13,082	55
.90	6,287	39	.90	7,691	44	.90	9,303	51	.90	11,136	58	.90	13,151	62
1001.00	6,330	(45)	1004.00	7,740	(51)	1007.00	9,360	(59)	1010.00	11,200	(66)	1013.00	13,220	(71)
.10	6,375	4	.10	7,791	5	.10	9,419	6	.10	11,266	7	.10	13,291	7
.20	6,420	9	.20	7,842	10	.20	9,478	12	.20	11,332	13	.20	13,362	14
.30	6,465	14	.30	7,893	15	.30	9,537	18	.30	11,398	20	.30	13,433	21
.40	6,510	18	.40	7,944	20	.40	9,596	24	.40	11,464	26	.40	13,504	28
.50	6,555	22	.50	7,995	26	.50	9,655	30	.50	11,530	33	.50	13,575	36
.60	6,600	27	.60	8,046	31	.60	9,714	35	.60	11,596	40	.60	13,646	43
.70	6,645	32	.70	8,097	36	.70	9,773	41	.70	11,662	46	.70	13,717	50
.80	6,690	36	.80	8,148	41	.80	9,832	47	.80	11,728	53	.80	13,788	57
.90	6,735	40	.90	8,199	46	.90	9,891	53	.90	11,794	59	.90	13,859	64
1002.00	6,780	(47)	1005.00	8,250	(54)	1008.00	9,950	(61)	1011.00	11,860	(67)	1014.00	13,930	(72)
.10	6,827	5	.10	8,304	5	.10	10,011	6	.10	11,927	7	.10	14,002	7
.20	6,874	9	.20	8,358	11	.20	10,072	12	.20	11,994	13	.20	14,074	14
.30	6,921	14	.30	8,412	16	.30	10,133	18	.30	12,061	20	.30	14,146	22
.40	6,968	19	.40	8,466	22	.40	10,194	24	.40	12,128	27	.40	14,218	29
.50	7,015	24	.50	8,520	27	.50	10,255	30	.50	12,195	34	.50	14,290	36
.60	7,062	28	.60	8,574	32	.60	10,316	37	.60	12,262	40	.60	14,362	43
.70	7,109	33	.70	8,628	38	.70	10,377	43	.70	12,329	47	.70	14,434	50
.80	7,156	38	.80	8,682	43	.80	10,438	49	.80	12,396	54	.80	14,506	59
.90	7,203	42	.90	8,736	49	.90	10,499	55	.90	12,463	60	.90	14,578	65

TYGART RESERVOIR
CAPACITY TABLE

1015.0 - 1029.9
Sheet 2 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1015.00	14,650	(73)	1018.00	16,880	(78)	1021.00	19,260	(82)	1024.00	21,750	(85)	1027.00	24,330	(88)
.10	14,723	7	.10	16,958	8	.10	19,342	8	.10	21,835	8	.10	24,418	9
.20	14,796	15	.20	17,036	16	.20	19,424	16	.20	21,920	17	.20	24,506	18
.30	14,869	22	.30	17,114	23	.30	19,506	25	.30	22,005	26	.30	24,594	26
.40	14,942	29	.40	17,192	31	.40	19,588	33	.40	22,090	34	.40	24,682	35
.50	15,015	36	.50	17,270	39	.50	19,670	41	.50	22,175	42	.50	24,770	44
.60	15,088	44	.60	17,348	47	.60	19,752	49	.60	22,260	51	.60	24,858	53
.70	15,161	51	.70	17,426	55	.70	19,834	57	.70	22,345	60	.70	24,946	62
.80	15,234	58	.80	17,504	62	.80	19,916	66	.80	22,430	68	.80	25,034	70
.90	15,307	66	.90	17,582	70	.90	19,998	74	.90	22,515	76	.90	25,122	79
1016.00	15,380	(74)	1019.00	17,660	(79)	1022.00	20,080	(83)	1025.00	22,600	(86)	1028.00	25,210	(89)
.10	15,454	7	.10	17,739	8	.10	20,163	8	.10	22,686	9	.10	25,299	9
.20	15,528	15	.20	17,818	16	.20	20,246	17	.20	22,772	17	.20	25,388	18
.30	15,602	22	.30	17,897	24	.30	20,329	25	.30	22,858	26	.30	25,477	27
.40	15,676	30	.40	17,976	32	.40	20,412	33	.40	22,944	34	.40	25,566	36
.50	15,750	37	.50	18,055	40	.50	20,495	42	.50	23,030	43	.50	25,655	44
.60	15,824	44	.60	18,134	47	.60	20,578	50	.60	23,116	52	.60	25,744	53
.70	15,898	52	.70	18,213	55	.70	20,661	58	.70	23,202	60	.70	25,833	62
.80	15,972	59	.80	18,292	63	.80	20,744	66	.80	23,288	69	.80	25,922	71
.90	16,046	67	.90	18,371	71	.90	20,827	75	.90	23,374	77	.90	26,011	80
1017.00	16,120	(76)	1020.00	18,450	(81)	1023.00	20,910	(84)	1026.00	23,460	(87)	1029.00	26,100	(90)
.10	16,196	8	.10	18,531	8	.10	20,994	8	.10	23,547	9	.10	26,190	9
.20	16,272	15	.20	18,612	16	.20	21,078	17	.20	23,634	17	.20	26,280	18
.30	16,348	23	.30	18,693	24	.30	21,162	25	.30	23,721	26	.30	26,370	27
.40	16,424	30	.40	18,774	32	.40	21,246	34	.40	23,808	35	.40	26,460	36
.50	16,500	38	.50	18,855	40	.50	21,330	42	.50	23,895	44	.50	26,550	45
.60	16,576	46	.60	18,936	49	.60	21,414	50	.60	23,982	52	.60	26,640	54
.70	16,652	53	.70	19,017	57	.70	21,498	59	.70	24,069	61	.70	26,730	63
.80	16,728	61	.80	19,098	65	.80	21,582	67	.80	24,156	70	.80	26,820	72
.90	16,804	68	.90	19,179	73	.90	21,666	76	.90	24,243	78	.90	26,910	81

TYGART RESERVOIR
CAPACITY TABLE

1030.0-1044.9
Sheet 3 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1030.00	27,000	(91)	33.00	29,770	(95)	36.00	32,660	(99)	39.00	35,670	(103)	42.00	38,810	(107)
.10	27,091	9	.10	29,865	10	.10	32,759	10	.10	35,773	10	.10	38,917	11
.20	27,182	18	.20	29,960	19	.20	32,858	20	.20	35,876	21	.20	39,024	22
.30	27,273	27	.30	30,055	28	.30	32,957	30	.30	35,979	31	.30	39,131	33
.40	27,364	36	.40	30,150	38	.40	33,050	40	.40	36,082	41	.40	39,239	43
.50	27,455	46	.50	30,245	48	.50	33,155	50	.50	36,185	52	.50	39,345	53
.60	27,546	55	.60	30,340	57	.60	33,254	59	.60	36,288	62	.60	39,452	64
.70	27,637	64	.70	30,435	66	.70	33,353	69	.70	36,391	72	.70	39,559	75
.80	27,728	73	.80	30,530	76	.80	33,452	79	.80	36,494	82	.80	39,666	86
.90	27,819	82	.90	30,625	86	.90	33,551	89	.90	36,597	93	.90	39,773	98
1031.00	27,910	(92)	34.00	30,720	(96)	37.00	33,650	(100)	40.00	36,700	(105)	43.00	39,880	(110)
.10	28,002	9	.10	30,816	10	.10	33,750	10	.10	36,805	10	.10	39,986	11
.20	28,094	18	.20	30,912	19	.20	33,850	20	.20	36,910	21	.20	40,096	22
.30	28,186	28	.30	31,008	29	.30	33,950	30	.30	37,015	32	.30	40,204	33
.40	28,278	37	.40	31,104	38	.40	34,050	40	.40	37,120	42	.40	40,312	43
.50	28,370	46	.50	31,200	48	.50	34,150	50	.50	37,225	52	.50	40,420	54
.60	28,462	55	.60	31,296	58	.60	34,250	60	.60	37,330	63	.60	40,528	65
.70	28,554	64	.70	31,392	67	.70	34,350	70	.70	37,435	73	.70	40,636	75
.80	28,646	74	.80	31,488	77	.80	34,450	80	.80	37,540	84	.80	40,744	86
.90	28,738	83	.90	31,584	86	.90	34,550	90	.90	37,645	94	.90	40,852	97
1032.00	28,830	(94)	35.00	31,680	(98)	38.00	34,650	(102)	41.00	37,750	(106)	44.00	40,960	(109)
.10	28,924	9	.10	31,778	10	.10	34,752	10	.10	37,856	11	.10	41,069	11
.20	29,018	19	.20	31,876	20	.20	34,854	20	.20	37,962	21	.20	41,178	22
.30	29,112	28	.30	31,974	29	.30	34,956	31	.30	38,068	32	.30	41,287	33
.40	29,206	38	.40	32,072	39	.40	35,058	41	.40	38,174	42	.40	41,396	44
.50	29,300	47	.50	32,170	49	.50	35,160	51	.50	38,280	53	.50	41,505	54
.60	29,394	56	.60	32,268	59	.60	35,262	61	.60	38,386	64	.60	41,614	65
.70	29,488	66	.70	32,366	69	.70	35,364	71	.70	38,492	74	.70	41,723	76
.80	29,582	75	.80	32,464	78	.80	35,466	82	.80	38,598	85	.80	41,832	87
.90	29,676	85	.90	32,562	88	.90	35,568	92	.90	38,704	95	.90	41,941	98

1045.0 - 1059.9

Sheet 4 of 12

TYGART RESERVOIR
CAPACITY TABLE

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1045 .00	42,050		1048 .00	45,410		1051 .00	48,860		1054 .00	52,430		1057 .00	56,130	
.10	42,161	(111)	.10	45,524	(114)	.10	48,977	(117)	.10	52,552	(122)	.10	56,257	(127)
.20	42,272	11	.20	45,638	11	.20	49,094	12	.20	52,674	12	.20	56,384	13
.30	42,383	22	.30	45,752	23	.30	49,211	23	.30	52,796	24	.30	56,511	25
.40	42,494	33	.40	45,866	34	.40	49,328	35	.40	52,918	37	.40	56,638	38
.50	42,605	44	.50	45,980	46	.50	49,445	47	.50	53,040	49	.50	56,765	51
.60	42,716	56	.60	46,094	57	.60	49,562	58	.60	53,162	61	.60	56,892	64
.70	42,827	67	.70	46,208	68	.70	49,679	70	.70	53,284	73	.70	57,019	76
.80	42,938	78	.80	46,322	80	.80	49,796	82	.80	53,406	85	.80	57,146	89
.90	43,049	89	.90	46,436	91	.90	49,913	94	.90	53,528	98	.90	57,273	102
1046 .00	43,160	100	1049 .00	46,550	103	1052 .00	50,030	105	1055 .00	53,650	110	1058 .00	57,400	114
.10	43,272	(112)	.10	46,665	(115)	.10	50,149	(119)	.10	53,773	(123)	.10	57,529	(129)
.20	43,384	12	.20	46,780	12	.20	50,268	12	.20	53,896	12	.20	57,658	13
.30	43,496	24	.30	46,895	23	.30	50,387	24	.30	54,019	25	.30	57,787	26
.40	43,608	36	.40	47,010	34	.40	50,506	36	.40	54,142	37	.40	57,916	39
.50	43,720	45	.50	47,125	46	.50	50,625	48	.50	54,265	49	.50	58,045	52
.60	43,832	56	.60	47,240	58	.60	50,744	60	.60	54,388	62	.60	58,174	64
.70	43,944	67	.70	47,355	69	.70	50,863	71	.70	54,511	74	.70	58,303	77
.80	44,056	78	.80	47,470	80	.80	50,982	83	.80	54,634	86	.80	58,432	90
.90	44,168	90	.90	47,585	92	.90	51,101	95	.90	54,757	98	.90	58,561	103
1047 .00	44,280	101	1050 .00	47,700	104	1053 .00	51,220	107	1056 .00	54,880	111	1059 .00	58,690	116
.10	44,393	(113)	.10	47,816	(116)	.10	51,341	(121)	.10	55,005	(125)	.10	58,821	(131)
.20	44,506	11	.20	47,932	12	.20	51,462	12	.20	55,130	12	.20	58,952	13
.30	44,619	23	.30	48,048	23	.30	51,583	24	.30	55,255	25	.30	59,083	26
.40	44,732	34	.40	48,164	35	.40	51,704	36	.40	55,380	38	.40	59,214	39
.50	44,845	45	.50	48,280	46	.50	51,825	48	.50	55,505	50	.50	59,345	52
.60	44,958	56	.60	48,396	58	.60	51,946	60	.60	55,630	62	.60	59,476	66
.70	45,071	68	.70	48,512	70	.70	52,067	73	.70	55,755	75	.70	59,607	79
.80	45,184	79	.80	48,628	81	.80	52,188	85	.80	55,880	88	.80	59,738	92
.90	45,297	90	.90	48,744	93	.90	52,309	97	.90	56,005	100	.90	59,869	105
		102			104			109			112			118

TYGART RESERVOIR
CAPACITY TABLE

1060.0-1074.9
Sheet 5 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1060.00	60,000	(131)	63.00	63,960	(134)	66.00	68,000	(136)	69.00	72,110	(139)	72.00	76,320	(144)
.10	60,131	13	.10	64,094	13	.10	68,136	14	.10	72,249	14	.10	76,464	[illegible]
.20	60,262	26	.20	64,228	27	.20	68,272	27	.20	72,388	28	.20	76,608	29
.30	60,393	39	.30	64,362	40	.30	68,408	41	.30	72,527	42	.30	76,752	43
.40	60,524	52	.40	64,496	54	.40	68,544	55	.40	72,666	56	.40	76,896	[illegible]
.50	60,655	66	.50	64,630	67	.50	68,680	68	.50	72,805	70	.50	77,040	72
.60	60,786	79	.60	64,764	80	.60	68,816	82	.60	72,944	83	.60	77,184	[illegible]
.70	60,917	92	.70	64,898	94	.70	68,952	96	.70	73,083	97	.70	77,328	[illegible]
.80	61,048	105	.80	65,032	107	.80	69,088	109	.80	73,222	111	.80	77,472	[illegible]
.90	61,179	118	.90	65,166	121	.90	69,224	123	.90	73,361	125	.90	77,616	[illegible]
1061.00	61,310	(132)	64.00	65,300	(135)	67.00	69,360	(137)	70.00	73,500	(140)	73.00	77,760	(144)
.10	61,442	13	.10	65,435	14	.10	69,497	14	.10	73,640	14	.10	77,906	15
.20	61,574	26	.20	65,570	27	.20	69,634	27	.20	73,780	28	.20	78,052	29
.30	61,706	40	.30	65,705	40	.30	69,771	41	.30	73,920	42	.30	78,198	44
.40	61,838	53	.40	65,840	54	.40	69,908	55	.40	74,060	56	.40	78,344	58
.50	61,970	66	.50	65,975	68	.50	70,045	68	.50	74,200	70	.50	78,490	73
.60	62,102	79	.60	66,110	81	.60	70,182	82	.60	74,340	84	.60	78,636	88
.70	62,234	92	.70	66,245	94	.70	70,319	96	.70	74,480	98	.70	78,782	102
.80	62,366	106	.80	66,380	108	.80	70,456	110	.80	74,620	112	.80	78,928	117
.90	62,498	119	.90	66,515	122	.90	70,593	123	.90	74,760	126	.90	79,074	131
1062.00	62,630	(133)	65.00	66,650	(135)	68.00	70,730	(138)	71.00	74,900	(142)	74.00	79,220	(147)
.10	62,763	13	.10	66,785	14	.10	70,868	14	.10	75,042	14	.10	79,367	15
.20	62,896	27	.20	66,920	27	.20	71,006	28	.20	75,184	28	.20	79,514	29
.30	63,029	40	.30	67,055	40	.30	71,144	41	.30	75,326	43	.30	79,661	44
.40	63,162	53	.40	67,190	54	.40	71,282	55	.40	75,468	57	.40	79,808	59
.50	63,295	66	.50	67,325	68	.50	71,420	69	.50	75,610	71	.50	79,955	74
.60	63,428	80	.60	67,460	81	.60	71,558	83	.60	75,752	85	.60	80,102	88
.70	63,561	93	.70	67,595	94	.70	71,696	97	.70	75,894	99	.70	80,249	103
.80	63,694	106	.80	67,730	108	.80	71,834	110	.80	76,036	114	.80	80,396	118
.90	63,827	120	.90	67,865	122	.90	71,972	124	.90	76,178	128	.90	80,543	132

TYCART RESERVOIR
CAPACITY TABLE

1075.0 - 1089.9
Sheet 6 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
75.00	80,690	(140)	76.00	85,200	(154)	81.00	89,870	(158)	86.00	94,640	(161)	87.00	99,500	(164)
.10	80,829	15	.10	85,354	15	.10	90,023	16	.10	94,801	16	.10	[illegible]	[illegible]
.20	80,988	30	.20	85,508	31	.20	90,186	32	.20	94,962	32	.20	99,628	33
.30	81,137	45	.30	85,662	46	.30	90,344	47	.30	95,123	48	.30	99,792	49
.40	81,296	60	.40	85,816	62	.40	90,502	63	.40	95,284	64	.40	100,156	66
.50	81,435	74	.50	85,970	77	.50	90,660	79	.50	95,445	80	.50	100,320	82
.60	81,584	89	.60	86,124	92	.60	90,818	95	.60	95,606	97	.60	100,[illegible]	[illegible]
.70	81,733	104	.70	86,278	108	.70	90,976	111	.70	95,767	113	.70	100,648	115
.80	81,882	119	.80	86,432	123	.80	91,134	126	.80	95,928	129	.80	100,812	131
.90	82,031	134	.90	86,586	140	.90	91,292	142	.90	96,089	145	.90	100,976	148
76.00	82,180	(150)	79.00	86,740	(156)	82.00	91,450	(159)	85.00	96,250	(162)	88.00	101,140	(165)
.10	82,330	15	.10	86,896	16	.10	91,609	16	.10	96,412	16	.10	101,305	16
.20	82,480	30	.20	87,052	31	.20	91,768	32	.20	96,574	32	.20	101,470	33
.30	82,630	45	.30	87,208	47	.30	91,927	48	.30	96,736	49	.30	101,635	50
.40	82,780	60	.40	87,364	62	.40	92,086	64	.40	96,898	65	.40	101,800	66
.50	82,930	75	.50	87,520	78	.50	92,245	80	.50	97,060	81	.50	101,965	82
.60	83,080	90	.60	87,676	94	.60	92,404	95	.60	97,222	97	.60	102,130	98
.70	83,230	105	.70	87,832	109	.70	92,563	111	.70	97,384	113	.70	102,[illegible]	115
.80	83,380	120	.80	87,988	125	.80	92,722	127	.80	97,546	130	.80	102,460	132
.90	83,530	135	.90	88,144	140	.90	92,881	143	.90	97,708	146	.90	102,625	148
77.00	83,680	(152)	80.00	88,300	(157)	83.00	93,040	(160)	86.00	97,870	(163)	89.00	102,790	(166)
.10	83,832	15	.10	88,457	16	.10	93,200	16	.10	98,033	16	.10	102,956	17
.20	83,984	30	.20	88,614	31	.20	93,360	32	.20	98,196	33	.20	103,122	33
.30	84,136	46	.30	88,771	47	.30	93,520	48	.30	98,359	49	.30	103,288	50
.40	84,288	61	.40	88,928	63	.40	93,680	64	.40	98,522	65	.40	103,454	66
.50	84,440	76	.50	89,085	78	.50	93,840	80	.50	98,685	82	.50	103,620	83
.60	84,592	91	.60	89,242	94	.60	94,000	96	.60	98,848	98	.60	103,786	100
.70	84,744	106	.70	89,399	110	.70	94,160	112	.70	99,011	114	.70	103,952	116
.80	84,896	122	.80	89,556	126	.80	94,320	128	.80	99,174	130	.80	104,118	132
.90	85,048	137	.90	89,713	141	.90	94,480	144	.90	99,337	147	.90	104,284	149

TYGART RESERVOIR
CAPACITY TABLE

1090.0 - 1104.9
Sheet 7 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1090.00	104,450	(167)	93.00	109,520	(173)	96.00	114,770	(179)	99.00	120,200	(185)	102.00	125,760	(165)
.10	104,617	17	.10	109,693	17	.10	114,949	18	.10	120,385	18	.10	125,925	15
.20	104,784	33	.20	109,866	35	.20	115,128	36	.20	120,570	37	.20	126,156	38
.30	104,951	50	.30	110,039	52	.30	115,307	54	.30	120,755	56	.30	126,348	56
.40	105,119	67	.40	110,212	66	.40	115,486	72	.40	120,940	74	.40	126,532	72
.50	105,285	84	.50	110,385	86	.50	115,668	90	.50	121,125	92	.50	126,720	94
.60	105,453	100	.60	110,559	104	.60	115,844	107	.60	121,310	111	.60	126,909	113
.70	105,619	117	.70	110,731	121	.70	116,023	125	.70	121,495	130	.70	127,096	132
.80	105,786	134	.80	110,904	138	.80	116,202	143	.80	121,680	148	.80	127,284	150
.90	105,953	150	.90	111,077	156	.90	116,381	161	.90	121,865	166	.90	127,472	169
1091.00	106,120	(169)	94.00	111,259	(175)	97.00	116,560	(181)	100.00	122,050	(186)	103.00	127,660	(169)
.10	106,289	17	.10	111,429	18	.10	116,741	18	.10	122,236	19	.10	127,829	19
.20	106,458	34	.20	111,600	35	.20	116,922	36	.20	122,422	37	.20	128,036	38
.30	106,627	51	.30	111,775	54	.30	117,103	54	.30	122,608	56	.30	128,227	57
.40	106,796	68	.40	111,950	70	.40	117,284	72	.40	122,794	74	.40	128,416	76
.50	106,965	84	.50	112,125	88	.50	117,465	90	.50	122,980	93	.50	128,605	94
.60	107,134	101	.60	112,300	105	.60	117,646	109	.60	123,166	112	.60	128,794	113
.70	107,303	118	.70	112,475	122	.70	117,833	127	.70	123,352	130	.70	128,983	132
.80	107,472	135	.80	112,650	140	.80	118,008	145	.80	123,538	149	.80	129,172	151
.90	107,641	152	.90	112,825	158	.90	118,189	163	.90	123,724	167	.90	129,361	170
1092.00	107,810	(171)	95.00	113,000	(177)	98.00	118,370	(183)	101.00	123,910	(187)	104.00	129,550	(189)
.10	107,981	17	.10	113,177	18	.10	118,553	18	.10	124,097	19	.10	129,740	19
.20	108,152	34	.20	113,354	35	.20	118,736	37	.20	124,284	37	.20	129,930	38
.30	108,323	51	.30	113,531	53	.30	118,919	55	.30	124,471	56	.30	130,120	57
.40	108,494	68	.40	113,708	71	.40	119,102	73	.40	124,658	75	.40	130,310	76
.50	108,665	86	.50	113,885	88	.50	119,285	92	.50	124,845	94	.50	130,500	95
.60	108,836	103	.60	114,062	106	.60	119,468	110	.60	125,032	112	.60	130,690	114
.70	109,007	120	.70	114,239	124	.70	119,651	128	.70	125,219	131	.70	130,880	133
.80	109,178	137	.80	114,416	142	.80	119,834	146	.80	125,406	150	.80	131,070	152
.90	109,346	154	.90	114,593	159	.90	120,017	165	.90	125,593	168	.90	131,260	171

TYGART RESERVOIR
CAPACITY TABLE

1105.0 - 1119.9
Sheet 8 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
.00	131,459	(191)	08.00	137,210	(194)	11.00	143,060	(198)	14.00	149,060	(204)	17.00	155,[illegible]	[illegible]
.10	131,641	19	.10	137,404	19	.10	143,258	20	.10	149,264	20	.10	155,[illegible]	[illegible]
.20	131,832	38	.20	137,598	39	.20	143,456	40	.20	149,468	41	.20	155,684	42
.30	132,023	57	.30	137,792	58	.30	143,654	59	.30	149,672	61	.30	155,894	63
.40	132,214	76	.40	137,988	78	.40	143,852	79	.40	149,876	82	.40	156,104	[illegible]
.50	132,405	96	.50	138,180	97	.50	144,050	99	.50	150,080	102	.50	156,315	[illegible]
.60	132,596	115	.60	138,374	116	.60	144,248	119	.60	150,284	122	.60	156,[illegible]	[illegible]
.70	132,787	134	.70	138,568	136	.70	144,446	138	.70	150,488	143	.70	156,[illegible]	[illegible]
.80	132,978	153	.80	138,762	155	.80	144,644	158	.80	150,692	163	.80	156,[illegible]	[illegible]
.90	133,169	172	.90	138,956	175	.90	144,842	178	.90	150,896	184	.90	157,[illegible]	[illegible]
06.00	133,360	(192)	09.00	139,150	(195)	12.00	145,040	(200)	15.00	151,100	(207)	18.00	157,[illegible]	[illegible]
.10	133,552	19	.10	139,345	20	.10	145,240	20	.10	151,307	21	.10	157,[illegible]	[illegible]
.20	133,744	38	.20	139,540	39	.20	145,440	40	.20	151,514	41	.20	157,[illegible]	43
.30	133,936	58	.30	139,735	58	.30	145,640	60	.30	151,721	62	.30	158,[illegible]	[illegible]
.40	134,128	77	.40	139,930	78	.40	145,840	80	.40	151,928	83	.40	158,[illegible]	[illegible]
.50	134,320	96	.50	140,125	98	.50	146,040	100	.50	152,135	104	.50	158,[illegible]	[illegible]
.60	134,512	115	.60	140,320	117	.60	146,240	120	.60	152,342	124	.60	158,[illegible]	[illegible]
.70	134,704	134	.70	140,515	136	.70	146,440	140	.70	152,549	145	.70	159,[illegible]	[illegible]
.80	134,896	154	.80	140,710	156	.80	146,640	160	.80	152,756	166	.80	159,[illegible]	[illegible]
.90	135,088	173	.90	140,905	176	.90	146,840	180	.90	152,963	186	.90	159,[illegible]	[illegible]
07.00	135,280	(193)	10.00	141,100	(196)	13.00	147,040	(202)	16.00	153,170	(209)	19.00	159,500	[illegible]
.10	135,473	19	.10	141,296	20	.10	147,242	20	.10	153,379	21	.10	159,715	22
.20	135,666	39	.20	141,492	39	.20	147,444	40	.20	153,588	42	.20	159,930	43
.30	135,859	58	.30	141,688	59	.30	147,646	61	.30	153,797	63	.30	160,145	[illegible]
.40	136,052	77	.40	141,884	78	.40	147,848	81	.40	154,006	84	.40	160,360	[illegible]
.50	136,245	96	.50	142,080	98	.50	148,050	101	.50	154,215	105	.50	160,575	[illegible]
.60	136,438	116	.60	142,276	118	.60	148,252	121	.60	154,424	125	.60	160,790	[illegible]
.70	136,631	135	.70	142,472	137	.70	148,454	141	.70	154,633	146	.70	161,005	[illegible]
.80	136,824	154	.80	142,668	157	.80	148,656	162	.80	154,842	167	.80	161,220	[illegible]
.90	137,017	174	.90	142,864	176	.90	148,858	182	.90	155,051	188	.90	161,435	[illegible]

TYGART RESERVOIR
CAPACITY TABLE

1120.0 - 1134.9
Sheet 9 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1120.00	160,650	(216)	1123.00	168,160	(220)	1126.00	174,810	(225)	1129.00	181,610	(229)	1132.00	188,550	(233)
.10	161,866	22	.10	168,389	22	.10	175,035	23	.10	181,839	23	.10	188,787	24
.20	162,082	43	.20	168,600	44	.20	175,260	45	.20	182,068	46	.20	189,024	47
.30	162,298	65	.30	168,820	66	.30	175,485	68	.30	182,297	69	.30	189,261	71
.40	162,514	86	.40	169,040	88	.40	175,710	90	.40	182,526	92	.40	189,498	95
.50	162,730	108	.50	169,260	110	.50	175,935	113	.50	182,755	115	.50	189,735	119
.60	162,946	130	.60	169,480	132	.60	176,160	135	.60	182,984	137	.60	189,972	142
.70	163,162	151	.70	169,700	154	.70	176,385	158	.70	183,213	160	.70	190,209	166
.80	163,378	173	.80	169,920	176	.80	176,610	180	.80	183,442	183	.80	190,446	189
.90	163,594	194	.90	170,140	198	.90	176,835	203	.90	183,671	206	.90	190,683	213
1121.00	163,810	(217)	1124.00	170,360	(222)	1127.00	177,060	(227)	1130.00	183,900	231)	1133.00	190,920	(240)
.10	164,027	22	.10	170,582	22	.10	177,287	23	.10	184,131	23	.10	191,160	24
.20	164,244	43	.20	170,804	44	.20	177,514	45	.20	184,362	46	.20	191,400	48
.30	164,461	65	.30	171,026	67	.30	177,741	68	.30	184,593	69	.30	191,640	72
.40	164,678	87	.40	171,248	89	.40	177,968	91	.40	184,824	92	.40	191,880	96
.50	164,895	108	.50	171,470	111	.50	178,195	114	.50	185,055	116	.50	192,120	120
.60	165,112	130	.60	171,692	133	.60	178,422	136	.60	185,286	139	.60	192,360	144
.70	165,329	152	.70	171,914	155	.70	178,648	159	.70	185,517	162	.70	192,600	168
.80	165,546	174	.80	172,136	178	.80	178,876	182	.80	185,748	185	.80	192,840	192
.90	165,763	195	.90	172,358	200	.90	179,103	204	.90	185,979	208	.90	193,080	216
1122.00	165,980	(218)	1125.00	172,580	(223)	1128.00	179,330	(228)	1131.00	186,210	(234)	1134.00	193,320	(243)
.10	166,198	22	.10	172,803	22	.10	179,558	23	.10	186,444	23	.10	193,563	24
.20	166,416	44	.20	173,026	45	.20	179,786	46	.20	186,678	47	.20	193,806	49
.30	166,634	65	.30	173,249	67	.30	180,014	68	.30	186,912	70	.30	194,049	73
.40	166,852	87	.40	173,472	89	.40	180,242	91	.40	187,146	94	.40	194,292	97
.50	167,070	109	.50	173,695	112	.50	180,470	114	.50	187,380	117	.50	194,535	122
.60	167,288	131	.60	173,918	134	.60	180,698	137	.60	187,614	140	.60	194,778	146
.70	167,506	153	.70	174,141	156	.70	180,926	160	.70	187,848	164	.70	195,021	170
.80	167,724	174	.80	174,364	170	.80	181,154	183	.80	188,082	187	.80	195,264	194
.90	167,942	196	.90	174,587	201	.90	181,382	205	.90	188,316	211	.90	195,507	219

TYGART RESERVOIR
CAPACITY TABLE

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1135.00	195,750	(247)	38.00	203,250	(256)	41.00	211,020	(265)	44.00	219,030	(272)	47.00	227,[illegible]	(278)
.10	195,997	25	.10	203,506	26	.10	211,285	27	.10	219,302	27	.10	227,[illegible]	[illegible]
.20	196,244	49	.20	203,762	51	.20	211,550	53	.20	219,574	54	.20	227,818	96
.30	196,491	74	.30	204,018	77	.30	211,815	80	.30	219,846	82	.30	228,097	84
.40	196,738	99	.40	204,274	102	.40	212,080	106	.40	220,118	109	.40	228,[illegible]	112
.50	196,985	124	.50	204,530	128	.50	212,345	133	.50	220,390	136	.50	228,655	140
.60	197,232	148	.60	204,786	154	.60	212,610	159	.60	220,662	163	.60	228,[illegible]	167
.70	197,479	173	.70	205,042	179	.70	212,875	186	.70	220,934	190	.70	229,213	195
.80	197,726	198	.80	205,298	205	.80	213,140	212	.80	221,206	218	.80	229,[illegible]	223
.90	197,973	222	.90	205,554	220	.90	213,405	239	.90	221,478	245	.90	229,772	251
1136.00	198,220	(250)	39.00	205,810	(259)	42.00	213,670	(267)	45.00	221,750	(274)	48.00	230,050	(281)
.10	198,470	25	.10	206,069	26	.10	213,937	27	.10	222,024	27	.10	230,331	28
.20	198,720	50	.20	206,328	52	.20	214,204	53	.20	222,298	55	.20	230,612	56
.30	198,970	75	.30	206,587	78	.30	214,471	80	.30	222,572	82	.30	230,893	84
.40	199,220	100	.40	206,846	104	.40	214,738	107	.40	222,846	110	.40	231,174	112
.50	199,470	125	.50	207,105	130	.50	215,005	134	.50	223,120	137	.50	231,455	141
.60	199,720	150	.60	207,364	155	.60	215,272	160	.60	223,394	164	.60	231,736	169
.70	199,970	175	.70	207,623	181	.70	215,539	187	.70	223,668	192	.70	232,017	197
.80	200,220	200	.80	207,882	207	.80	215,806	214	.80	223,942	219	.80	232,298	225
.90	200,470	229	.90	208,141	233	.90	216,073	240	.90	224,216	247	.90	232,579	253
1137.00	200,720	(253)	40.00	208,400	(262)	43.00	216,340	(269)	46.00	224,490	(277)	49.00	232,860	(284)
.10	200,973	25	.10	208,662	26	.10	216,609	27	.10	224,767	28	.10	233,144	28
.20	201,226	51	.20	208,924	52	.20	216,878	54	.20	225,044	55	.20	233,428	57
.30	201,479	76	.30	209,186	79	.30	217,147	81	.30	225,321	83	.30	233,712	85
.40	201,732	101	.40	209,448	105	.40	217,416	108	.40	225,598	111	.40	233,996	114
.50	201,985	127	.50	209,710	131	.50	217,685	135	.50	225,875	139	.50	234,280	142
.60	202,238	152	.60	209,972	157	.60	217,954	161	.60	226,152	166	.60	234,564	170
.70	212,491	177	.70	210,234	183	.70	218,223	188	.70	226,429	194	.70	234,848	199
.80	212,744	202	.80	210,496	210	.80	218,492	215	.80	226,706	222	.80	235,132	227
.90	202,997	229	.90	210,758	236	.90	218,761	242	.90	226,983	249	.90	235,416	256

TYGART RESERVOIR
CAPACITY TABLE

1150.0 - 1164.9
Sheet 11 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1150.00	235,700	(267)	53	244,430	(299)	56	253,530	(312)	59	263,010	(324)	62	272,790	(331)
.10	235,987	29	.10	244,729	30	.10	253,842	31	.10	263,334	32	.10	273,121	33
.20	236,274	57	.20	245,028	60	.20	254,154	62	.20	263,658	65	.20	273,452	66
.30	236,561	86	.30	245,327	90	.30	254,466	94	.30	263,982	97	.30	273,763	99
.40	236,848	115	.40	245,626	120	.40	254,778	125	.40	264,308	130	.40	274,114	132
.50	237,135	144	.50	245,925	150	.50	255,090	156	.50	264,630	162	.50	274,445	166
.60	237,422	172	.60	246,224	179	.60	255,402	187	.60	264,954	194	.60	274,776	199
.70	237,709	201	.70	246,523	209	.70	255,714	218	.70	265,278	227	.70	275,107	232
.80	237,996	230	.80	246,822	239	.80	256,026	250	.80	265,602	259	.80	275,438	265
.90	238,283	258	.90	247,121	269	.90	256,338	281	.90	265,926	292	.90	275,769	298
1151.00	238,570	(291)	54 .00	247,420	(303)	57 .00	256,650	(316)	60 .00	266,250	(326)	63 .00	276,100	(334)
.10	238,861	29	.10	247,723	30	.10	256,966	32	.10	266,576	32	.10	276,434	33
.20	239,152	58	.20	248,026	61	.20	257,282	63	.20	266,902	65	.20	276,768	67
.30	239,443	87	.30	248,329	91	.30	257,598	95	.30	267,228	98	.30	277,102	100
.40	239,734	116	.40	248,632	121	.40	257,914	126	.40	267,554	130	.40	277,436	134
.50	240,025	146	.50	248,935	152	.50	258,230	158	.50	267,880	163	.50	277,770	167
.60	240,316	175	.60	249,238	182	.60	258,546	190	.60	268,206	197	.60	278,104	200
.70	240,607	204	.70	249,541	212	.70	258,862	221	.70	268,532	228	.70	278,438	234
.80	240,898	233	.80	249,844	242	.80	259,178	253	.80	268,858	261	.80	278,772	267
.90	241,189	262	.90	250,147	273	.90	259,494	284	.90	269,184	293	.90	279,106	301
1152.00	241,480	(295)	55 .00	250,450	(308)	58 .00	259,810	(320)	61 .00	269,510	(328)	64 .00	279,440	(336)
.10	241,775	30	.10	250,758	31	.10	260,130	32	.10	269,838	33	.10	279,776	34
.20	242,070	59	.20	251,066	64	.20	260,450	64	.20	270,166	66	.20	280,112	67
.30	242,365	89	.30	251,374	92	.30	260,770	96	.30	270,494	98	.30	280,448	101
.40	242,660	118	.40	251,682	123	.40	261,090	128	.40	270,822	131	.40	280,784	134
.50	242,955	148	.50	251,990	154	.50	261,410	160	.50	271,150	164	.50	281,120	168
.60	243,250	177	.60	252,298	185	.60	261,730	192	.60	271,478	197	.60	281,456	202
.70	243,545	207	.70	252,606	216	.70	262,050	224	.70	271,806	230	.70	281,792	235
.80	243,840	236	.80	252,914	246	.80	262,370	256	.80	272,134	262	.80	282,128	269
.90	244,135	266	.90	253,222	277	.90	262,690	288	.90	272,462	295	.90	282,484	302

TYGART RESERVOIR
CAPACITY TABLE

1165.0 - 1179.9
Sheet 12 of 12

Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.	Pool Elev.	Cap. A.F.	Diff. A.F.
1165.00	282,800	(339)	68.00	293,040	(347)	71.00	303,550	(360)	74.00	314,450	(370)	77.00	325,650	(380)
.10	283,139	34	.10	293,387	35	.10	303,910	36	.10	314,820	37	.10	326,030	38
.20	283,478	68	.20	293,734	69	.20	304,270	72	.20	315,190	74	.20	326,410	76
.30	283,817	102	.30	294,081	104	.30	304,630	108	.30	315,560	111	.30	326,790	114
.40	284,156	136	.40	294,428	139	.40	304,990	144	.40	315,930	148	.40	327,170	152
.50	284,495	170	.50	294,775	174	.50	305,350	180	.50	316,300	185	.50	327,550	190
.60	284,834	203	.60	295,122	208	.60	305,710	216	.60	316,670	222	.60	327,930	228
.70	285,173	237	.70	295,469	243	.70	306,070	252	.70	317,040	259	.70	328,310	266
.80	285,512	271	.80	295,816	278	.80	306,430	288	.80	317,410	296	.80	328,690	304
.90	285,851	305	.90	296,163	312	.90	306,790	324	.90	317,780	333	.90	329,070	342
1166.00	286,190	(341)	69.00	296,510	(349)	72.00	307,150	(365)	75.00	318,150	(375)	78.00	329,450	(380)
.10	286,531	34	.10	296,859	35	.10	307,515	37	.10	318,525	38	.10	329,830	38
.20	286,872	68	.20	297,208	70	.20	307,880	73	.20	318,900	75	.20	330,210	76
.30	287,213	102	.30	297,557	105	.30	308,245	110	.30	319,275	113	.30	330,590	114
.40	287,554	136	.40	297,906	140	.40	308,610	146	.40	319,650	150	.40	330,970	152
.50	287,895	171	.50	298,255	175	.50	308,975	183	.50	320,025	188	.50	331,350	190
.60	288,236	205	.60	298,604	209	.60	309,340	219	.60	320,400	225	.60	331,730	228
.70	288,577	239	.70	298,953	244	.70	309,705	256	.70	320,775	263	.70	332,110	266
.80	288,918	273	.80	299,302	279	.80	310,070	292	.80	321,150	300	.80	332,490	304
.90	289,259	307	.90	299,651	314	.90	310,435	329	.90	321525	338	.90	332,870	342
1167.00	289,600	(344)	70.00	300,000	(355)	73.00	310,800	(365)	76.00	321,900	(375)	79.00	333,250	(385)
.10	289,944	34	.10	300,355	36	.10	311,165	37	.10	322,275	38	.10	333,635	39
.20	290,288	69	.20	300,710	71	.20	311,530	73	.20	322,650	75	.20	334,020	77
.30	290,632	103	.30	301,065	107	.30	311,895	110	.30	323,025	113	.30	334,405	116
.40	290,976	138	.40	301,420	142	.40	312,260	146	.40	323,400	150	.40	334,790	154
.50	291,320	172	.50	301,775	178	.50	312,625	183	.50	323,775	188	.50	335,175	193
.60	291,664	206	.60	302,130	213	.60	312,990	219	.60	324,150	225	.60	335,560	231
.70	292,008	241	.70	302,485	249	.70	313,355	256	.70	324,525	263	.70	335,945	270
.80	292,352	275	.80	302,840	284	.80	313,720	292	.80	324,900	300	.80	336,330	308
.90	292,696	310	.90	303,195	320	.90	314,085	329	.90	325,275	338	.90	336,715	347

31. Taking Line. - The taking line for the reservoir was established at elevation 1190, or at the same elevation as the top of the abutment sections.

32. Clearing. - The lake area was cleared to elevation 1099 or 5 feet above maximum low-flow regulation (summer) pool. All material, including living and dead trees, slash, brush, logs, and floatable material, were cleared either by removal from the site or by burning. Brush under 6 feet in height with stems less than 2 inches in diameter, scattered pieces of cut timber, and existing debris not over 6 inches in diameter or 8 feet in length, and most fences were not removed. Between elevation 1099 and 1190 all deadfall, logs, slash, and other large floatable material were removed.

33. Relocations. - Relocations necessitated by the creation of Tygart Lake involved 12.2 miles of the Grafton and Belington Branch of the Baltimore and Ohio Railroad. The relocation required two tunnels, two underpasses, nine local road underpasses and two major bridges.

34. Recreation. - Space is readily available in the vicinity of the dam for such activities as swimming, boating, fishing, camping, picnicking, and sightseeing. There are numerous roads leading into the reservoir area to provide easy access from any direction. The development of recreational facilities and the management of the fish and game resources in the government-owned portion of the area are the responsibility of the State of West Virginia under a long-term license agreement with the Department of the Army. The licensed land, together with the various parcels of the State-owned land adjoining the reservoir

area, have become known as Tygart Lake State Park. Reservoir drawdown curves for wet, normal, and dry years are shown on Plate 11. Table 5 presents totals for individual recreational usages for the years 1965 through 1975.

35. Malaria Control. - Malaria control for the reservoir is believed of minor importance because of remoteness from urban areas and scarcity of any species of the Anopheles mosquito. In addition, due to general operation and maintenance practices of drift and brush removal, no particular problem in regulatory controls has been encountered.

TABLE 5

RECREATIONAL USAGE AT TYGART LAKE

Recreational Use*	Year										
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Fishing	19,198	21,990	27,600	28,180	27,870	31,730	36,410	37,230	40,900	46,780	55,260
Boating	66,729	68,695	74,800	86,090	71,920	95,110	106,880	93,070	97,210	84,510	110,800
Picnicking	131,131	123,120	125,000	142,970	123,070	148,340	162,860	154,890	153,910	149,150	188,630
Swimming	116,115	132,290	141,800	149,450	124,160	133,460	147,400	114,960	110,840	99,880	152,460
Camping	28,113	22,630	29,200	73,000	25,720	35,910	54,870	33,410	39,240	40,830	56,730
Sightseeing	264,913	308,920	295,100	324,040	343,660	486,030	407,480	416,990	422,840	450,600	510,810
Hunting	18,163	21,710	17,200	17,620	19,330	23,070	26,640	27,630	26,240	30,850	30,770
Water Skiing	24,613	--	25,900	29,780	24,750	30,690	35,830	32,650	40,550	29,700	38,320
Total Users	508,651	558,900	559,950	636,400	609,700	747,700	766,780	751,600	758,360	775,160	910,630

* Not all usages are given in this table.

36. Reservoir Stratification. - Man-made lakes in the eastern United States tend to stratify during the warmer half of the year. The temperature of the epilimnion, or upper zone of the lake, is usually close to the average air temperature at the surface and is rich in dissolved oxygen. In the thermocline, or transition zone, there is a rapid decrease in temperature and dissolved oxygen within a few feet of depth. The hypolimnion, or bottom zone, is usually much cooler than the epilimnion, and is low in dissolved oxygen. In this geographic area, lake stratification usually begins in late April or early May. The margine of difference in temperature and dissolved oxygen between the epilimnion and hypolimnion tend to increase throughout the late spring and summer, reaching maximums by late August. The fall "turnover" usually occurs in October, as the epilimnion is cooled by the seasonal drop in air temperature, and achieves the same density as the hypolimnion.

37. Records for Tygart Lake show that the surface water temperature reaches a maximum of about 28° C. (82° F.), during the summer months. The average temperature in the deepest portions of the lake during the period of stratification (May through October) is about 11° C. (52° F.). Solar radiation and day-to-day air temperatures have their maximum effect within the top ten feet of the lake. As water is always discharged from the hypolimnion during the period of stratification, the epilimnion is virtually undisturbed, and does not vary in temperature by more than about five degrees Fahrenheit below the air temperature. During the remainder of the year, when the lake is not stratified, average reservoir water temperature generally follows the seasonal variations in air temperature.

38. Water Quality. - Water samples have been taken of Tygart Lake outflow twice monthly since 1952. The temperature of the water is taken at the time the samples are collected. The samples are then mailed to the Pittsburgh District Office, Hydrology and Hydraulics Branch. Prior to July 1969, these samples were sent to Kelly's Analytical Laboratory, Cheswick, Pennsylvania, for chemical analysis. Since that time water sample analyses have been conducted by the Hydrology and Hydraulics Branch. These consist of tests for pH, acidity (total, mineral, free CO_2), alkalinity (total, carbonates, bicarbonates), turbidity, and hardness. Results of water quality tests taken daily at Fairmont by the Fairmont Water Company are reported to the dam.

39. Each year, during the months of May through October, the Hydrology and Hydraulics Branch periodically makes extensive surveys of water quality in each of the reservoirs in the District. Plate 12 shows the locations of the water quality sampling stations in the Tygart Lake area. Table 6 presents water quality data obtained at these stations during 1973 and 1974.

40. The Tygart River basin contains numerous coal mines, both active and abandoned. Tygart Lake is subject to sudden mine acid flushouts resulting from heavy rainfall over the basin. At times, this acid causes a taste and odor problem in the water which the City of Grafton withdraws from the lake. However, pH values in the reservoir have risen in recent years, and, in many instances, are 7.0 or higher. The reservoir presently supports a wide variety of plant and animal life, including many species of fish.

TABLE 6

TYGART RIVER 1973 AND 1974

Summary Table of Chemical Parameters

Stations	Field pH	Conductivity	Total Acidity as mg/l $CaCO_3$	Total Alkalinity as mg/l $CaCO_3$	Hardness as mg/l $CaCO_3$	Turbidity FTU	Sulfate mg/l	Total Iron mg/l	Manganese mg/l
Inflow									
Tyg 2112									
Maximum	6.7	340	117	6	106	9			
Minimum	3.5	92	4	0	34	0.5			
Mean	4.2	186	51	0.5	64	2.4			
Tyg 1111									
Maximum	7.4	280	82	19	154	27	110	3.6	0.58
Minimum	4.2	57	2	0	26	0.5	12	0.2	0.09
Mean	6.4	143	10	7	66	6	46	1.2	0.21
Tyg 1113									
Maximum	6.9	240	27	16	116	20	70	2.9	0.49
Minimum	4.9	90	6	2	40	1.2	5	1.3	0.12
Mean	5.9	161	15	9	70	12.9	28	2.3	0.25
Tyg 2215									
Maximum	4.6	4700	3857	0	3300	68	3750	1125	25.6
Minimum	3.0	1500	1037	0	730	3.4	270	175	5.7
Mean	3.4	3096	2528	0	1596	30.7	1424	418	16.4
Tyg 2216									
Maximum	7.0	120	10	14	90	10	60	1.1	0.13
Minimum	6.4	80	4	5	28	0.6	18	0.3	0.07
Mean	6.7	104	7	10	54	6.4	35	0.5	0.10

TABLE 6 (Cont.)

Stations	Field pH	Conductivity	Total Acidity as mg/l $CaCO_3$	Total Alkalinity as mg/l $CaCO_3$	Hardness as mg/l $CaCO_3$	Turbidity FTU	Sulfate mg/l	Total Iron mg/l	Manganese mg/l
Tyg 1115									
Maximum	7.0	190	11	22	100	12	90	2.4	0.27
Minimum	5.9	82	3	4	32	0.2	20	0.3	0.06
Mean	6.7	126	6	12	56	4.1	45	1.2	0.15
Tyg 2217									
Maximum	8.4	130	10	13	55	13	30		
Minimum	6.1	68	5	6	23	1.5	9		
Mean	6.9	94	7	9	39	6.6	24		
Tyg 2218									
Maximum	7.7	80	164	10	56	29	22	0.28	0.34
Minimum	5.3	50	3	1	12	0.3	5	0.14	0.12
Mean	6.6	60	29	5	28	6.1	15	0.24	0.20
Tyg 1119									
Maximum	8.0	300	12	26	130	5.8	105	1.5	0.21
Minimum	6.2	100	3	1	35	1	16	0.2	0.13
Mean	6.9	155	7	15	73	3.2	53	0.8	0.16
Outflow									
Tyg 1201									
Maximum	7.3	160	29	12	102	10	46	2.8	0.36
Minimum	5.8	51	2	3	28	1	21	0.2	0.11
Mean	6.6	95	5	7	46	3.4	29	0.6	0.19
Tyg 3006									
Maximum	8.0	150	52	14	72	10	60	0.86	0.31
Minimum	5.7	85	2	1	32	0.4	20	0.13	0.13
Mean	7.0	116	12	8	52	4.2	41	0.36	0.21

TABLE 6 (Cont.)

Stations	pH	Conductivity	Total Acidity mg/l	Total Alkalinity mg/l	Hardness as mg/l $CaCO_3$	Turbidity FTU	Sulfates mg/l	Total Iron at one Meter mg/l *	Total Iron (Benthic) mg/l	Manganese mg/l **
Tyg 1002										
Maximum	7.2	208	30	18	92	17	44	0.6	3.9	2.1
Minimum	5.7	46	1	3	25	0.4	19	L0.1	0.2	L0.02
Mean	6.2	93	5	7	45	3.5	29	0.3	1.1	0.26
Tyg 1003										
Maximum	7.6	185	30	20	100	22				
Minimum	5.1	47	2	3	28	0.4				
Mean	6.3	94	5	7	49	3.8				
Tyg 1004										
Maximum	7.2	160	21	11	94	9.2	56	0.9	1.8	0.23
Minimum	5.5	47	1	2	28	0.4	20	L0.1	0.18	L0.02
Mean	6.4	95	4	6	46	3.3	31	0.18	0.81	0.08
Tyg 1005										
Maximum	7.2	185	10	12	96	40				
Minimum	5.2	47	1	4	26	0.4				
Mean	6.4	93	4	7	48	5				
Tyg 1006										
Maximum	7.3	235	30	12	95	12	64	2.6	2.5	0.39
Minimum	4.8	47	2	2	24	0.5	21	L0.1	0.3	L0.02
Mean	6.4	98	4	7	50	3.9	33	0.46	0.9	0.14

TABLE 6 (Cont.)

Stations	pH	Conductivity	Total Acidity mg/l	Total Alkalinity mg/l	Hardness as mg/l $CaCO_3$	Turbidity FTU	Sulfates mg/l	Total Iron at one Meter mg/l *	Total Iron (Benthic) mg/l	Manganese mg/l **
Tyg 1007										
Maximum	7.0	215	30	18	116	20				
Minimum	4.7	50	1	2	26	0.1				
Mean	6.2	99	5	7	53	4.6				
Tyg 1008										
Maximum	7.6	240	61	14	130	95				
Minimum	4.9	50	1	1	26	0.1				
Mean	6.3	108	7	7	54	5.7				
Tyg 1009										
Maximum	7.4	230	30	17	140	23	74	1.95	1.58	0.6
Minimum	5.9	50	1	3	25	0.5	7	0.11	0.57	0.02
Mean	6.5	116	4	7	57	4.5	38	0.56	1.0	0.18
Tyg 1010										
Maximum	7.3	270	29	19	105	60				
Minimum	4.5	51	1	0	26	0.1				
Mean	6.6	118	6	7	57	6				
Total Lake										
Maximum	7.6	270	61	20	140	95	74	2.6	3.9	2.1
Minimum	4.5	46	1	0	24	0.1	7	L0.1	0.18	L0.02
Mean	6.4	102	5	8	51	4.5	33	0.38	0.95	0.17

L = Less Than

* Samples with a non-detectable concentration of iron were assigned a value of 0.05 mg/l to compute mean.

** Samples with a non-detectable concentration of manganese were assigned a value of 0.01 mgl to compute mean.

41. Tygart River water is generally of satisfactory quality for downstream purposes, and there is no provision for selective withdrawal from the reservoir. However, during periods when the flow in the upper Monongahela River is less than 600 c.f.s., Tygart Lake outflow is adjusted so that the ratio of Tygart to West Fork River contribution to the upper Monongahela River is at least 2:1, thereby serving as a dilutant to the poorer quality West Fork River water.

42. Sediment Ranges. - Forty-six ranges with 68 permanent monuments and markers above elevation 1167 have been established across the reservoir at regular intervals, normal to the main stream valley and the principal tributaries, for use in determining sedimentation in the reservoir. Cross-sections on these ranges have been determined by instrument survey.

43. Three sedimentation surveys have been made since the beginning of full flood control operation of Tygart Dam in June 1938. The first survey was made during October and November 1945, the second survey between November 1958 and March 1959, and the third in 1973. Results of the three surveys showed that the silting which had occurred had been partly counterbalanced by scouring in the upper portions of the lake bed. Locations of the sediment ranges are shown on Plate 13.

44. Flood Damage Districts. - Flood damage along the Monongahela River and the upper Ohio River is divided into eight damage districts: Upper Monongahela District, Middle Monongahela District, McKeesport District, Pittsburgh District, Montgomery District, New Cumberland District, Wheeling District, and Hannibal District. The curves showing direct damage sustained by flooding to various elevations on the respective river gages are presented as Plates 14 through 21, inclusive.

45. Hydrologic Network. - The precipitation and stream flow stations used for regulation of the reservoir, and for any subsequent studies of rainfall and runoff for the reservoir area, are shown on Plate 22. Tables 7 and 8, which follow, present pertinent data for these stations.

46. Snow Survey Course. - A snow survey course has been established for the Pittsburgh District which extends through the Tygart River basin. During periods of heavy snow cover, samples of snow depth and water content are taken at points, near traveled highways, which are representative of the basin with respect to elevation, location, exposure, and vegetal cover. There are nine such points located within the reservoir basin. Snow sampling equipment will be supplied to the dam operators for supplemental checks on rate of increase or decrease in the water content of the snow at a selected sampling station near the dam.

NOTE: The snow sampling points referred to here are part of the District-wide network covered by Hydrology and Hydraulics Branch personnel during a general snow survey. Tygart personnel are not involved in this survey.

TABLE 7

PRECIPITATION STATIONS

Station, W.Va.	County	Approx. Elev.	Records Available From	Records Available To	Type*	Operating Agency**
Alexander	Upshur	1940	Oct 1954	Date	R	CE
Alpena 1 NW	Randolph	3020	Nov 1946	Date	NR	NWS
Belington	Barbour	1679	May 1938	Date	NR	NWS
Buckhannon	Upshur	1420	Aug 1971	Date	NR	CE
Buckhannon 2W	Upshur	1410	1888	1906		NWS
		1445	1908	Date		NWS
Dailey	Randolph	1960	May 1956	Date	NR	NWS
Elkins WB Ap	Randolph	1970	Jan 1899	Date	R	NWS
Fellowsville	Preston	1450	Aug 1954	Date	NR	CE
Hall	Barbour	1369	Sep 1938	Date	NR	NWS
Hutton Knob	Randolph	4000	Dec 1955	Date	R	CE
Kumbrabow State Forest	Randolph	3210	Jun 1942	Date	R	NWS
Philippi	Barbour	1281	Mar 1892	Dec 1918	NR	NWS
			Jan 1920	Date	NR	NWS
Pickens	Randolph	2750	Jan 1939	Date	NR	NWS
Sand Run	Upshur	1650	Jul 1947	Date	R	CE
Tennerton	Upshur	1450	Nov 1956	Aug 1971	NR	CE
Valley Head	Randolph	2425	Jan 1939	Date	NR	NWS

*R = Recorder; NR = Non-Recorder

**CE = Corps of Engineers; NWS = National Weather Service

TABLE 8

STREAM FLOW STATIONS

Stream	Station, W.Va.	Drainage Area	Period of Record From	Period of Record To	Type of Gage *	Minimum Discharge in Period of Record Sec-Ft	Minimum Discharge in Period of Record Date	Maximum Discharge In Period of Record Sec-Ft	Maximum Discharge In Period of Record Date	Operating Agency **
Tygart River	Dailey	187	Apr 1915	Date	R	0	Several days, 1930,1953	13,100	4 Feb 1932	GS
Tygart River (Elkins Local Flood Protection	Inlet Works	270	Mar 1949	Date	NR					CE
	Channel	270	Mar 1949	Date	NR					CE
	Outlet Works	270	Mar 1949	Date	NR					CE
	Water Works	272	Oct 1934	Date	NR					CE
Tygart River	Near Elkins	272	Oct 1944	Date	R,NR	0.1	20-29 Sep 1959	13,100	31 Dec 1969	GS
Roaring Creek	Norton	29.2	Aug 1964	Sep 1969	R	0.1	Several days, 1964,1965	1,750	7 Mar 1967	GS
Grassy Run	Norton	2.86	Aug 1964	Sep 1969	R	0.4	8 Sep, 7 Dec 1965	375	7 Mar 1967	GS
Tygart River	Belington	408	Jun 1907	Date	R	0.1	13 Sep 1930	18,400	25 Jul 1912	GS
Middle Fork R.	Audra	149	Feb 1942	Date	R	0.2	11-27 Oct 1953	11,500	23 Jun 1972	GS
Buckhannon R.	Tennerton	197	Oct 1939		NR					CE
Buckhannon R.	Buckhannon				R					CE
Sand Run	Sand Run	14.5	Oct 1946	Date	R	0	Several days, 1951-56, 1964-66	2,000	25 Jun 1950	GS
Buckhannon R.	Hall	277	Jun 1907	May 1909	NR					GS
			Apr 1915	Date	R	0.2	23,27 Oct 1930	13,000	7 Mar 1967	GS
Tygart River	Philippi	916	Apr 1940	Date	R	4.9	10,11,12,21 Oct 1953	43,000	7 Mar 1967	GS
Tygart River	Carr China (TygartOutflow)	1184	Apr 1935	Date	R	0	2 Aug 1938	21,100	26 Mar 1965	CE
Tygart River	Colfax	1366	May 1939	Date	R	94	3 Jul 1946	22,500	14 Feb 1948	GS
West Fork R.	Enterprise	759	Jun 1907	Sep 1918	NR					GS
			Oct 1932	Date	R	3.4	27 Jul 1934	36,500	7 Mar 1967	GS

* R = Recorder; NR = Non-Recorder

** GS = U. S. Geological Survey; CE = Corps of Engineers

REGULATION SCHEDULE PROCEDURES

47. Scope. - Tygart Dam is operated for flood control, low-flow regulation, and water quality control. Flood control storage is particularly effective in reducing flood stages in the lower Tygart and Monongahela River valleys. Stage reductions are sometimes also significant along the upper Ohio River. Such reductions become of much greater significance during the latter crests of a multiple-peak flood or with the concentration of the flood-producing rain in the southern portion of the Pittsburgh Engineer District. Because of the high percentage of tributary drainage area controlled, virtually all flooding in the 22.7 mile reach along the Tygart River valley to the mouth has been eliminated.

48. Reservoir discharge for low-flow control provides a minimum regulated flow of 340 c.f.s. in the upper Monongahela River above Point Marion under stream conditions similar to those of 1930, the year of record low flow. This insures sufficient flow for uninterrupted navigation conditions in the Monongahela River, where river traffic is of utmost economic importance.

49. Data. - Hydrologic and meteorologic data available for the development, review, and verification of a reservoir operation plan for Tygart Lake are fairly adequate. Discharge records at or near the dam are available since 1907. Stream flow data for a station at Fetterman, four miles downstream from Tygart Dam, commenced in July 1907 and continued until May 1939. From 1907 until October 1932, the data were obtained from daily chain gage readings. From 1932 until May 1939 a

continuous water-stage recorder was in operation. Plates 23-1 to 23-68 present the hydrographs for the years 1908 through 1975. From June 1938 to date, continuous records of reservoir pool elevations have been compiled and inflow and outflow computed. Rating curves have been developed for the slide gates and gate-valves, based on discharge measurements and correlated to the Carr China Company tailwater station 0.7 mile below the dam. Long-term stream flow and precipitation records are also available at various locations throughout the Tygart River basin for studies of distribution of runoff and rainfall for various portions of the drainage area.

LOW FLOW SCHEDULE

50. Controls. - The regulation schedule has been developed primarily to fulfill the minimum requirement of maintaining navigation along the Monongahela River under the most adverse conditions that might reasonably be expected. Using the historic 1930 drought as a criterion, it was determined that sometimes it might be necessary to maintain a constant discharge of 340 c.f.s. from Tygart Lake for the 5-1/2 month period from 1 July to 15 December. This flow, translated into a volume, would be 675 acre-feet per day or 113,400 acre-feet for the 168-day period. The record of the Tygart River during the 1930 drought reveals that although on occasion the discharge was as low as 1 c.f.s. the total volume of discharge from 1 July to 15 December was approximately 13,000 acre-feet. Since the difference between the total volume of required discharge and the minimum expected inflow determines the volume of

storage that must be in the reservoir prior to the low-flow period, the use of 1930 as a criterion would necessitate about 100,000 acre-feet of storage by 1 July.

51. The normal filling rate for the reservoir was determined from mass curves which were plotted for the two-month period preceding 1 May for the years 1908 through 1973. The period from 15 March to 30 April normally produces enough runoff that practically all the flow from the reservoir tributary area could be available for storage retention during this period. Therefore, if the reservoir was at the minimum pool elevation 1010, or 100,000 acre-feet below summer pool on 15 March, the reservoir should be filled to summer pool by 1 May. The storage capacity involved thereby represents a volume equal to 1.58 inches of equivalent runoff from the tributary area, or 100,000 acre-feet capacity available for low-flow augmentation and ample provision for winter flood control purposes.

52. Storage Allocation. - The guide curve for low-flow allocations based on the developed schedule has a summer conservation elevation of 1094 (111,200 acre-feet) to be attained by 1 May of each year. Summer drawdown begins between 1 July and 1 September, depending on the runoff. The storage is drawn down to provide a flood control storage reserve of 256,600 acre-feet by the end of December at elevation 1036.4. During the period from 1 January to 15 March the reservoir pool is further reduced to elevation 1010 except during flood storage periods. This schedule is presented graphically on Plate 10.

53. Scope. - Augmentation from Tygart Lake to meet navigation requirements significantly increases the flow in the Monongahela and upper Ohio River during the five-month period July to November. The index for discharge is at Opekiska Lock and Dam, Opekiska, West Virginia, the station closest to the head of the Monongahela River. Since no stage-discharge relation is available for Opekiska Dam, an estimate of flow must be made based on flow on the Tygart River at Colfax and the West Fork River at Enterprise.

54. Regulation. - Storage and release computations for low-flow regulation of the reservoir were performed in the investigation according to the method of operation discussed in previous paragraphs and presented in the Low-Flow Schedule shown as part of Plate 10. Computations of regulation during floods were made according to the Flood Control Schedule discussed later. The rate of release from the reservoir combined with unregulated flow at Opekiska Lock and Dam was found to be sufficient at all times to provide the flow requirements as indicated by the drawdown-flow relation curve. Whenever feasible during low-flow periods, Tygart outflow is regulated so that the flow at Colfax exceeds that at Enterprise, thereby diluting the acidic West Fork River for water quality improvement at Fairmont, W. Va., and other downstream communities.

55. Results. - The results of the regulation study show the storage condition which would have existed in the reservoir throughout each year of the period. The driest continuous period in the computed operation sequence existed during the summer-autumn of 1930, when approximately 100,000 acre-feet of impounded storage would have been required to carry schedule operations through the drought. Mass curves indicate that storage of this magnitude would have been available prior to the

critical demand period. The summary of the mass curves is shown on Plate 24. A study of historical weather records indicates the period of 1930-1934 probably has been the driest in at least the last 100 years.

FLOOD CONTROL SCHEDULE

56. Controls. - Tygart Lake, situated alone in the upper Monongahela River basin, acts independently of other flood control reservoirs in the Pittsburgh District for flood control on the Monongahela River above McKeesport, Pennsylvania. Below McKeesport, Youghiogheny River Lake helps to reduce flood peaks on the Monongahela River. Kinzua, Tionesta, Union City, Woodcock, East Branch Clarion, Mahoning, Crooked Creek, Conemaugh, and Loyalhanna Reservoirs operate to reduce flooding on the Allegheny River, and combine with Tygart and Youghiogheny River Reservoirs to reduce flooding at Pittsburgh and the upper Ohio River. Berlin, Mosquito Creek, Shenango, and M. J. Kirwan Reservoirs operate to reduce flooding in the Beaver River basin and along the upper Ohio River.

57. Methods. - Since the gross capacity of Tygart Lake is equivalent to only 4.59 inches of runoff, it is not possible to contain the entire runoff from great storms of the type that have occurred over similar drainage basins in the eastern United States. Therefore, a proper balance between outflow and inflow must be maintained if the maximum benefit is to be obtained from the available storage capacity.

Flood control storage is necessarily closely related to incipient inclement meteorological conditions. Due to the relatively long travel time of flow from the dam to the mouth of the Monongahela River, flood conditions must be anticipated. However, due to the limited reservoir capacity, flood storage cannot begin until it will aid in preventing or reducing damage at some downstream point. The outflow is increased as soon as the flood passes and forecasts of stage indicate that an increase in outflow will not arrive at any critical downstream point until the river at that point has receded below damage stage, in concurrence with the travel times listed in Table 9. Releases from storage are continued at or below maximum allowable bankfull rate (18,300 c.f.s.) until recurrence of critical meteorological or river conditions warrant a return to flood storage operations.

58. Since many of the past floods of record in the Upper Ohio River basin are of the double or triple peak variety, wherein one wave rises immediately on the recession of another, the importance of ending flood storage and beginning discharge at the earliest possible moment is obvious. Table 9 shows downriver translation times from Tygart Lake for both flood and low flow.

59. Forecasts. - A total flood runoff estimate is made by using the hydrologic factors currently analyzed on a basin-wide scale, and from determinations of inflow using rate of change of reservoir storage and instantaneous reports of flow in the Tygart River at Philippi, Belington, Elkins, and Dailey, West Virginia. Stage-discharge curves for these points are shown on Plates 25 through 28. Unit hydrographs for reservoir inflow and of the Tygart River at Philippi, Belington, Elkins, and Dailey are shown on Plate 29.

TABLE 9

TRAVEL TIMES FOR TYGART LAKE RELEASES

	Flood Flow Travel Time (hr.)	Low Flow Travel Time (hr.)
Tygart Dam to Opekiska, W. Va., L/D	5	12
" " " Greensboro, Pa., L/D 7	11	30
" " " Charleroi, Pa., L/D 4	20	53
" " " Braddock, Pa., L/D 2	26	69
" " " Dashields, Pa., L/D	30	80
" " " Montgomery, Pa., L/D	34	90
" " " New Cumberland, W. Va., L/D	38	102
" " " Pike Island, W. Va., L/D	45	120
" " " Hannibal, Ohio, L/D	50	135

60. Forecasts of maximum flow are also necessary. These require a constant check for conditions affecting runoff such as snow cover, precipitation, and infiltration capacities. Runoff rates and losses to runoff are determined by analysis of daily observation of precipitation and runoff. Other hydrologic factors which may influence the distribution of rate of flow are considered.

61. Forecasts of weather conditions and rainfall quantities are obtained from the National Weather Service. They are supplemented by the results of a close personal watch of meteorological developments by personnel of the Hydrology and Hydraulics Branch of the Pittsburgh District Office.

62. Daily reports of rainfall and runoff within and contiguous to the basin, and the water content of the snow mantle as determined by snow survey analysis, are used in conjunction with the above to forecast flows in the upper Monongahela River basin.

63. Schedule. - The schedule developed for storage and release of flood flows and excess runoff not used for low-flow regulation are presented later herein as Schedule A, Normal Flow and Flood Storage, and Schedule B, Flood Storage Release.

FLOOD CONTROL REGULATION

64. Scope. - Regulation schedules for the reservoir have been applied to all floods within the runoff period investigated. A review of certain floods throughout the yearly storage cycle is presented in order to illustrate the regulatory potential of the reservoir.

65. Regulation. - Floods occurring in the early part of the winter-spring period in the Monongahela basin were found to occur generally after a period of moderate to low runoff with the reservoir seldom or briefly above the scheduled storage level. Later in the period, flood runoff generally resulted in excess storage with extended periods of time required for a drawdown.

66. The maximum flood peak of record on the Tygart River was on 25 July 1912, with a peak dam site flow of 66,000 second-feet. The computed operations indicate that the maximum pool elevation would have been 1148.9, or 69 percent of summer flood control capacity. The maximum reservoir elevation for the computed operations would have occurred as a result of the 27 October 1937 storm. This flood, although of somewhat lesser peak magnitude than that of July 1912, featured a greater volume of runoff. It is reasonable to assume that the October 1937 storm could have been preceded by antecedent rainfall sufficient to bring the Tygart pool up to summer conservation elevation 1094. Starting from summer pool, this flood would have produced a maximum pool elevation of 1163.6. This elevation of 1163.6 represents a storage of 278,100 acre-feet or 93 percent of summer flood control capacity. These two floods are good examples of the potential summer-type storm. Inflow, outflow, and reservoir pool elevation for the July 1912 and October 1937 floods are shown as Plates 30 and 31, respectively. Plate 32 shows the frequency of reservoir storage.

67. Standard Project Flood. - The standard project flood is defined as one which would be exceeded in magnitude only on rare occasions. It establishes standards of design which provide a high degree of flood protection without regard to economic or other practical limitations. It is about one-half the magnitude of the probable maximum flood.

68. The standard project flood for Tygart Lake was developed in the manner set forth in Civil Engineer Bulletin No. 52-8, Office of the Chief of Engineers, dated 26 March 1952, subject "Standard Project Flood Determinations". On this basis, rainfall would be 11.6 inches in four days, with a maximum intensity of 6.7 inches in six hours. Total losses were computed to be 3.2 inches. The resultant total runoff would be 8.4 inches, with 6.6 inches occurring within a six-hour period. The reservoir was assumed to be at summer pool elevation 1094 at the onset of the flood. The peak inflow for the standard project flood at Tygart Lake would be 181,800 c.f.s. The maximum pool elevation was computed to be 1181.5, or 14.5 feet above full pool, with a peak outflow of 116,100 c.f.s. The peak storage would be 342,800 acre-feet, or 53,200 acre-feet in excess of total storage. The peak inflow, outflow, and storage for the standard project flood are all considerably higher than those for any recorded flood at Tygart Lake. Plate 33 shows graphs of inflow, storage, and release for the standard project flood.

69. Spillway Design Flood. - The spillway design flood was developed from the Probable Maximum Storm as required by Engineer Circular 1110-2-27, 1 August 1966, "Engineering and Design - Policies and Procedures Pertaining to Determination of Spillway Capacities and Freeboard

Allowances for Dams". The critical design flood for the spillway at Tygart Dam would be generated by the Type IV, or decadent tropical storm, occurring in September. The runoff volume for this flood amounts to 17.31 inches, or 1,092,000 acre-feet, with the maximum instantaneous inflow rate of 335,000 c.f.s. A review of the reservoir flood control schedule indicates that, unless the sluice gates were opened fully, the dam would be overtopped even if there were no wave action. If the outflow schedule were modified as follows: when the reservoir is one-half full, and the inflow is 50,000 c.f.s. and increasing, open 1 gate 5 feet every hour to a total of 8 gates open 5 feet; when the reservoir is three-quarters full and the inflow is 100,000 c.f.s. and increasing, open 1 gate fully every hour to a total of 8 gates open fully. This revised schedule would bring the flat pool for the Type IV flood to elevation 1194.2, just at the top of the dam. Maximum coincident waves would reach elevation 1196.0. The maximum combined spillway and conduit outflow would be 316,000 c.f.s., compared to a natural damsite flow of 293,000 c.f.s. This change would not affect the reservoir operation for any recorded floods. The spillway design flood is presented in Plate 34.

70. Reservoir Emptying Time. - As previously stated herein, outlet discharges are limited to bankfull capacity below the reservoir. In addition, post-flood releases from Tygart Lake must be timed so as not to cause recurrent downstream flooding. Assuming average reservoir inflow and average uncontrolled flow below the reservoir during the discharge period, it is estimated that about 6 and 20 days, respectively,

would be required to lower the reservoir from full pool to summer pool, elevation 1094, or to winter pool, elevation 1010.

DISTRICT ORGANIZATION AND PROCEDURES

71. Organization. - There is shown on Plate 35 the general organization chart for the Pittsburgh Engineer District. The Hydrology and Hydraulics Branch of the Engineering Division and the Recreation and Resource Management Branch of the Operations Division are directly concerned with reservoir operations and regulation. An organization chart of these branches is presented as Plate 36. The duties of the Pittsburgh Office units of the Hydrology and Hydraulics Branch and the Recreation and Resource Management Branch with respect to this phase of their regular work activities are as follows: The Hydrology and Hydraulics Branch maintains a constant check on stream flow and meteorological conditions within the Pittsburgh Engineer District, forecasts stream flow for reservoir regulation purposes and Corps of Engineers flood activities, reviews the current status of existing reservoir outflow and storage conditions, determines the effect of reservoir regulation on downstream river stages, and plans the most desirable operations for the reservoir outlet works. The Recreation and Resource Management Branch supervises maintenance of flood control dams and the flood structure personnel who make the actual changes in settings of gates and control works; makes all routine or prearranged communications between the District office and reservoir personnel during normal District duty hours, including collection of hydrologic data. The Hydrology and Hydraulics Branch, during normal District duty hours, conveys

to the Recreation and Resource Management Branch requests for reports outlined within this manual and orders for changes in gate settings. The Hydrology and Hydraulics Branch may, however, under emergency conditions, communicate directly with reservoir personnel to obtain information concerning heavy rainfall or high runoff or to issue orders for gate settings if it is believed that a delay in desirable storage regulation might result by going through normal communication channels.

72. Regulation Functions.

a. Regular Schedule. - Reservoir regulation operations are determined by the Head of the Reservoir Regulation Section, or by an alternate, of the Hydrology and Hydraulics Branch. Several members of this branch perform work on a rotational basis and are familiar with reservoir regulation procedures.

b. Flood Schedule. - During flood periods, the entire Hydrology and Hydraulics Branch functions as a unit on flood control and related operations. Normal operations are laid aside. Work hours may be as many as 16 per day, except during very critical periods when 3 shifts of 8 hours may be employed. Additional Engineering Division personnel are obtained when necessary for collection and tabulation of data and for field work.

c. Reports.

(1) General data on river stages and hydrometeorological conditions are collected from 7 to 8 A.M. and at other hours under special conditions by the National Weather Service at Pittsburgh, Pennsylvania. These data are obtained from the National Weather Service

Office by daily contact by Hydrology and Hydraulics Branch personnel. A report of stages at all the navigation dams is obtained daily from the Operations Division. Special reports of flood stages and excess precipitation are, however, reported by the National Weather Service directly to the Chief of the Hydrology and Hydraulics Branch or the Head of the Reservoir Regulation Section.

(2) River stage and hydrometeorological data in the tributary areas above the flood control dams are collected daily by the flood control dam personnel. During regular work days, these are relayed by radio between 8:15 A.M. and 9:00 A.M. to the Pittsburgh District Office radio operator who prepares three typed copies. One copy is retained by the Recreation and Resource Management Branch (Operations Division) and two copies are retained personally by the Hydrology and Hydraulics Branch, one for its use and one for the National Weather Service. Data collected according to schedule at other times (weekends and holidays) are obtained by radio in the District Office by a member of the Hydrology and Hydraulics Branch. During severe floods when the District Emergency Flood Center is activated, the entire Pittsburgh District Office force is on duty. Radio facilities are placed on an extended operation schedule, and reports are received as during normal work days.

(3) Special after-hours reports are relayed directly by telephone from all flood control dams to a designated employee of the Hydrology and Hydraulics Branch or Recreation and Resource Management Branch in that order. Regular holiday and weekend reports are received by radio between 8:30 A.M. and 9:15 A.M. at the District office by a

designated Hydrology and Hydraulics Branch employee. Any special data collected by this employee are to be relayed to the pertinent Recreation and Resource Management Branch personnel without delay.

d. Orders. - All changes in outflow rates from reservoirs during non-flood periods are determined by the designated Hydrology and Hydraulics Branch employee in c.(3), the Head of the Reservoir Regulation Section of the Hydrology and Hydraulics Branch, or by the Hydrology and Hydraulics Branch Chief. During normal times, orders for all changes are submitted to the Recreation and Resource Management Branch personnel, who in turn relay orders to dam personnel. However, the Chief of the Hydrology and Hydraulics Branch or the Head of the Reservoir Regulation Section, at their discretion during abnormal times, may issue orders directly to the Project Supervisor for initiation of the reporting program for hydrologic data, or for changes in outflow gate settings. The Recreation and Resource Management Branch is to be notified immediately of any such orders. During regular work periods or periods of serious flood stages when emergency radio transmission is available, orders are transmitted by the radio operator on duty, unless transmission is hampered by interference generated by atmospheric disturbances. All orders are transmitted by telephone when radio transmission is not available. During weekends and holidays the designated Hydrology and Hydraulics Branch employee clears the Project Supervisor at 9:00 A.M. for the remainder of the day if there are no operations. If there are any gate operations to be made, he issues orders via District radio center at 10:30 A.M.

73. 24-Hour Flood Alert. - A 24-hour alert is assumed by vigilance after regular work hours of certain designated employees of the Hydrology and Hydraulics Branch who are assigned the duty of obtaining reports from the National Weather Service, from the Recreation and Resource Management Branch, and from the damtenders and river observers. The Hydrology and Hydraulics Branch employees estimate changes in stream flow, keep a close observation of meteorological conditions, determine special operations affecting reservoir outflow and storage, and inform the Recreation and Resource Management Branch of meteorological or hydrologic conditions which may necessitate special vigilance by dam personnel. The whereabouts of other key members of the Hydrology and Hydraulics Branch are known to them in case critical conditions should arise and 24-hour office duty should become necessary.

74. During an emergency a member of the District Office staff of the Recreation-Resource Management Branch will be notified by the Hydrology and Hydraulics employee on duty. Critical flood conditions or special reports will be transmitted over the radio during these times.

75. One reservoir employee must be available between 7:30 A.M. and 4:00 P.M. daily ~~at any time~~ for the receipt of special rainfall reports from observers, for the observation of critical conditions, for emergency duty, and for transmission of special rainfall and stream flow observations to the Hydrology and Hydraulics Branch.

76. A network of river and rainfall stations is maintained by the National Weather Service Office. Special rainfall reports from these stations are sent to this forecasting center when it is in operation

during regular work hours or on special flood duty. All special reports are in turn relayed to the Chief of the Hydrology and Hydraulics Branch or to the Head of the Reservoir Regulation Section.

77. The reporting rainfall and stream flow network stations above each flood control dam report, on special occasions, to the Project Supervisor, or an alternate. The observers have special instructions for making such reports. A copy of these instructions is included later in this manual.

TYGART DAM

78. Organization. - Three regular employees are assigned to the dam. The Project Supervisor and his first assistant reside in dwellings on the Government reservation. It is desirable that at least one of these two employees be available during periods of critical runoff, or that provision be made to supplement his services at any time deemed necessary by him. There are three men scheduled for regular 40-hour per week duty so that there is constant attendance at the dam each day from 7:30 A.M. to 4:00 P.M.

79. Communication Facilities. - Employees at the dam may be contacted at any time by telephone at [redacted]. Radio communications with the dam, Station WUE 320 on FM or [redacted] KHZ sideband, are made daily Monday through Friday during the all-systems broadcast period 8:15 A.M. to 9:00 A.M., and 3:30 to 3:45 P.M., and at other specified request times to the radio operator, Station WUE 3, Pittsburgh District radio center. On Saturdays, Sundays, and holidays, reports are

made in an all-systems broadcast period from 8:30 to 9:15 A.M. to the Hydrology and Hydraulics Branch employee on duty, Station WUE 3, Pittsburgh District radio center. Orders are issued by this employee at 10:30 A.M. on an all-systems broadcast if any gate operations are desired. If there are no operations, the Project Supervisor is cleared at 9:00 A.M. If the data are not obtained by radio reception, the information may be obtained by telephone. Telephone communications from the dam office to Pittsburgh are made during the hours 7:30 A.M. to 4:00 P.M. all days, including Saturdays, Sundays, and holidays, to the following numbers:

(Area Code 412) [redacted]

At all other times when the above numbers cannot be reached [redacted]

80. Emergency Communications. In the event regular communication channels fail, the Project Supervisor or his alternate should exert every effort to obtain all required hydrologic information by other contacts. Strenuous efforts should be made to communicate with the Pittsburgh District Office during any emergency, and should be continued until contact has been successfully established. This might be accomplished by such other means as local commercial or amateur radio stations, or by use of phone service, public or private, in the nearest

area unaffected by communication transmission failure. If telephone communications should fail, the Project Supervisor should broadcast data by radio each hour on the hour regardless of any schedule. The radio receiver should be kept energized at all times and a dam employee should be within hearing distance, if possible, for reception of orders.

81. Regular Reports. - The Project Supervisor or his assistant is to obtain the following data and report it to the Hydrology and Hydraulics Branch:

a. Stream flow and hydrometeorological data of the reporting network for stations presented in Table 10. The data are to be transmitted daily by radio at 8:15-9:00 A.M. and on Saturdays, Sundays, and holidays at 8:30-9:15 A.M.

b. Bi-hourly elevations of reservoir pool as obtained from the pool recorder chart. The 7:00 and 8:00 A.M. elevations are to be transmitted daily by radio on the morning broadcast. Bi-hourly elevations are to be mailed daily or reported by telephone, if requested by the District Office.

c. The temperature of the outflow taken every Monday. This temperature is to be transmitted by radio at 8:15-9:00 A.M.

d. Observations of snow depth and water content of snow at such specified times as deemed advisable by the Hydrology and Hydraulics Branch for determination of changes in snow mantle. Observation to be taken with a snow sampling tube (which will be supplied to the Project Supervisor) in representative area convenient to the dam, as selected by the Hydrology and Hydraulics Branch for control for basin estimates. Data are to be transmitted by radio. Field notes are to be mailed to the Hydrology and Hydraulics Branch.

TABLE 10

HYDROLOGIC REPORTING NETWORK

STATION	STREAM	OBSERVER	ADDRESS	TELEPHONE NO.	TYPE OF REPORT *
Alexander		[redacted]	[redacted]	[redacted]	P
Dailey		Reports to Dam	via Elkins, N.W.S. Airport		P
Elkins Flood Prot. Project	Tygart River	[redacted]	[redacted]	[redacted] (Res)	P & S
Elkins W.B. Airport		National Weather Service			P
Belington	Tygart River	Reports to Dam	via Elkins N.W.S. Airport		P & S
Buckhannon	Buckhannon R.	[redacted]	City Water Treatment Plant Wood Street Buckhannon, W. Va. 26201	[redacted]	P & S
Philippi	Tygart River	[redacted]	[redacted]	[redacted]	P & S
Valley Head		Reports to Dam	via Elkins N.W.S. Airport		P
Pickens		Reports to Dam	via Elkins N.W.S. Airport		P
Fellowsville		[redacted]	[redacted]	[redacted]	P
Carr China	Tygart River	Telemark		From Dam	P & S
Colfax	Tygart River	Telemark		[redacted]	S
Enterprise	West Fork R.	Telemark		[redacted]	S

* P = Precipitation
  S = Stream Gaging

e. Periodic water samples of reservoir outflow are to be taken on the second and fourth Monday of every month. Samples are to be taken in a standard pint size sample bottle in the flowing portion of the stream immediately below the dam. The samples are to be mailed in special containers, on the same day, to the Hydrology and Hydraulics Branch, to insure delivery to Pittsburgh the following day.

82. A map of the Hydrologic Reporting Network of precipitation and stream flow at stations for Tygart Lake regulation purposes is shown on Plate 22. The normal flow of communications in the collection system is indicated by arrows.

83. Extra Reports. - Extra reports may be desired by the Hydrology and Hydraulics Branch for reservoir regulation purposes during periods of critical runoff. At such times, the Hydrology and Hydraulics Branch is to request that the Project Supervisor be instructed to provide them and to inform the observers when such reports should be made to him. After receipt of the reports the Project Supervisor is to relay them to the Hydrology and Hydraulics Branch.

84. Special Reports. - Special reports of stream stage and precipitation made according to the special observer instructions are to be forwarded, immediately after their receipt by the Project Supervisor, to the Hydrology and Hydraulics Branch. The following instructions, titled "Special Reports of Precipitation", have been issued to all network observers for use in reporting precipitation. The Project Supervisor is to follow the same instructions, except that he is to report as directed under Paragraph 79, Communication Facilities. Stream flow observers are

instructed to make special reports at any time when streams are higher than bankfull. The Project Supervisor shall be responsible for notification of the public and officials of downstream communities whenever unusually high releases are to be made.

85. Special Reports of Precipitation. - Special reports by observers are to be made by calling the dam collect.

1 November through 31 May:

IF: Three-quarters (0.75) of an inch or over of rain is measured and reported at 7:00 A.M. and if rain continues or occurs again, make extra reports at 1:00 P.M., 7:00 P.M., and 1:00 A.M.

IF: Less than three-quarters (0.75) of an inch of rain is reported at 7:00 A.M. but rain continues or begins during the day, make extra reports at the regular times (1:00 P.M., 7:00 P.M., and 1:00 A.M.), after at least one (1.0) inch has accumulated in the rain gage.

IF: Rain begins less than 24 hours after the last report of a storm of more than three-quarters (0.75) of an inch of rain, start extra reports again just as though the extra reports had not stopped.

1 June through 31 October:

IF: One (1.0) inch or over of rain is measured and reported at 7:00 A.M. and if rain continues or occurs again, make extra reports at 1:00 P.M., 7:00 P.M., and 1:00 A.M.

IF: Less than one (1.0) inch of rain is reported at 7:00 A.M., but rain continues or begins during the day, make extra reports at regular times (1:00 P.M., 7:00 P.M., and 1:00 A.M.) after at least one and one-half (1.5) inches have accumulated in the rain gage.

All Year:

IF: Two (2.0) inches or more of rain falls since the last observation, report immediately.

In the event it is impossible for the observer to make contact with Tygart Dam, special reports are to be phoned to one of the Pittsburgh, Pennsylvania, telephone numbers listed in Paragraph 79. Telephone charges are to be reversed.

86. 24-Hour Alert. - The Project Supervisor, besides making special observations of precipitation as outlined under "Special Reports of Precipitation", shall make inquiry concerning any excessive precipitation or flooding of which he may become aware in the upper Monongahela River basin or surrounding areas and make an immediate report to Pittsburgh as previously designated. The Project Supervisor at all times must be alert of weather and runoff conditions and of storage and outflow when any change from current normal in the reservoir elevation or outflow rates becomes apparent. He also must be constantly alert to the physical aspects of the operations structure and make immediate report of any adverse factors affecting the operation of outlet facilities or of control equipment. When critical storm or flood conditions are forecast for the area the Project Supervisor will be forewarned by the District Office.

87. Emergency Regulations. - During any emergency the Project Supervisor is to make necessary arrangements to assure constant attendance at the dam. He shall assume particular reservoir regulatory responsibilities under any or all of the conditions presented in the following schedule*:

EMERGENCY REGULATION SCHEDULE

Controls:

A. Tygart River at Philippi at 5.0 feet and rising.

B. Tygart River at Philippi at 22.6 feet and rising.

C. Monongahela River at Opekiska Lock and Dam, lower gage, at 10.7 feet and rising.

D. Monongahela River at Opekiska Lock and Dam, lower gage crested and falling.

E. Reservoir pool below schedule guideline.

F. Reservoir pool above schedule guideline.

G. Reservoir pool above elevation 1136.

H. Reservoir storage on schedule guideline within 24 hours.

I. Rainfall of sufficient amount to cause a sizable increase in stage along the Monongahela River.

* The gate numbering system is shown in Exhibit 1.

Duties:

a. If and when Conditions (A) or (C) exist, obtain gage readings for Tygart River at Dailey, Elkins, Belington, and Philippi, W. Va., Buckhannon River at Buckhannon, W. Va., and such other hydrologic and reservoir stage data as may then be readily available.

b. After fulfilling Duty (a) to maximum possible extent, make immediate contact with Pittsburgh in the designated manner to submit the data collected and to receive instructions. Consult Charts A and B (Plates 37 and 38) every hour to determine reservoir outflow and inflow.

c. If unable to make proper contact with Pittsburgh within two hours, and if and when Philippi river stage is above 6 feet and rising, go to duties (d) or (e).

d. If condition (E) exists, set Gate No. 5 at 5 feet. After 4 hours, go to duty (e) or (f).

e. If condition (F) exists, set slide gates Nos. 5 and 7 at 5 feet. After 4 hours, go to (f) or (g).

f. If conditions (B) and (G) exist, set 8 slide gates at 5 feet at the rate of 3 gates every 4 hours. If the inflow rate increases to an estimated 100,000 c.f.s. with the reservoir above elevation 1152, set 8 slide gates fully open at the rate of 3 gates every 4 hours.

g. When condition (D) exists, open to just less than maximum reservoir inflow but not greater than 18,300 c.f.s. at the rate of 3 slide gates opened 5 feet every 4 hours. After 4 hours go to (h) or (i).

h. When condition (E) exists, close 3 slide gates every 3 hours until gate setting in effect prior to the emergency is achieved.

i. When condition (I) exists, close 3 slide gates every 3 hours until 2 slide gates remain open 5 feet.

NOTE: Outlet works are to remain in operation during the periods that surcharge-storage water goes over the spillway.

88. The above instructions shall apply only so long as it is impossible to make proper contact with the Pittsburgh Office.

TYGART LAKE

Schedule A (Normal Flow and Flood Storage)

Conditions:

(A) Tygart River at Philippi below 5 feet.

(B) Tygart River at Philippi above 5 feet.

(C) Monongahela River at Opekiska (lower) below 10.7 feet.

(D) Monongahela River at Opekiska (lower) above 10.7 feet.

(E) Reservoir pool above upper storage guide curve.

(F) Reservoir pool below upper storage guide curve.

(G) Ohio River at Pittsburgh predicted to crest below 20 feet.

(H) Ohio River at Pittsburgh predicted to crest above 20 feet.

(I) Reservoir pool above elevation 1136 and reservoir inflow above 50,000 c.f.s. and increasing.

(J) Reservoir pool above elevation 1152 and reservoir inflow above 100,000 c.f.s. and increasing.

Operations:

a. Conditions (A), (C), (F) and (G) - Follow low-flow schedule.

b. Conditions (B), (D), or (H) - Set 2 slide gates at 5.0 feet open and go to Schedule B (Flood Storage Release).

c. Condition (E) - go to Schedule B.

d. Condition (I) - go to 8 slide gates open 5 feet at the rate of 3 slide gates open 5 feet every 4 hours.

e. Condition (J) - go to 8 slide gates open fully at the rate of 3 slide gates open 5 feet every 4 hours.

TYGART LAKE

Schedule B (Flood Storage Release)

Conditions:

(A) Monongahela at Opekiska has crested, (lower gage) below 13.2 (10,000 c.f.s.) and falling.

(B) Ohio River at Pittsburgh has crested or will crest within 8 hours, predicted stage to be below 24.0 (200,000 c.f.s.) within 24 hours and falling.

(C) Rainfall of sufficient amount has occurred or is anticipated to occur to cause a return of flood conditions.

(D) Reservoir storage on schedule guide curve within 24 hours.

Operations:

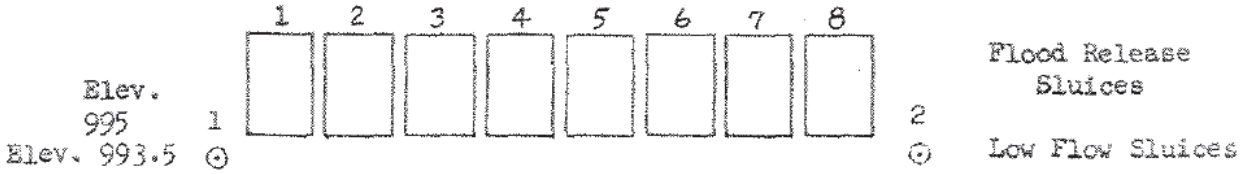
a. When both conditions (A) and (B) occur, consult Charts A and B to determine outflow and inflow. Open additional slide gates to 5.0 feet open, a maximum of 4 gates every 4 hours such that: Peak outflow does not exceed 18,300 second-feet (bankfull) or peak inflow, and increased outflow does not cause a recurring flood condition.

NOTE: If additional outflow is required beyond capacity of all 8 gates open 5.0 feet, make additional increases by further opening gates fully in 4-hour intervals.

EXHIBIT 1

GATE NUMBERING SYSTEM

Looking downstream the gates are numbered as shown:



TYGART LAKE

PROJECT SUPERVISOR'S REGULATION MANUAL

APPENDIX A

TABLE OF CONTENTS

TYGART LAKE

PROJECT SUPERVISOR'S REGULATION MANUAL

A manual outlining the duties and methods for:

a. Collection of hydrologic data in the Tygart River basin above the dam.

b. Regulation of storage and release from reservoir.

APPENDIX A

TYGART LAKE

PROJECT SUPERVISOR'S REGULATION MANUAL

TYGART LAKE

PROJECT SUPERVISOR'S REGULATION MANUAL

1. CONSTANT VIGILANCE must be maintained during any emergency or period of critical runoff.

a. The dam operator must know when there exist:

(1) Critical conditions of storage, rainfall, or runoff in the reservoir basin or in neighboring areas.

(2) Flooding at Dailey, Elkins, Belington, Buckhannon, or Philippi.

(3) Failure or improper operation of gages or outlet works at the dam.

b. The dam operator must immediately notify the Pittsburgh Office of any or all of the above conditions.

2. HOURS OF DUTY

7:30 A.M. to 4:00 P.M. each day at least one dam operator must be on duty within call at or near the dam.

3. DUTIES

a. Regular:

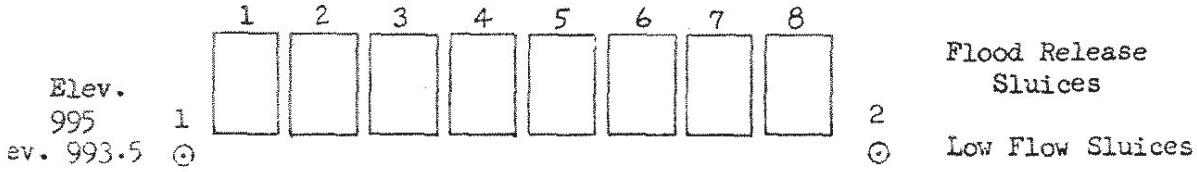
(1) Check pool elevation and rate of change in reservoir elevations morning and afternoon and more frequently if it is believed that special reports may be required or emergency regulation conditions may occur.

(2) Make changes in gate settings as directed. (The gate numbering system is shown in Exhibit 1.)

EXHIBIT 1

GATE NUMBERING SYSTEM

Looking downstream the gates are numbered as shown:



(3) Check all gate settings and outflow gage at least once daily and always after change in gate settings to assure proper release.

(4) If recording gages do not seem to be operating correctly, check on staff or tape gages.

(5) Collect daily hydrologic data and assemble gage readers' report.

(6) Make routine daily reports of reservoir elevation and hydrologic data.

b. Special:

(1) Collect extra and special hydrologic reports.

(2) Report to Pittsburgh immediately all extraordinary hydrologic data or conditions affecting regulation or operation of structures.

(3) Follow emergency regulations.

4. COMMUNICATION PROGRAM FOR THE DAM

Radio Station WUE 320, [redacted] KHZ sideband, and FM.

Telephone: Grafton, West Virginia, [redacted].

a. Radio:

(1) Monday through Friday, all-reservoir system radio broadcast to WUE 3, Pittsburgh, Pennsylvania.

8:15 A.M. to 9:00 A.M.

11:00 A.M. to 11:15 A.M. (if not cleared at 9:00 A.M.)

3:30 P.M. to 3:45 P.M.

Any other time -- by request.

(2) Saturdays, Sundays, holidays to WUE 3

8:30 A.M. to 9:15 A.M.

Any other time -- by request

b. Telephone to Pittsburgh Office:

(1) Every Day, including Saturdays, Sundays and holidays

7:30 A.M. to 4:00 P.M. [redacted]

(2) All other times: The above numbers if it is believed that the Pittsburgh Office force is on duty due to flood or emergency conditions, or to the homes of the following in this order: [redacted]

c. Emergency Communications: In the event regular communication channels fail, the Project Supervisor or his alternate should make an effort to obtain all required hydrologic information by other contacts. Strenuous efforts are to be made to communicate with the Pittsburgh District Office and are to be continued until successful. This might be accomplished through local commercial or amateur radio stations, by telegraph, or by use of other phone service, public or private, in the nearest area unaffected by communication transmission failure. If telephone communication fails, each hour on the hour broadcast data on radio regardless of any schedule. Under such conditions, the radio should be kept energized at all times and dam operator should remain within hearing distance, if possible, for receipt of orders.

5. COLLECTION OF HYDROLOGIC DATA

Telephone to all observers

a. Regular - daily:

7:30 A.M. to 8:00 A.M.

b. Other:

(1) By request from Pittsburgh Office.

(2) According to Extra or Special Report Schedule.

(3) Anytime precipitation or runoff conditions may seem critical.

6. REPORTS

a. Regular Reports - To be transmitted as indicated.

(1) Stream flow and hydrometeorological data for the reporting network of stations presented in Exhibit 2. The data are to be transmitted daily by radio on the first broadcast.

(2) Bi-hourly elevations of reservoir pool as obtained from the pool recorder chart. The 7:00 and 8:00 A.M. elevations to be transmitted daily by radio on the first broadcast. The bi-hourly elevations are to be mailed daily and are to be reported by phone if requested by the Hydrology and Hydraulics Branch.

(3) Observations of snow depth and water content of snow at such specific times as deemed advisable by the District Office for determination of change in snow cover. Observations are to be taken with a (which will be supplied to the Project Supervisor) snow sampling tube in representative area convenient to the dam, as previously selected by the Hydrology and Hydraulics Branch. Data are to be transmitted by radio. Field notes are to be mailed to the District Office.

HYDROLOGIC REPORTING NETWORK

STATION	STREAM	OBSERVER	ADDRESS	TELEPHONE NO.	TYPE OF REPORT *
Alexander		[redacted]	[redacted]	[redacted]	P
Dailey		Reports to Dam	via Elkins, N.W.S. Airport		P
Elkins Flood Prot. Project	Tygart River	[redacted]	[redacted]	[redacted] (Res)	P & S
Elkins W.B. Airport		National Weather Service			P
Belington	Tygart River	Reports to Dam	via Elkins N.W.S. Airport		P & S
Buckhannon	Buckhannon R.	[redacted]	City Water Treatment Plant Wood Street Buckhannon, W. Va. 26201	[redacted]	P & S
Philippi	Tygart River	[redacted]	[redacted]	[redacted]	P & S
Valley Head		Reports to Dam	via Elkins N.W.S. Airport		P
Pickens		Reports to Dam	via Elkins N.W.S. Airport		P
Fellowsville		[redacted]	[redacted]	[redacted]	P
Carr China	Tygart River	Telemark		From Dam	P & S
Colfax	Tygart River	Telemark		[redacted]	S
Enterprise	West Fork R.	Telemark			S

* P = Precipitation
S = Stream Gaging

(4) Periodic water samples of reservoir inflow are to be taken as directed by the District Office. Samples are to be taken in a standard pint-size sample bottle in the flowing portion of the stream at inflow points as previously selected by the Hydrology and Hydraulics Branch and at a point immediately below the dam. The samples are to be mailed in a special container, on the same day taken, to the Hydrology and Hydraulics Branch to insure their being received in Pittsburgh the following day.

b. Extra Reports:

(1) By request of Pittsburgh Office during periods of critical runoff.

(2) At the judgment of the Project Supervisor.

(3) Relay to Recreation and Resource Management Branch or Hydrology and Hydraulics Branch, if and when so directed.

c. Special Reports: - (According to Special Observer Instructions).

(1) By dam operator or observers when limiting values of river stage and precipitation in Paragraph 82, Special Reports of Precipitation, are reached.

(2) By Project Supervisor according to Emergency Regulation Schedule Controls.

(3) Relay to Pittsburgh immediately according to telephone communication program. (Or other available means if telephone communications fail.)

7. EMERGENCY REGULATION

a. The dam operator is to assume emergency responsibilities under the following conditions:

(1) When it is impossible to obtain orders from the Pittsburgh Office within the time specified in emergency regulation schedule.

(2) When conditions of rainfall or runoff have occurred which may endanger the dam structure or downstream communities before orders can be received from Pittsburgh.

b. Emergency duties are as follows:

(1) The Project Supervisor or an assistant is to establish 24-hour attendance at the dam.

(2) Assemble and analyze as much hydrologic data as possible.

(3) Make every effort to contact Pittsburgh Office personnel and continue to do so by any means possible, until successful.

(4) Comply with the following Emergency Schedule if Pittsburgh cannot be contacted.

8. EMERGENCY REGULATION SCHEDULE

Conditions:

(A) Tygart River at Philippi above 5.0 feet and rising.

(B) Tygart River at Philippi above 22.6 feet and rising.

(C) Monongahela River at Opekiska (lower gage) above 10.7 feet and rising.

(D) Monongahela River at Opekiska (lower gage) crested and falling.

(E) Reservoir pool below elevation 1094.

(F) Reservoir pool between elevations 1094 and 1136.

(G) Reservoir pool above elevation 1136.

(H) Reservoir pool projected to fall to elevation 1094 within 24 hours.

(I) Rainfall of 1.0 inch or more within 24 hours, and a stage of 5.0 feet at Philippi or 10.7 at Opekiska (lower gage).

Duties:

a. If and when Conditions (A) or (C) exist, obtain gage readings for the Tygart River at Dailey, Elkins, Belington, and Philippi, for the Buckhannon River at Buckhannon, and such other hydrologic and reservoir stage data as may then be readily available.

b. After fulfilling Duty (a) to the maximum possible extent, make an immediate attempt to contact Pittsburgh in the designated manner so as to submit the data collected and to receive instructions. Consult Charts A and B every hour to determine reservoir outflow and inflow.

c. If unable to make proper contact with Pittsburgh within two hours, and if and when Philippi stage is about 6.0 feet and rising, go to Duties (d) or (e).

d. If Condition (E) exists, set Gate No. 5 at 5 feet. After 4 hours go to Duty (e) or (f). If Condition (F) exists, set Gates Nos. 5 and 7 at 5 feet each. After 4 hours go to Duties (f) or (g).

e. If Condition (F) exists, set Gates Nos. 5 and 7 at 5 feet each. After 4 hours, go to Duties (f) or (g).

f. If Conditions (B) and (G) exist, set all 8 slide gates at 5 feet each, at the rate of 1 gate every hour. If the rate of rise in the pool continues to increase to 2.8 feet or more per hour at an elevation of 1152 or higher, set all 8 slide gates fully open at the rate of 1 gate every hour.

g. When Condition (D) exists, determine the maximum rate of inflow by means of the curves in Chart A. From Chart B determine the gate setting which will pass an outflow just under the maximum inflow but not to exceed 18,300 cubic feet per second. The order of gate openings (to 5 feet each) is as follows: Nos. 5, 7, 2, 4, 1, 8, 6, and 3. If, after all 8 gates are open 5 feet, additional outflow is desired, open Gates Nos. 5, 7, 2, and 4 fully in that order. Openings are to be made at the rate of 3 slide gates opened 5 feet every 4 hours. After 4 hours go to Duties (h) or (i).

h. When Condition (H) exists, close 3 slide gates every 3 hours until gate setting in effect prior to the emergency is achieved (gates are to be closed in reverse order to their opening).

i. When Condition (I) exists, close 3 slide gates every 3 hours until only Nos. 5 and 7 slide gates are open 5 feet each.

9. The above instructions apply only so long as it is impossible to make proper contact with the Pittsburgh District Office, Hydrology and Hydraulics Branch or Recreation and Resource Management Branch. Copies of Charts A and B are to be displayed at all times in the reservoir office.

EXHIBIT 3

INSTRUCTIONS TO OBSERVERS

Special Reports of Precipitation - Special reports are to be made to Tygart Dam, [redacted], or [redacted] (home), when precipitation occurs as follows:

1 November through 31 May:

IF: Three-quarters (0.75) of an inch or over of rain is measured and reported at 7:00 A.M. and if rain continues or occurs again, make extra reports at 1:00 P.M., 7:00 P.M., and 1:00 A.M.

IF: Less than three-quarters (0.75) of an inch of rain is reported at 7:00 A.M. but rain continues or begins during the day, make extra reports at the regular times (1:00 P.M., 7:00 P.M., and 1:00 A.M.), after at least one (1.0) inch has accumulated in the rain gage.

IF: Rain begins less than 24 hours after the last report of a storm of more than three-quarters (0.75) of an inch of rain, start extra reports again just as though the extra reports had not stopped.

1 June through 31 October:

IF: One (1.0) inch or over of rain is measured and reported at 7:00 A.M., and if rain continues or occurs again, make extra reports at 1:00 P.M., 7:00 P.M., and 1:00 A.M.

IF: Less than one (1.0) inch of rain is reported at 7:00 A.M., but rain continues or begins during the day, make extra

EXHIBIT 3 (Continued)

reports at regular times (1:00 P.M., 7:00 P.M., and 1:00 A.M.), after at least one and one-half (1.5) inches have accumulated in the rain gage.

All Year:

IF: Two (2.0) inches or more of rain falls since the last observation, report immediately.


Pittsburgh District
Civil Works Projects
US Army Corps of Engineers
Pittsburgh District
Locks and Dams
Reservoirs
Local Protection Projects (LPP)
Lake Erie
BUFFALO DISTRICT
BALTIMORE DISTRICT
HUNTINGTON DISTRICT
NORFOLK DISTRICT
Erie
Cleveland
Akron
Canton
Youngstown
Warren
Meadville
Jamestown
Salamanca
Olean
Bradford
Oil City
New Castle
Butler
Kittanning
Indiana
Johnstown
Greensburg
Uniontown
Connellsville
Washington
Wheeling
Steubenville
Moundsville
Marietta
Fairmont
Clarksburg
Morgantown
Elkins
Pittsburgh
Mosquito Creek Lake
M.J. Kirwan Dam & Reservoir
Berlin Lake
Shenango River Lake
Woodcock Creek Lake
Union City Dam
Kinzua Dam & Allegheny Reservoir
Tionesta Lake
East Branch Clarion River Lake
Mahoning Creek Lake
Crooked Creek Lake
Conemaugh River Lake
Loyalhanna Lake
Youghiogheny River Lake
Tygart Lake
Stonewall Jackson Lake
L/D 9
L/D 8
L/D 7
L/D 6
L/D 5
L/D 4
L/D 2
L/D 2 (Braddock)
L/D 3 (Elizabeth)
L/D 4 (Charleroi)
C.W. Bill Young L/D
Montgomery L/D
New Cumberland L/D
Dashields L/D
Emsworth L/D
Pike Island L/D
Hannibal L/D
Maxwell L/D
Grays Landing L/D
Point Marion L/D
Morgantown L/D
Opekiska L/D
Hildebrand L/D
Ohio River
Allegheny River
Monongahela River
Youghiogheny River
West Virginia
Pennsylvania
Maryland
New York
Legend
Lock and Dam (L/D)
Federal LPP
Non-Federal LPP
Reservoir
Other Lake or Reservoir
Reservoir Drainage Basin
County
State
USACE District Boundary
NORTH
0 10 20 40 Mi
Data Sources: USGS, USACE
Map Date: May 2019
USACE Pittsburgh Geospatial, 412-395-7553

PLATE 1

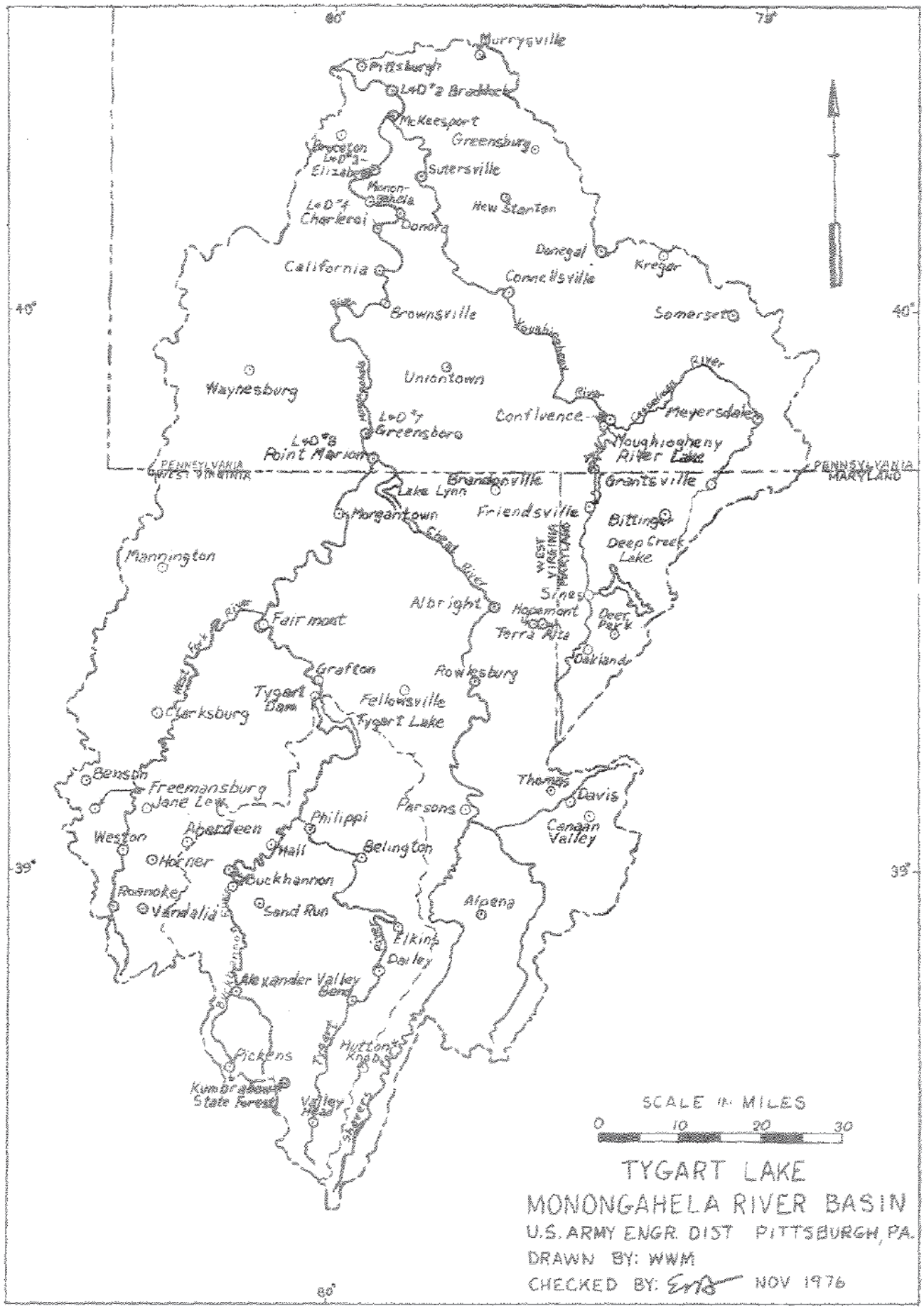

80°
75°
40°
39°
Murrysville
Pittsburgh
L&D 2 Braddock
McKeesport
Greensburg
Lock & Dam 3 Elizabeth
Sutersville
Monongahela
New Stanton
L&D 4 Charleroi
Donora
Donegal
Kregar
California
Connellsville
Brownsville
Somerset
Youghiogheny River
Waynesburg
Uniontown
Monongahela River
Confluence
Meyersdale
L&D 7 Greensboro
L&D 8 Point Marion
Youghiogheny River Lake
PENNSYLVANIA
WEST VIRGINIA
Brandonville
Grantsville
PENNSYLVANIA
MARYLAND
Lake Lynn
Morgantown
Friendsville
Bittinger
Deep Creek Lake
Monongahela River
Manningston
WEST VIRGINIA
MARYLAND
Albright
Sines
Hopemont
Terra Alta
Deer Park
Fairmont
West Fork River
Oakland
Grafton
Rowlesburg
Tygart Dam
Fellowsville
Tygart Lake
Clarksburg
Benson
Freemansburg
Jane Lew
Thomas
Davis
Parsons
Philippi
Canaan Valley
Aberdeen
Weston
Hall
Belington
Hacker
Buckhannon
Roanoke
Vandalia
Sand Run
Alpena
Elkins
Dailey
Alexander
Valley Bend
Pickens
Hutton Knob
Kumbrabow State Forest
Valley Head
SCALE IN MILES
0
10
20
30
TYGART LAKE
MONONGAHELA RIVER BASIN
U.S. ARMY ENGR. DIST PITTSBURGH, PA.
DRAWN BY: WWM
CHECKED BY: EMB NOV 1976

PLATE 2

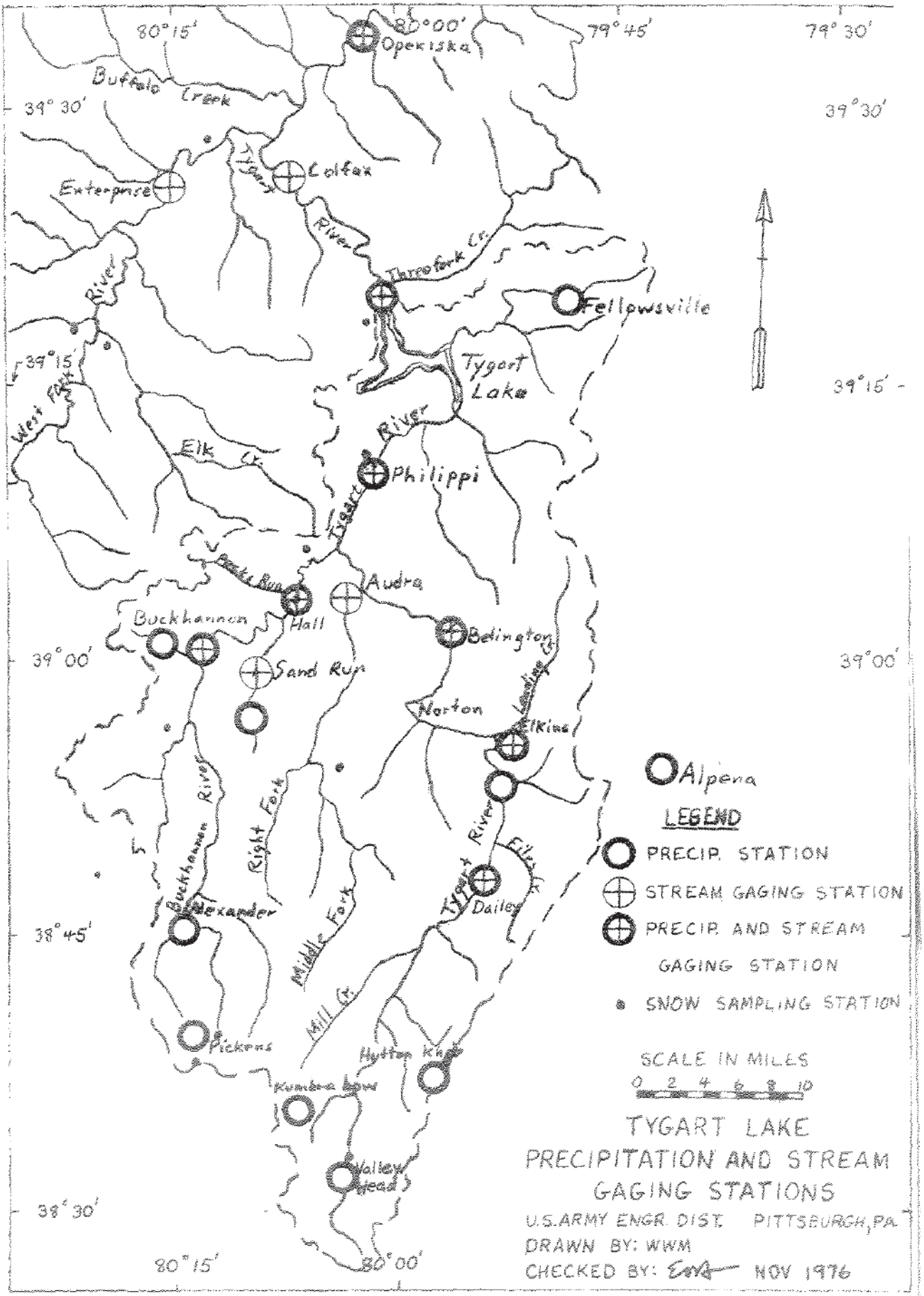
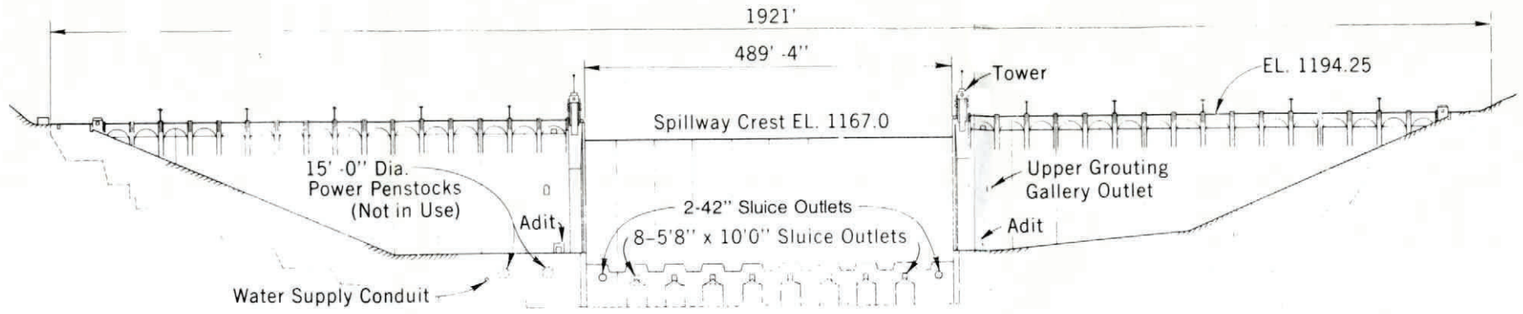
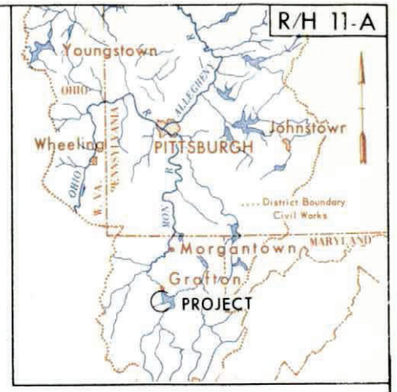

80°15'
80°00'
79°45'
79°30'
39°30'
39°15'
39°00'
38°45'
38°30'
Opekiska
Buffalo Creek
Enterprise
Leading Creek
Colfax
Three Fork Cr.
Fellowsville
West Fork River
Tygart Lake
Elk Cr.
Tygart River
Philippi
Pringle Run
Audra
Hall
Buckhannon
Belington
Sand Run
Norton
Landing Cr.
Elkins
Buckhannon River
Right Fork
Middle Fork
Tygart River
Files Cr.
Alexander
Dailey
Mill Cr.
Pickens
Huston Knob
Kumbrabow
Valley Head
Alpena
LEGEND
PRECIP. STATION
STREAM GAGING STATION
PRECIP. AND STREAM GAGING STATION
SNOW SAMPLING STATION
SCALE IN MILES
0 2 4 6 8 10
TYGART LAKE
PRECIPITATION AND STREAM GAGING STATIONS
U.S. ARMY ENGR. DIST. PITTSBURGH, PA.
DRAWN BY: WWM
CHECKED BY: NOV 1976

PLATE 3



DOWNSTREAM ELEVATION

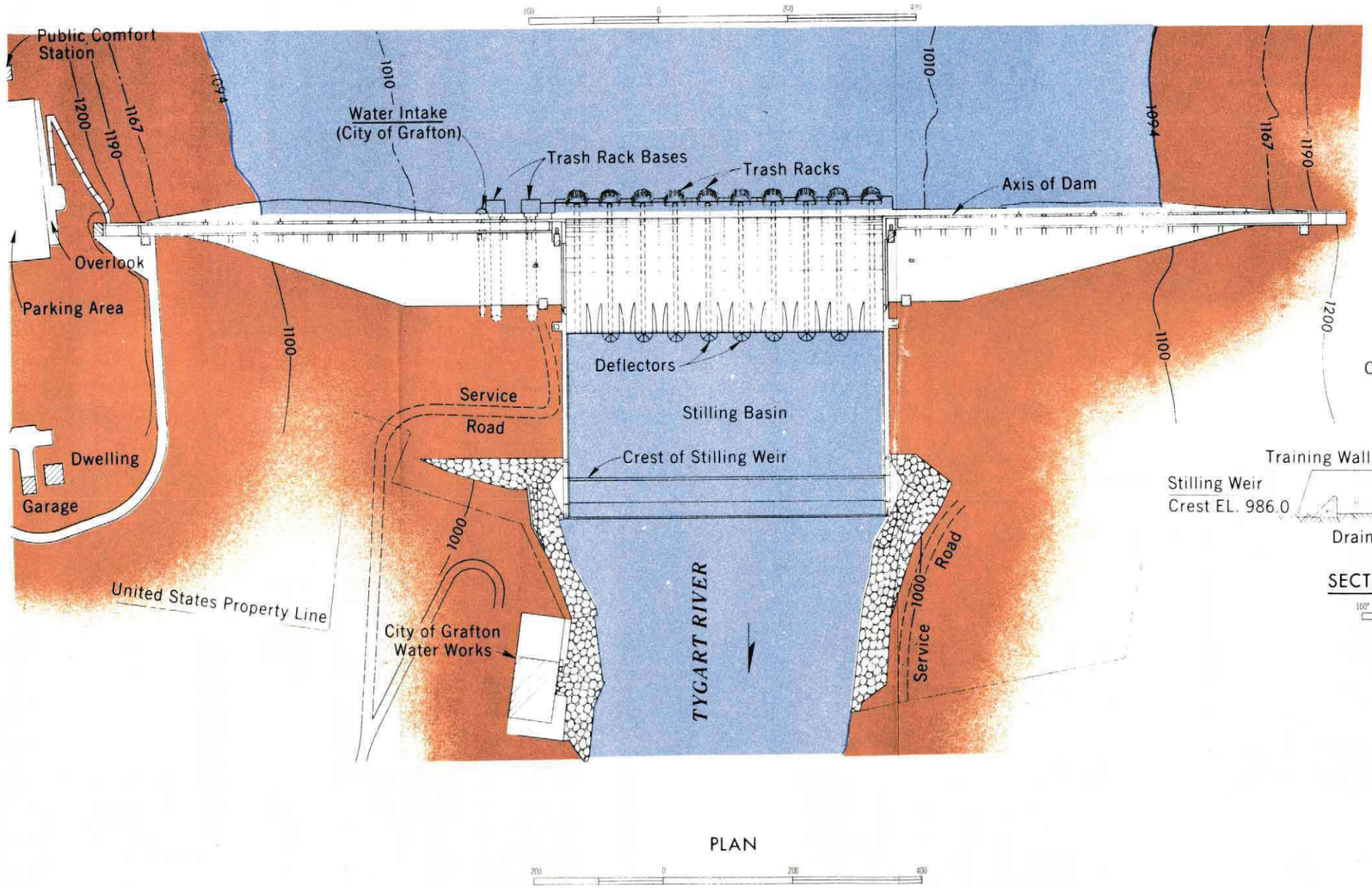
(Stilling Weir Not Shown)



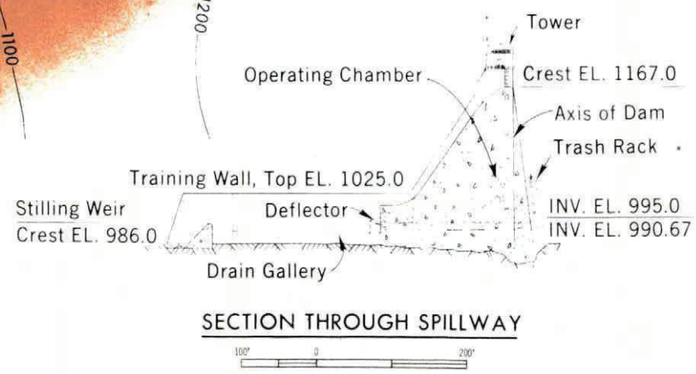
VICINITY MAP

SCALE OF MILES

35 0 70



PLAN



SECTION THROUGH SPILLWAY

TYGART RIVER DAM

PLAN, ELEVATION AND SECTION

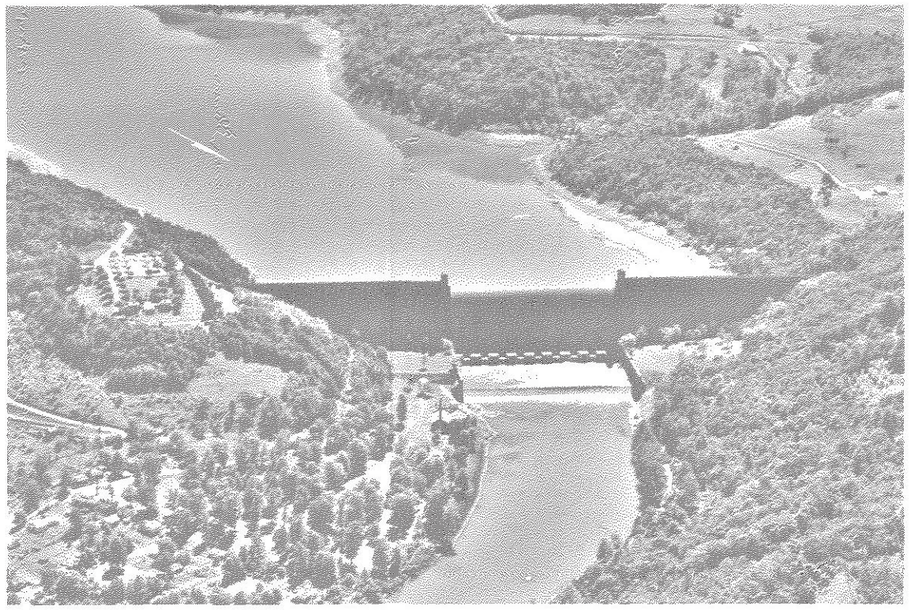
PITTSBURGH DISTRICT, PITTSBURGH, PA.

Revised: 30 September 1976

Elevations in feet NGVD29

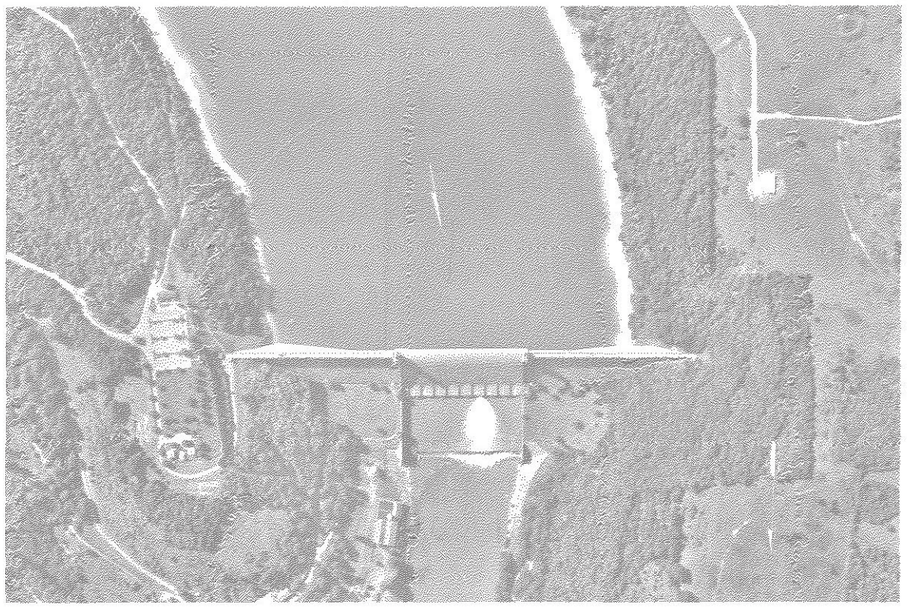
PLATE 4

R/H 11
TYGART LAKE

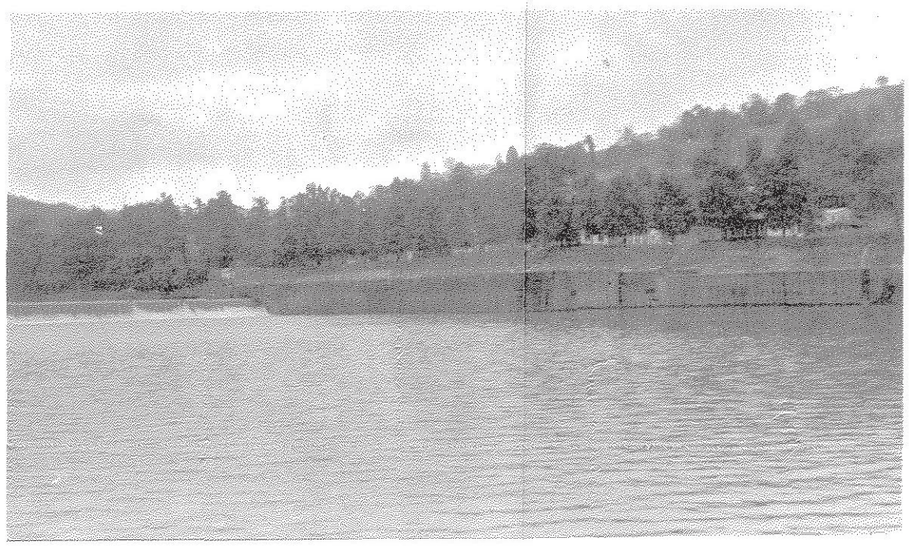


26 AUG, 1963

MONONGAHELA RIVER BELOW DAM 12 DURING DROUGHT OF 1930.
THIS WAS PRIOR TO COMPLETION OF TYGART RIVER DAM.



27 AUG, 1963



MONONGAHELA RIVER BELOW DAM 12 DURING NORMAL LOW FLOW
PERIOD AFTER COMPLETION OF TYGART RIVER DAM.

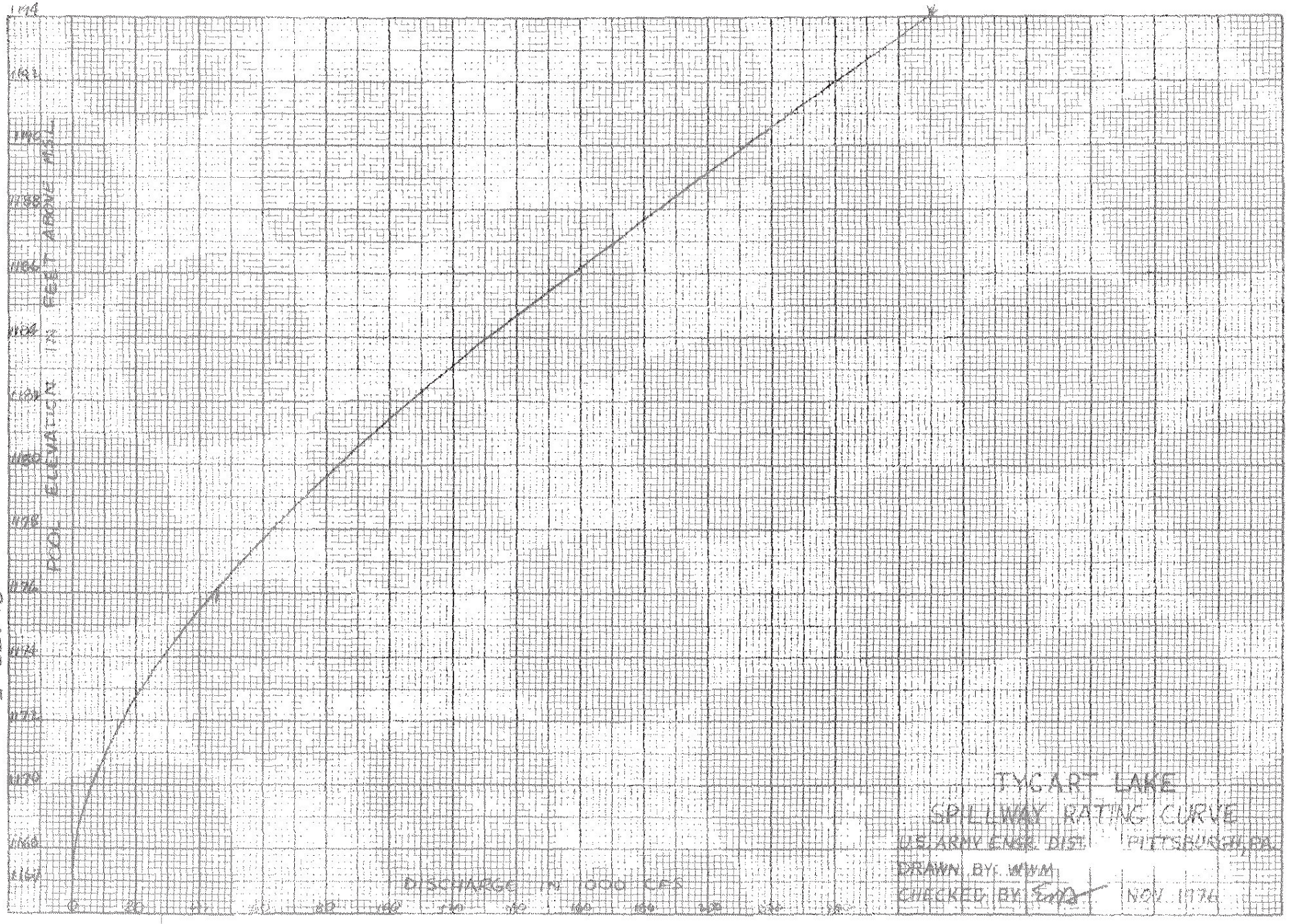

POOL ELEVATION IN FEET ABOVE MSL
DISCHARGE IN 1000 CFS
TYCART LAKE
SPILLWAY RATING CURVE
U.S. ARMY E.N.G.R. DIST. PITTSBURGH, PA.
DRAWN BY: W.W.M.
CHECKED BY:
NOV. 1976

PLATE 5

Tygart 0.5 ft. - 3 ft. Gates 1, 2, 3, 4, 5, 6, 7 & 8
Invert Elev. = 994.8 ft

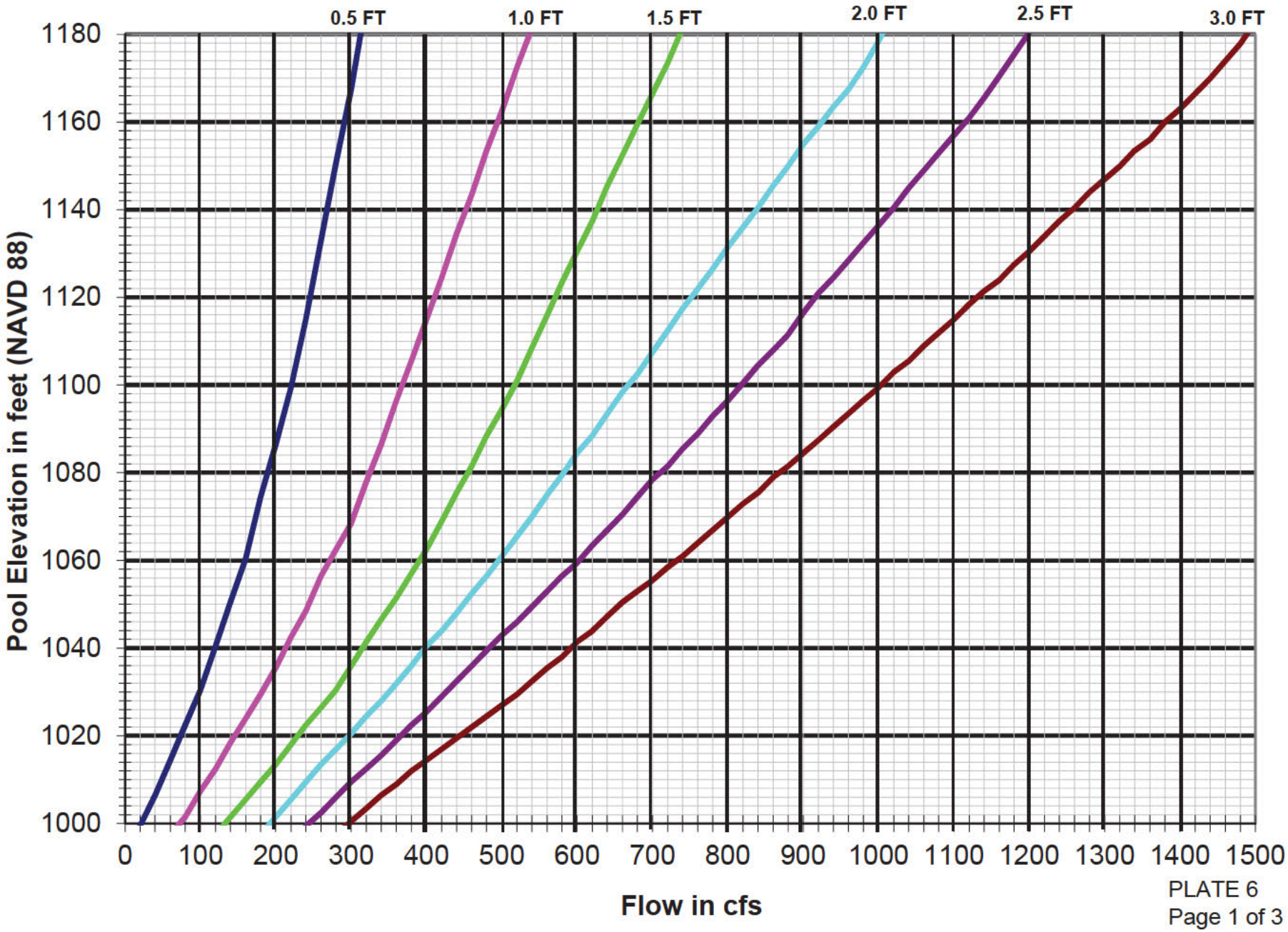


PLATE 6

Tygart 4 ft. - 5 ft. Gates 1, 2, 3, 4, 5, 6, 7 & 8
Invert Elev. = 994.8 ft

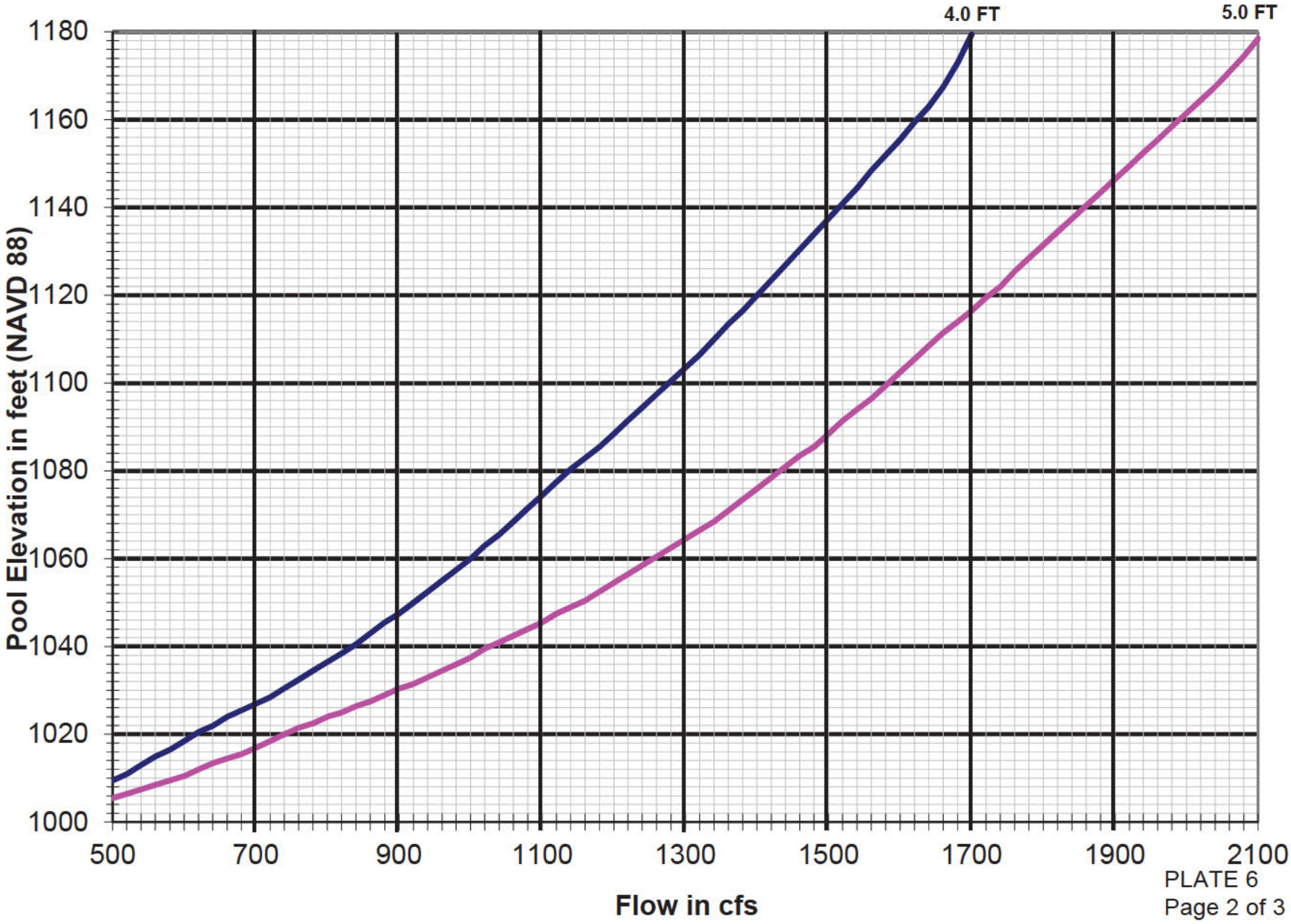


PLATE 6

Tygart 5 ft. - 10 ft. Gates 1, 2, 3, 4, 5, 6, 7 & 8
Invert Elev. = 994.8 ft

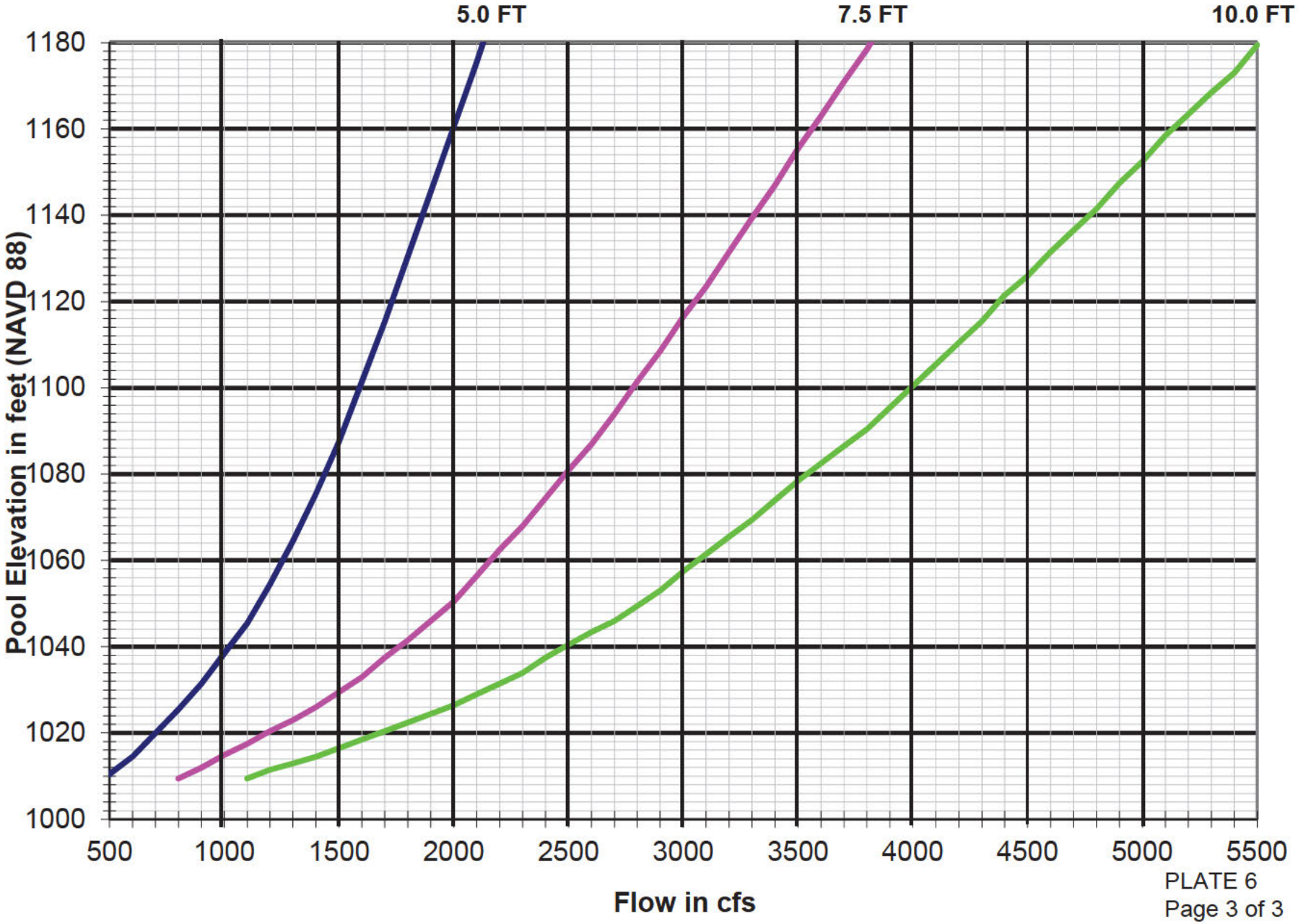


PLATE 6

Tygart Ring Jets 1 & 2
Invert Elev. = 989.6 ft

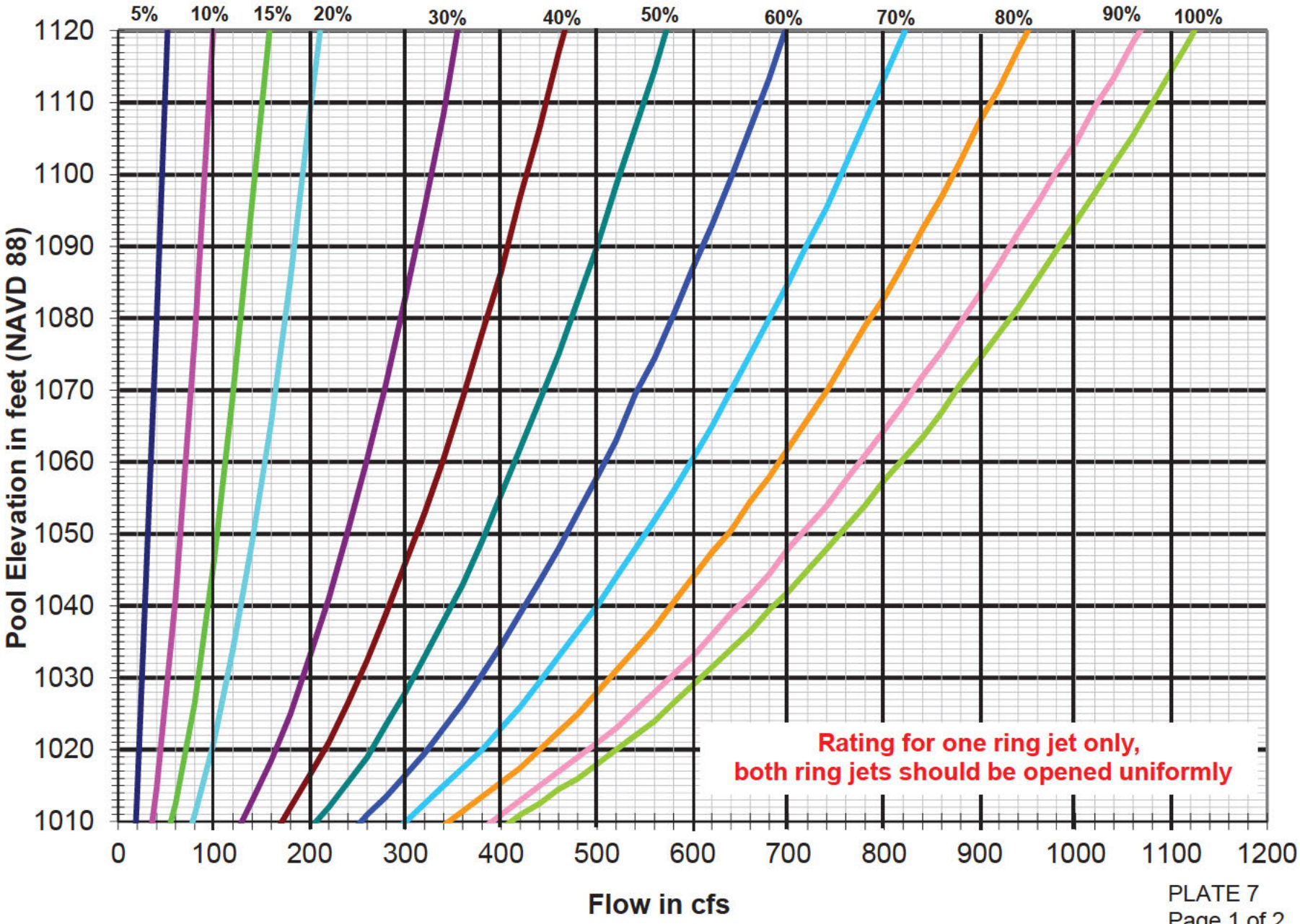


PLATE 7
Page 1 of 2

Tygart Ring Jets 1 & 2
Invert Elev. = 989.6 ft

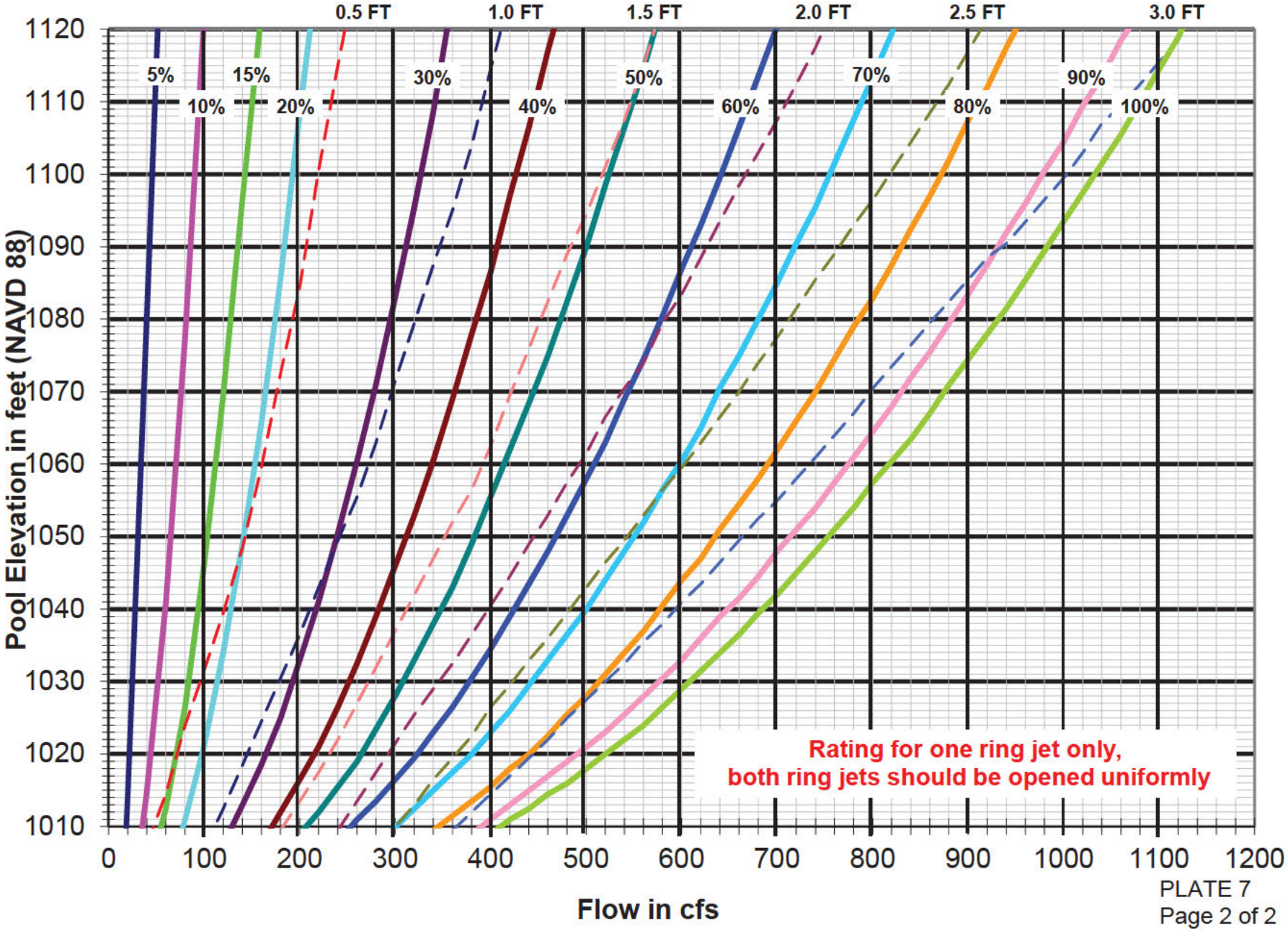


PLATE 7
Page 2 of 2

GAGE HEIGHT IN FEET
ZERO DATUM 9600 FEET ABOVE MSL
0
5
10
15
20
0
5
10
15
20
25
30
DISCHARGE IN 1000 CFS
TYGART LAKE
OUTFLOW RATING CURVE
AT CARR CHINA
U.S. ARMY ENGR. DIST. PITTSBURGH, PA.
DRAWN BY: GHP
CHECKED BY: EMR
NOV. 1976

PLATE 8

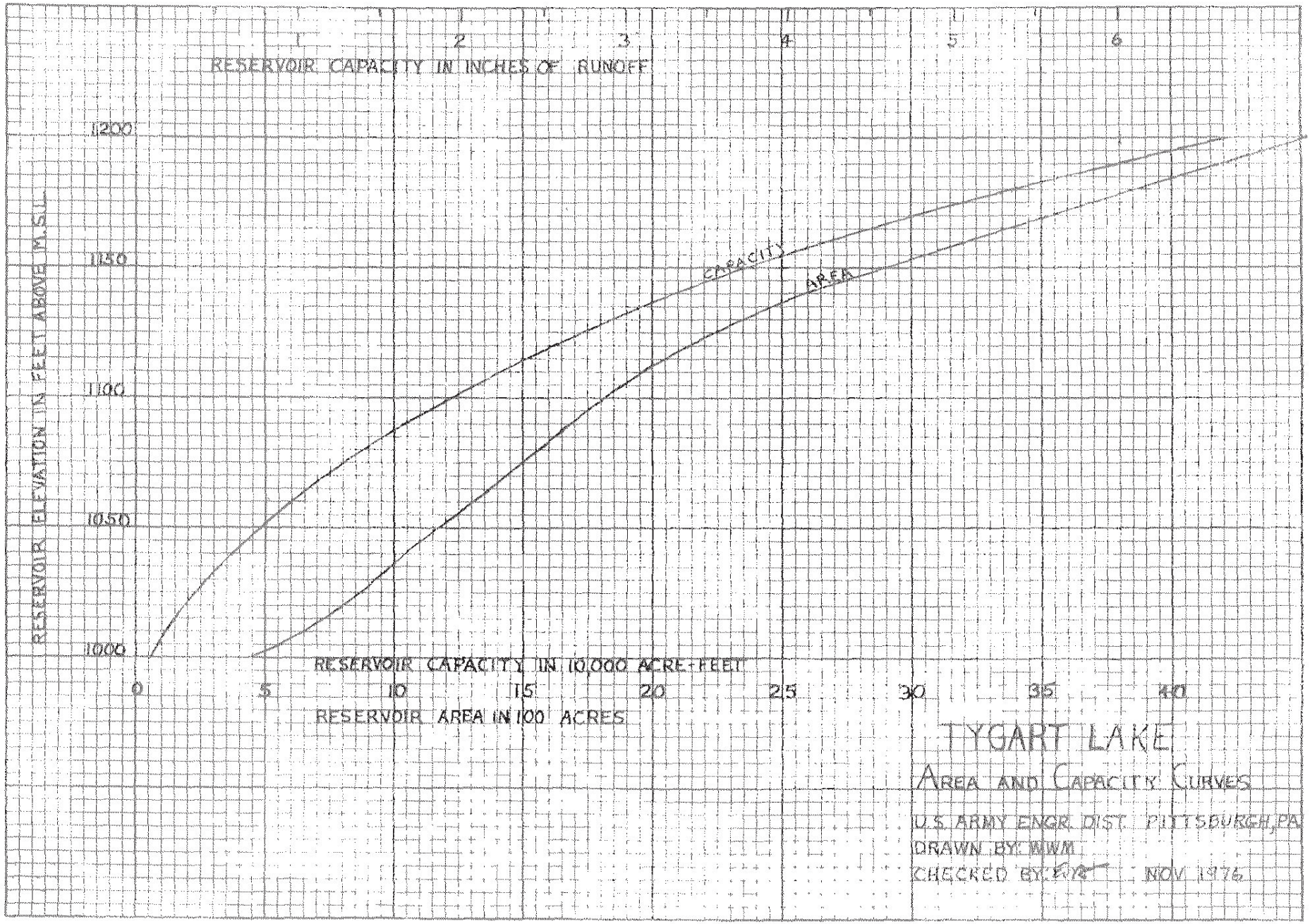
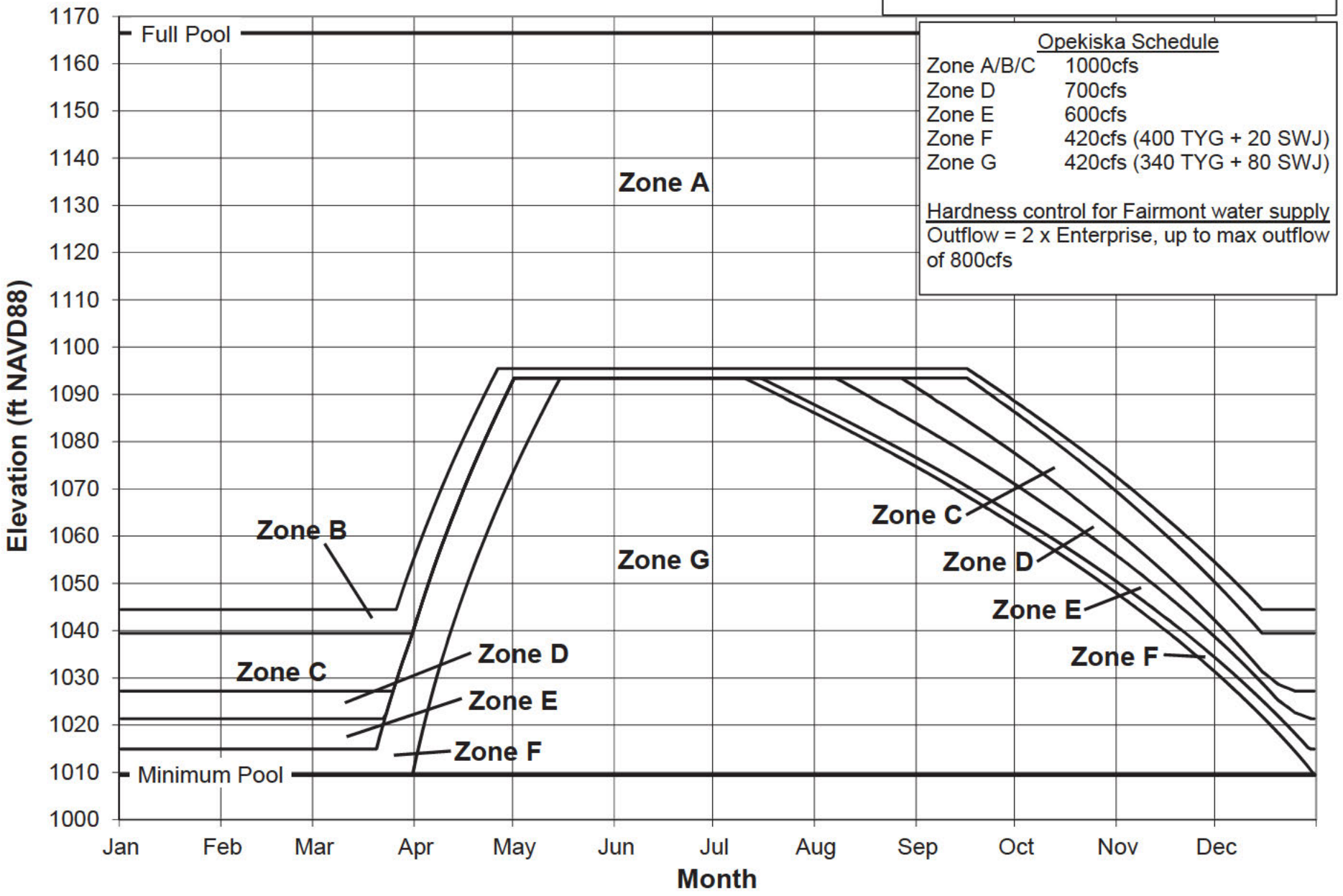

RESERVOIR CAPACITY IN INCHES OF RUNOFF
1
2
3
4
5
6
1200
1150
1100
1050
1000
RESERVOIR ELEVATION IN FEET ABOVE M.S.L.
CAPACITY
AREA
0
5
10
15
20
25
30
35
40
RESERVOIR CAPACITY IN 10,000 ACRE-FEET
RESERVOIR AREA IN 100 ACRES
TYGART LAKE
AREA AND CAPACITY CURVES
U.S. ARMY ENGR. DIST. PITTSBURGH, PA.
DRAWN BY: MWM
CHECKED BY:
NOV 1976

PLATE 9

Tygart Lake
Water Control Plan

Zone A - Flood Control - Release at maximum possible rate, based on downstream conditions
Zone B - Transition - Gradually reduce outflow to reach Zones C-G within 10 days



Opekiska Schedule

Zone A/B/C	1000cfs
Zone D	700cfs
Zone E	600cfs
Zone F	420cfs (400 TYG + 20 SWJ)
Zone G	420cfs (340 TYG + 80 SWJ)

Hardness control for Fairmont water supply
Outflow = 2 x Enterprise, up to max outflow of 800cfs

PLATE 10

Tygart J-Date	Date	Full Pool Elevation (ft NAVD88)	Full Pool Storage (ac-ft)	Minimum Pool Elevation (ft NAVD88)	Minimum Pool Storage (ac-ft)	Guide Curve - Max Conservation Elevation (ft NAVD88)	Guide Curve - Max Conservation Storage (ac-ft)	Rule Curve - Top of Zone A Elevation (ft NAVD88)	Rule Curve - Top of Zone A Storage (ac-ft)
1	1-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
2	2-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
3	3-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
4	4-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
5	5-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
6	6-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
7	7-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
8	8-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
9	9-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
10	10-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
11	11-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
12	12-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
13	13-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
14	14-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
15	15-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
16	16-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
17	17-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
18	18-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
19	19-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
20	20-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
21	21-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
22	22-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
23	23-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
24	24-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
25	25-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
26	26-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
27	27-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
28	28-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
29	29-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
30	30-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
31	31-Jan	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
32	1-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
33	2-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
34	3-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
35	4-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
36	5-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
37	6-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
38	7-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
39	8-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
40	9-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
41	10-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
42	11-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
43	12-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
44	13-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
45	14-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
46	15-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
47	16-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
48	17-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
49	18-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
50	19-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
51	20-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
52	21-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
53	22-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
54	23-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
55	24-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
56	25-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
57	26-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
58	27-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
59	28-Feb	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
60	1-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
61	2-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
62	3-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
63	4-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
64	5-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
65	6-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
66	7-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
67	8-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
68	9-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
69	10-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
70	11-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600

Tygart J-Date	Date	Full Pool Elevation (ft NAVD88)	Full Pool Storage (ac-ft)	Minimum Pool Elevation (ft NAVD88)	Minimum Pool Storage (ac-ft)	Guide Curve - Max Conservation Elevation (ft NAVD88)	Guide Curve - Max Conservation Storage (ac-ft)	Rule Curve - Top of Zone A Elevation (ft NAVD88)	Rule Curve - Top of Zone A Storage (ac-ft)
71	12-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
72	13-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
73	14-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
74	15-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
75	16-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
76	17-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
77	18-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
78	19-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
79	20-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
80	21-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
81	22-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
82	23-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
83	24-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
84	25-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
85	26-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
86	27-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
87	28-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
88	29-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
89	30-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
90	31-Mar	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
91	1-Apr	1166.45	289600	1009.45	11200	1041.73	39105	1166.45	289600
92	2-Apr	1166.45	289600	1009.45	11200	1043.95	41510	1166.45	289600
93	3-Apr	1166.45	289600	1009.45	11200	1046.12	43915	1166.45	289600
94	4-Apr	1166.45	289600	1009.45	11200	1048.25	46319	1166.45	289600
95	5-Apr	1166.45	289600	1009.45	11200	1050.33	48724	1166.45	289600
96	6-Apr	1166.45	289600	1009.45	11200	1052.37	51129	1166.45	289600
97	7-Apr	1166.45	289600	1009.45	11200	1054.35	53534	1166.45	289600
98	8-Apr	1166.45	289600	1009.45	11200	1056.30	55939	1166.45	289600
99	9-Apr	1166.45	289600	1009.45	11200	1058.18	58344	1166.45	289600
100	10-Apr	1166.45	289600	1009.45	11200	1060.02	60748	1166.45	289600
101	11-Apr	1166.45	289600	1009.45	11200	1061.84	63153	1166.45	289600
102	12-Apr	1166.45	289600	1009.45	11200	1063.64	65558	1166.45	289600
103	13-Apr	1166.45	289600	1009.45	11200	1065.42	67963	1166.45	289600
104	14-Apr	1166.45	289600	1009.45	11200	1067.19	70368	1166.45	289600
105	15-Apr	1166.45	289600	1009.45	11200	1068.93	72773	1166.45	289600
106	16-Apr	1166.45	289600	1009.45	11200	1070.65	75177	1166.45	289600
107	17-Apr	1166.45	289600	1009.45	11200	1072.33	77582	1166.45	289600
108	18-Apr	1166.45	289600	1009.45	11200	1073.97	79987	1166.45	289600
109	19-Apr	1166.45	289600	1009.45	11200	1075.59	82392	1166.45	289600
110	20-Apr	1166.45	289600	1009.45	11200	1077.18	84797	1166.45	289600
111	21-Apr	1166.45	289600	1009.45	11200	1078.75	87202	1166.45	289600
112	22-Apr	1166.45	289600	1009.45	11200	1080.28	89606	1166.45	289600
113	23-Apr	1166.45	289600	1009.45	11200	1081.80	92011	1166.45	289600
114	24-Apr	1166.45	289600	1009.45	11200	1083.31	94416	1166.45	289600
115	25-Apr	1166.45	289600	1009.45	11200	1084.80	96821	1166.45	289600
116	26-Apr	1166.45	289600	1009.45	11200	1086.28	99226	1166.45	289600
117	27-Apr	1166.45	289600	1009.45	11200	1087.72	101631	1166.45	289600
118	28-Apr	1166.45	289600	1009.45	11200	1089.17	104035	1166.45	289600
119	29-Apr	1166.45	289600	1009.45	11200	1090.64	106440	1166.45	289600
120	30-Apr	1166.45	289600	1009.45	11200	1092.06	108845	1166.45	289600
121	1-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
122	2-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
123	3-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
124	4-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
125	5-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
126	6-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
127	7-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
128	8-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
129	9-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
130	10-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
131	11-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
132	12-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
133	13-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
134	14-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
135	15-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
136	16-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
137	17-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
138	18-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
139	19-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
140	20-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600

Tygart J-Date	Date	Full Pool Elevation (ft NAVD88)	Full Pool Storage (ac-ft)	Minimum Pool Elevation (ft NAVD88)	Minimum Pool Storage (ac-ft)	Guide Curve - Max Conservation Elevation (ft NAVD88)	Guide Curve - Max Conservation Storage (ac-ft)	Rule Curve - Top of Zone A Elevation (ft NAVD88)	Rule Curve - Top of Zone A Storage (ac-ft)
141	21-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
142	22-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
143	23-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
144	24-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
145	25-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
146	26-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
147	27-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
148	28-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
149	29-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
150	30-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
151	31-May	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
152	1-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
153	2-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
154	3-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
155	4-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
156	5-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
157	6-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
158	7-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
159	8-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
160	9-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
161	10-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
162	11-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
163	12-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
164	13-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
165	14-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
166	15-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
167	16-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
168	17-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
169	18-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
170	19-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
171	20-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
172	21-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
173	22-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
174	23-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
175	24-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
176	25-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
177	26-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
178	27-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
179	28-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
180	29-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
181	30-Jun	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
182	1-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
183	2-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
184	3-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
185	4-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
186	5-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
187	6-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
188	7-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
189	8-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
190	9-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
191	10-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
192	11-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
193	12-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
194	13-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
195	14-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
196	15-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
197	16-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
198	17-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
199	18-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
200	19-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
201	20-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
202	21-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
203	22-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
204	23-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
205	24-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
206	25-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
207	26-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
208	27-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
209	28-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
210	29-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600

Tygart J-Date	Date	Full Pool Elevation (ft NAVD88)	Full Pool Storage (ac-ft)	Minimum Pool Elevation (ft NAVD88)	Minimum Pool Storage (ac-ft)	Guide Curve - Max Conservation Elevation (ft NAVD88)	Guide Curve - Max Conservation Storage (ac-ft)	Rule Curve - Top of Zone A Elevation (ft NAVD88)	Rule Curve - Top of Zone A Storage (ac-ft)
211	30-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
212	31-Jul	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
213	1-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
214	2-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
215	3-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
216	4-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
217	5-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
218	6-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
219	7-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
220	8-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
221	9-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
222	10-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
223	11-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
224	12-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
225	13-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
226	14-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
227	15-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
228	16-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
229	17-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
230	18-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
231	19-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
232	20-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
233	21-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
234	22-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
235	23-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
236	24-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
237	25-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
238	26-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
239	27-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
240	28-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
241	29-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
242	30-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
243	31-Aug	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
244	1-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
245	2-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
246	3-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
247	4-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
248	5-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
249	6-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
250	7-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
251	8-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
252	9-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
253	10-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
254	11-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
255	12-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
256	13-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
257	14-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
258	15-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
259	16-Sep	1166.45	289600	1009.45	11200	1093.45	111250	1166.45	289600
260	17-Sep	1166.45	289600	1009.45	11200	1092.97	110422	1166.45	289600
261	18-Sep	1166.45	289600	1009.45	11200	1092.49	109593	1166.45	289600
262	19-Sep	1166.45	289600	1009.45	11200	1092.01	108765	1166.45	289600
263	20-Sep	1166.45	289600	1009.45	11200	1091.52	107937	1166.45	289600
264	21-Sep	1166.45	289600	1009.45	11200	1091.03	107108	1166.45	289600
265	22-Sep	1166.45	289600	1009.45	11200	1090.54	106280	1166.45	289600
266	23-Sep	1166.45	289600	1009.45	11200	1090.05	105452	1166.45	289600
267	24-Sep	1166.45	289600	1009.45	11200	1089.55	104623	1166.45	289600
268	25-Sep	1166.45	289600	1009.45	11200	1089.01	103795	1166.45	289600
269	26-Sep	1166.45	289600	1009.45	11200	1088.45	102967	1166.45	289600
270	27-Sep	1166.45	289600	1009.45	11200	1088.00	102138	1166.45	289600
271	28-Sep	1166.45	289600	1009.45	11200	1087.54	101310	1166.45	289600
272	29-Sep	1166.45	289600	1009.45	11200	1087.05	100482	1166.45	289600
273	30-Sep	1166.45	289600	1009.45	11200	1086.54	99653	1166.45	289600
274	1-Oct	1166.45	289600	1009.45	11200	1086.04	98825	1166.45	289600
275	2-Oct	1166.45	289600	1009.45	11200	1085.53	97997	1166.45	289600
276	3-Oct	1166.45	289600	1009.45	11200	1085.02	97168	1166.45	289600
277	4-Oct	1166.45	289600	1009.45	11200	1084.51	96340	1166.45	289600
278	5-Oct	1166.45	289600	1009.45	11200	1083.99	95512	1166.45	289600
279	6-Oct	1166.45	289600	1009.45	11200	1083.48	94683	1166.45	289600
280	7-Oct	1166.45	289600	1009.45	11200	1082.96	93855	1166.45	289600

Tygart J-Date	Date	Full Pool Elevation (ft NAVD88)	Full Pool Storage (ac-ft)	Minimum Pool Elevation (ft NAVD88)	Minimum Pool Storage (ac-ft)	Guide Curve - Max Conservation Elevation (ft NAVD88)	Guide Curve - Max Conservation Storage (ac-ft)	Rule Curve - Top of Zone A Elevation (ft NAVD88)	Rule Curve - Top of Zone A Storage (ac-ft)
281	8-Oct	1166.45	289600	1009.45	11200	1082.44	93027	1166.45	289600
282	9-Oct	1166.45	289600	1009.45	11200	1081.92	92198	1166.45	289600
283	10-Oct	1166.45	289600	1009.45	11200	1081.40	91370	1166.45	289600
284	11-Oct	1166.45	289600	1009.45	11200	1080.88	90542	1166.45	289600
285	12-Oct	1166.45	289600	1009.45	11200	1080.35	89713	1166.45	289600
286	13-Oct	1166.45	289600	1009.45	11200	1079.82	88885	1166.45	289600
287	14-Oct	1166.45	289600	1009.45	11200	1079.29	88057	1166.45	289600
288	15-Oct	1166.45	289600	1009.45	11200	1078.76	87228	1166.45	289600
289	16-Oct	1166.45	289600	1009.45	11200	1078.23	86400	1166.45	289600
290	17-Oct	1166.45	289600	1009.45	11200	1077.69	85572	1166.45	289600
291	18-Oct	1166.45	289600	1009.45	11200	1077.15	84743	1166.45	289600
292	19-Oct	1166.45	289600	1009.45	11200	1076.60	83915	1166.45	289600
293	20-Oct	1166.45	289600	1009.45	11200	1076.05	83087	1166.45	289600
294	21-Oct	1166.45	289600	1009.45	11200	1075.50	82258	1166.45	289600
295	22-Oct	1166.45	289600	1009.45	11200	1074.95	81430	1166.45	289600
296	23-Oct	1166.45	289600	1009.45	11200	1074.39	80602	1166.45	289600
297	24-Oct	1166.45	289600	1009.45	11200	1073.83	79773	1166.45	289600
298	25-Oct	1166.45	289600	1009.45	11200	1073.26	78945	1166.45	289600
299	26-Oct	1166.45	289600	1009.45	11200	1072.69	78117	1166.45	289600
300	27-Oct	1166.45	289600	1009.45	11200	1072.12	77288	1166.45	289600
301	28-Oct	1166.45	289600	1009.45	11200	1071.55	76460	1166.45	289600
302	29-Oct	1166.45	289600	1009.45	11200	1070.97	75632	1166.45	289600
303	30-Oct	1166.45	289600	1009.45	11200	1070.38	74803	1166.45	289600
304	31-Oct	1166.45	289600	1009.45	11200	1069.79	73975	1166.45	289600
305	1-Nov	1166.45	289600	1009.45	11200	1069.20	73147	1166.45	289600
306	2-Nov	1166.45	289600	1009.45	11200	1068.60	72318	1166.45	289600
307	3-Nov	1166.45	289600	1009.45	11200	1068.00	71490	1166.45	289600
308	4-Nov	1166.45	289600	1009.45	11200	1067.40	70662	1166.45	289600
309	5-Nov	1166.45	289600	1009.45	11200	1066.80	69833	1166.45	289600
310	6-Nov	1166.45	289600	1009.45	11200	1066.19	69005	1166.45	289600
311	7-Nov	1166.45	289600	1009.45	11200	1065.58	68177	1166.45	289600
312	8-Nov	1166.45	289600	1009.45	11200	1064.97	67348	1166.45	289600
313	9-Nov	1166.45	289600	1009.45	11200	1064.35	66520	1166.45	289600
314	10-Nov	1166.45	289600	1009.45	11200	1063.74	65692	1166.45	289600
315	11-Nov	1166.45	289600	1009.45	11200	1063.12	64863	1166.45	289600
316	12-Nov	1166.45	289600	1009.45	11200	1062.51	64035	1166.45	289600
317	13-Nov	1166.45	289600	1009.45	11200	1061.88	63207	1166.45	289600
318	14-Nov	1166.45	289600	1009.45	11200	1061.26	62378	1166.45	289600
319	15-Nov	1166.45	289600	1009.45	11200	1060.63	61550	1166.45	289600
320	16-Nov	1166.45	289600	1009.45	11200	1060.00	60722	1166.45	289600
321	17-Nov	1166.45	289600	1009.45	11200	1059.37	59893	1166.45	289600
322	18-Nov	1166.45	289600	1009.45	11200	1058.74	59065	1166.45	289600
323	19-Nov	1166.45	289600	1009.45	11200	1058.10	58237	1166.45	289600
324	20-Nov	1166.45	289600	1009.45	11200	1057.46	57408	1166.45	289600
325	21-Nov	1166.45	289600	1009.45	11200	1056.80	56580	1166.45	289600
326	22-Nov	1166.45	289600	1009.45	11200	1056.15	55752	1166.45	289600
327	23-Nov	1166.45	289600	1009.45	11200	1055.48	54923	1166.45	289600
328	24-Nov	1166.45	289600	1009.45	11200	1054.81	54095	1166.45	289600
329	25-Nov	1166.45	289600	1009.45	11200	1054.14	53267	1166.45	289600
330	26-Nov	1166.45	289600	1009.45	11200	1053.46	52438	1166.45	289600
331	27-Nov	1166.45	289600	1009.45	11200	1052.77	51610	1166.45	289600
332	28-Nov	1166.45	289600	1009.45	11200	1052.08	50782	1166.45	289600
333	29-Nov	1166.45	289600	1009.45	11200	1051.38	49953	1166.45	289600
334	30-Nov	1166.45	289600	1009.45	11200	1050.68	49125	1166.45	289600
335	1-Dec	1166.45	289600	1009.45	11200	1049.96	48297	1166.45	289600
336	2-Dec	1166.45	289600	1009.45	11200	1049.25	47468	1166.45	289600
337	3-Dec	1166.45	289600	1009.45	11200	1048.53	46640	1166.45	289600
338	4-Dec	1166.45	289600	1009.45	11200	1047.80	45812	1166.45	289600
339	5-Dec	1166.45	289600	1009.45	11200	1047.07	44983	1166.45	289600
340	6-Dec	1166.45	289600	1009.45	11200	1046.34	44155	1166.45	289600
341	7-Dec	1166.45	289600	1009.45	11200	1045.60	43327	1166.45	289600
342	8-Dec	1166.45	289600	1009.45	11200	1044.85	42498	1166.45	289600
343	9-Dec	1166.45	289600	1009.45	11200	1044.10	41670	1166.45	289600
344	10-Dec	1166.45	289600	1009.45	11200	1043.34	40842	1166.45	289600
345	11-Dec	1166.45	289600	1009.45	11200	1042.57	40013	1166.45	289600
346	12-Dec	1166.45	289600	1009.45	11200	1041.80	39185	1166.45	289600
347	13-Dec	1166.45	289600	1009.45	11200	1041.02	38357	1166.45	289600
348	14-Dec	1166.45	289600	1009.45	11200	1040.24	37528	1166.45	289600
349	15-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
350	16-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600

Tygart J-Date	Date	Full Pool Elevation (ft NAVD88)	Full Pool Storage (ac-ft)	Minimum Pool Elevation (ft NAVD88)	Minimum Pool Storage (ac-ft)	Guide Curve - Max Conservation Elevation (ft NAVD88)	Guide Curve - Max Conservation Storage (ac-ft)	Rule Curve - Top of Zone A Elevation (ft NAVD88)	Rule Curve - Top of Zone A Storage (ac-ft)
351	17-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
352	18-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
353	19-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
354	20-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
355	21-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
356	22-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
357	23-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
358	24-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
359	25-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
360	26-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
361	27-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
362	28-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
363	29-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
364	30-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
365	31-Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600
366	same as 31Dec	1166.45	289600	1009.45	11200	1039.45	36700	1166.45	289600

Tygart J-Date	Date	Rule Curve - Top of Zone B Elevation (ft NAVD88)	Rule Curve - Top of Zone B Storage (ac-ft)	Rule Curve - Top of Zone C Elevation (ft NAVD88)	Rule Curve - Top of Zone C Storage (ac-ft)	Rule Curve - Top of Zone D Elevation (ft NAVD88)	Rule Curve - Top of Zone D Storage (ac-ft)	Rule Curve - Top of Zone E Elevation (ft NAVD88)	Rule Curve - Top of Zone E Storage (ac-ft)
1	1-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
2	2-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
3	3-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
4	4-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
5	5-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
6	6-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
7	7-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
8	8-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
9	9-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
10	10-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
11	11-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
12	12-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
13	13-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
14	14-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
15	15-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
16	16-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
17	17-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
18	18-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
19	19-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
20	20-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
21	21-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
22	22-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
23	23-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
24	24-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
25	25-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
26	26-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
27	27-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
28	28-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
29	29-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
30	30-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
31	31-Jan	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
32	1-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
33	2-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
34	3-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
35	4-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
36	5-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
37	6-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
38	7-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
39	8-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
40	9-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
41	10-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
42	11-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
43	12-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
44	13-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
45	14-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
46	15-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
47	16-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
48	17-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
49	18-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
50	19-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
51	20-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
52	21-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
53	22-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
54	23-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
55	24-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
56	25-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
57	26-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
58	27-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
59	28-Feb	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
60	1-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
61	2-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
62	3-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
63	4-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
64	5-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
65	6-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
66	7-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
67	8-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
68	9-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
69	10-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
70	11-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000

Tygart J-Date	Date	Rule Curve - Top of Zone B Elevation (ft NAVD88)	Rule Curve - Top of Zone B Storage (ac-ft)	Rule Curve - Top of Zone C Elevation (ft NAVD88)	Rule Curve - Top of Zone C Storage (ac-ft)	Rule Curve - Top of Zone D Elevation (ft NAVD88)	Rule Curve - Top of Zone D Storage (ac-ft)	Rule Curve - Top of Zone E Elevation (ft NAVD88)	Rule Curve - Top of Zone E Storage (ac-ft)
71	12-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
72	13-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
73	14-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
74	15-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
75	16-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
76	17-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
77	18-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
78	19-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
79	20-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
80	21-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
81	22-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
82	23-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1022.46	20918
83	24-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1024.79	22891
84	25-Mar	1044.45	42050	1039.45	36700	1027.21	25000	1027.06	24864
85	26-Mar	1044.45	42050	1039.45	36700	1029.27	26836	1029.27	26836
86	27-Mar	1046.55	44396	1039.45	36700	1031.43	28809	1031.43	28809
87	28-Mar	1048.62	46742	1039.45	36700	1033.51	30782	1033.51	30782
88	29-Mar	1050.64	49087	1039.45	36700	1035.55	32755	1035.55	32755
89	30-Mar	1052.63	51433	1039.45	36700	1037.53	34727	1037.53	34727
90	31-Mar	1054.55	53779	1039.45	36700	1039.45	36700	1039.45	36700
91	1-Apr	1056.45	56125	1041.73	39105	1041.73	39105	1041.73	39105
92	2-Apr	1058.28	58471	1043.95	41510	1043.95	41510	1043.95	41510
93	3-Apr	1060.07	60816	1046.12	43915	1046.12	43915	1046.12	43915
94	4-Apr	1061.85	63162	1048.25	46319	1048.25	46319	1048.25	46319
95	5-Apr	1063.60	65508	1050.33	48724	1050.33	48724	1050.33	48724
96	6-Apr	1065.34	67854	1052.37	51129	1052.37	51129	1052.37	51129
97	7-Apr	1067.06	70200	1054.35	53534	1054.35	53534	1054.35	53534
98	8-Apr	1068.76	72545	1056.30	55939	1056.30	55939	1056.30	55939
99	9-Apr	1070.44	74891	1058.18	58344	1058.18	58344	1058.18	58344
100	10-Apr	1072.09	77237	1060.02	60748	1060.02	60748	1060.02	60748
101	11-Apr	1073.70	79583	1061.84	63153	1061.84	63153	1061.84	63153
102	12-Apr	1075.28	81929	1063.64	65558	1063.64	65558	1063.64	65558
103	13-Apr	1076.84	84275	1065.42	67963	1065.42	67963	1065.42	67963
104	14-Apr	1078.37	86620	1067.19	70368	1067.19	70368	1067.19	70368
105	15-Apr	1079.87	88966	1068.93	72773	1068.93	72773	1068.93	72773
106	16-Apr	1081.36	91312	1070.65	75177	1070.65	75177	1070.65	75177
107	17-Apr	1082.84	93658	1072.33	77582	1072.33	77582	1072.33	77582
108	18-Apr	1084.30	96004	1073.97	79987	1073.97	79987	1073.97	79987
109	19-Apr	1085.74	98349	1075.59	82392	1075.59	82392	1075.59	82392
110	20-Apr	1087.18	100695	1077.18	84797	1077.18	84797	1077.18	84797
111	21-Apr	1088.50	103041	1078.75	87202	1078.75	87202	1078.75	87202
112	22-Apr	1090.01	105387	1080.28	89606	1080.28	89606	1080.28	89606
113	23-Apr	1091.40	107733	1081.80	92011	1081.80	92011	1081.80	92011
114	24-Apr	1092.77	110078	1083.31	94416	1083.31	94416	1083.31	94416
115	25-Apr	1094.12	112424	1084.80	96821	1084.80	96821	1084.80	96821
116	26-Apr	1095.45	114770	1086.28	99226	1086.28	99226	1086.28	99226
117	27-Apr	1095.45	114770	1087.72	101631	1087.72	101631	1087.72	101631
118	28-Apr	1095.45	114770	1089.17	104035	1089.17	104035	1089.17	104035
119	29-Apr	1095.45	114770	1090.64	106440	1090.64	106440	1090.64	106440
120	30-Apr	1095.45	114770	1092.06	108845	1092.06	108845	1092.06	108845
121	1-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
122	2-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
123	3-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
124	4-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
125	5-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
126	6-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
127	7-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
128	8-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
129	9-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
130	10-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
131	11-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
132	12-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
133	13-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
134	14-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
135	15-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
136	16-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
137	17-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
138	18-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
139	19-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
140	20-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250

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141	21-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
142	22-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
143	23-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
144	24-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
145	25-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
146	26-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
147	27-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
148	28-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
149	29-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
150	30-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
151	31-May	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
152	1-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
153	2-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
154	3-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
155	4-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
156	5-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
157	6-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
158	7-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
159	8-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
160	9-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
161	10-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
162	11-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
163	12-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
164	13-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
165	14-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
166	15-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
167	16-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
168	17-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
169	18-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
170	19-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
171	20-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
172	21-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
173	22-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
174	23-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
175	24-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
176	25-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
177	26-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
178	27-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
179	28-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
180	29-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
181	30-Jun	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
182	1-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
183	2-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
184	3-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
185	4-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
186	5-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
187	6-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
188	7-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
189	8-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
190	9-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
191	10-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
192	11-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
193	12-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
194	13-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
195	14-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
196	15-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
197	16-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
198	17-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
199	18-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
200	19-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
201	20-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
202	21-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
203	22-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
204	23-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
205	24-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
206	25-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
207	26-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
208	27-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
209	28-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
210	29-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250

Tygart J-Date	Date	Rule Curve - Top of Zone B Elevation (ft NAVD88)	Rule Curve - Top of Zone B Storage (ac-ft)	Rule Curve - Top of Zone C Elevation (ft NAVD88)	Rule Curve - Top of Zone C Storage (ac-ft)	Rule Curve - Top of Zone D Elevation (ft NAVD88)	Rule Curve - Top of Zone D Storage (ac-ft)	Rule Curve - Top of Zone E Elevation (ft NAVD88)	Rule Curve - Top of Zone E Storage (ac-ft)
211	30-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
212	31-Jul	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
213	1-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
214	2-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
215	3-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
216	4-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
217	5-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
218	6-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
219	7-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.45	111250
220	8-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1093.07	110598
221	9-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1092.70	109946
222	10-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1092.32	109295
223	11-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1091.94	108643
224	12-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1091.56	107991
225	13-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1091.17	107339
226	14-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1090.79	106688
227	15-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1090.40	106036
228	16-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1090.01	105384
229	17-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1089.62	104732
230	18-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1089.20	104080
231	19-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1088.76	103429
232	20-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1088.34	102777
233	21-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1087.99	102125
234	22-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1087.63	101473
235	23-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1087.26	100821
236	24-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1086.86	100170
237	25-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1086.46	99518
238	26-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1086.06	98866
239	27-Aug	1095.45	114770	1093.45	111250	1093.45	111250	1085.66	98214
240	28-Aug	1095.45	114770	1093.45	111250	1093.02	110500	1085.26	97563
241	29-Aug	1095.45	114770	1093.45	111250	1092.58	109750	1084.86	96911
242	30-Aug	1095.45	114770	1093.45	111250	1092.15	109000	1084.46	96259
243	31-Aug	1095.45	114770	1093.45	111250	1091.71	108250	1084.05	95607
244	1-Sep	1095.45	114770	1093.45	111250	1091.27	107500	1083.65	94955
245	2-Sep	1095.45	114770	1093.45	111250	1090.82	106750	1083.24	94304
246	3-Sep	1095.45	114770	1093.45	111250	1090.38	106000	1082.83	93652
247	4-Sep	1095.45	114770	1093.45	111250	1089.93	105250	1082.42	93000
248	5-Sep	1095.45	114770	1093.45	111250	1089.48	104500	1082.01	92348
249	6-Sep	1095.45	114770	1093.45	111250	1088.98	103750	1081.60	91696
250	7-Sep	1095.45	114770	1093.45	111250	1088.47	103000	1081.19	91045
251	8-Sep	1095.45	114770	1093.45	111250	1088.06	102250	1080.78	90393
252	9-Sep	1095.45	114770	1093.45	111250	1087.65	101500	1080.37	89741
253	10-Sep	1095.45	114770	1093.45	111250	1087.21	100750	1079.95	89089
254	11-Sep	1095.45	114770	1093.45	111250	1086.75	100000	1079.54	88438
255	12-Sep	1095.45	114770	1093.45	111250	1086.30	99250	1079.12	87786
256	13-Sep	1095.45	114770	1093.45	111250	1085.84	98500	1078.70	87134
257	14-Sep	1095.45	114770	1093.45	111250	1085.38	97750	1078.28	86482
258	15-Sep	1095.45	114770	1093.45	111250	1084.91	97000	1077.86	85830
259	16-Sep	1095.45	114770	1093.45	111250	1084.45	96250	1077.44	85179
260	17-Sep	1094.99	113962	1092.97	110422	1083.98	95500	1077.01	84527
261	18-Sep	1094.54	113154	1092.49	109593	1083.52	94750	1076.58	83875
262	19-Sep	1094.08	112346	1092.01	108765	1083.05	94000	1076.15	83223
263	20-Sep	1093.61	111538	1091.52	107937	1082.58	93250	1075.71	82571
264	21-Sep	1093.15	110730	1091.03	107108	1082.11	92500	1075.28	81920
265	22-Sep	1092.68	109922	1090.54	106280	1081.64	91750	1074.84	81268
266	23-Sep	1092.21	109114	1090.05	105452	1081.17	91000	1074.40	80616
267	24-Sep	1091.74	108306	1089.55	104623	1080.69	90250	1073.96	79964
268	25-Sep	1091.27	107498	1089.01	103795	1080.21	89500	1073.51	79313
269	26-Sep	1090.79	106690	1088.45	102967	1079.74	88750	1073.07	78661
270	27-Sep	1090.31	105882	1088.00	102138	1079.26	88000	1072.62	78009
271	28-Sep	1089.82	105074	1087.54	101310	1078.78	87250	1072.17	77357
272	29-Sep	1089.33	104266	1087.05	100482	1078.29	86500	1071.72	76705
273	30-Sep	1088.78	103458	1086.54	99653	1077.81	85750	1071.26	76054
274	1-Oct	1088.28	102650	1086.04	98825	1077.32	85000	1070.80	75402
275	2-Oct	1087.83	101842	1085.53	97997	1076.82	84250	1070.34	74750
276	3-Oct	1087.39	101034	1085.02	97168	1076.33	83500	1069.88	74098
277	4-Oct	1086.89	100226	1084.51	96340	1075.83	82750	1069.41	73446
278	5-Oct	1086.40	99418	1083.99	95512	1075.33	82000	1068.94	72795
279	6-Oct	1085.90	98610	1083.48	94683	1074.83	81250	1068.47	72143
280	7-Oct	1085.41	97802	1082.96	93855	1074.32	80500	1068.00	71491

Tygart J-Date	Date	Rule Curve - Top of Zone B Elevation (ft NAVD88)	Rule Curve - Top of Zone B Storage (ac-ft)	Rule Curve - Top of Zone C Elevation (ft NAVD88)	Rule Curve - Top of Zone C Storage (ac-ft)	Rule Curve - Top of Zone D Elevation (ft NAVD88)	Rule Curve - Top of Zone D Storage (ac-ft)	Rule Curve - Top of Zone E Elevation (ft NAVD88)	Rule Curve - Top of Zone E Storage (ac-ft)
281	8-Oct	1084.91	96994	1082.44	93027	1073.81	79750	1067.53	70839
282	9-Oct	1084.41	96186	1081.92	92198	1073.30	79000	1067.05	70188
283	10-Oct	1083.91	95378	1081.40	91370	1072.79	78250	1066.58	69536
284	11-Oct	1083.41	94570	1080.88	90542	1072.27	77500	1066.10	68884
285	12-Oct	1082.90	93762	1080.35	89713	1071.75	76750	1065.62	68232
286	13-Oct	1082.40	92954	1079.82	88885	1071.22	76000	1065.14	67580
287	14-Oct	1081.89	92146	1079.29	88057	1070.70	75250	1064.66	66929
288	15-Oct	1081.38	91338	1078.76	87228	1070.16	74500	1064.17	66277
289	16-Oct	1080.87	90530	1078.23	86400	1069.63	73750	1063.69	65625
290	17-Oct	1080.36	89722	1077.69	85572	1069.09	73000	1063.21	64973
291	18-Oct	1079.84	88914	1077.15	84743	1068.55	72250	1062.72	64321
292	19-Oct	1079.33	88106	1076.60	83915	1068.01	71500	1062.23	63670
293	20-Oct	1078.81	87298	1076.05	83087	1067.46	70750	1061.74	63018
294	21-Oct	1078.29	86490	1075.50	82258	1066.92	70000	1061.25	62366
295	22-Oct	1077.76	85682	1074.95	81430	1066.37	69250	1060.76	61714
296	23-Oct	1077.24	84874	1074.39	80602	1065.82	68500	1060.26	61063
297	24-Oct	1076.70	84066	1073.83	79773	1065.26	67750	1059.76	60411
298	25-Oct	1076.17	83258	1073.26	78945	1064.71	67000	1059.27	59759
299	26-Oct	1075.63	82450	1072.69	78117	1064.15	66250	1058.77	59107
300	27-Oct	1075.09	81642	1072.12	77288	1063.60	65500	1058.27	58455
301	28-Oct	1074.55	80834	1071.55	76460	1063.04	64750	1057.76	57804
302	29-Oct	1074.00	80026	1070.97	75632	1062.48	64000	1057.25	57152
303	30-Oct	1073.45	79218	1070.38	74803	1061.92	63250	1056.74	56500
304	31-Oct	1072.90	78410	1069.79	73975	1061.35	62500	1056.22	55848
305	1-Nov	1072.34	77602	1069.20	73147	1060.78	61750	1055.70	55196
306	2-Nov	1071.78	76794	1068.60	72318	1060.21	61000	1055.18	54545
307	3-Nov	1071.21	75986	1068.00	71490	1059.64	60250	1054.65	53893
308	4-Nov	1070.65	75178	1067.40	70662	1059.07	59500	1054.11	53241
309	5-Nov	1070.07	74370	1066.80	69833	1058.50	58750	1053.58	52589
310	6-Nov	1069.49	73562	1066.19	69005	1057.92	58000	1053.04	51938
311	7-Nov	1068.91	72754	1065.58	68177	1057.33	57250	1052.50	51286
312	8-Nov	1068.33	71946	1064.97	67348	1056.74	56500	1051.96	50634
313	9-Nov	1067.75	71138	1064.35	66520	1056.15	55750	1051.41	49982
314	10-Nov	1067.16	70330	1063.74	65692	1055.55	55000	1050.85	49330
315	11-Nov	1066.57	69522	1063.12	64863	1054.94	54250	1050.29	48679
316	12-Nov	1065.97	68714	1062.51	64035	1054.33	53500	1049.73	48027
317	13-Nov	1065.38	67906	1061.88	63207	1053.71	52750	1049.17	47375
318	14-Nov	1064.78	67098	1061.26	62378	1053.09	52000	1048.60	46723
319	15-Nov	1064.18	66290	1060.63	61550	1052.47	51250	1048.03	46071
320	16-Nov	1063.58	65482	1060.00	60722	1051.84	50500	1047.46	45420
321	17-Nov	1062.98	64674	1059.37	59893	1051.21	49750	1046.88	44768
322	18-Nov	1062.38	63866	1058.74	59065	1050.57	49000	1046.30	44116
323	19-Nov	1061.77	63058	1058.10	58237	1049.92	48250	1045.72	43464
324	20-Nov	1061.16	62250	1057.46	57408	1049.28	47500	1045.14	42813
325	21-Nov	1060.55	61442	1056.80	56580	1048.62	46750	1044.55	42161
326	22-Nov	1059.93	60634	1056.15	55752	1047.97	46000	1043.95	41509
327	23-Nov	1059.32	59826	1055.48	54923	1047.31	45250	1043.35	40857
328	24-Nov	1058.70	59018	1054.81	54095	1046.64	44500	1042.75	40205
329	25-Nov	1058.08	58210	1054.14	53267	1045.98	43750	1042.15	39554
330	26-Nov	1057.45	57402	1053.46	52438	1045.31	43000	1041.54	38902
331	27-Nov	1056.82	56594	1052.77	51610	1044.63	42250	1040.92	38250
332	28-Nov	1056.17	55786	1052.08	50782	1043.95	41500	1040.31	37598
333	29-Nov	1055.53	54978	1051.38	49953	1043.26	40750	1039.68	36946
334	30-Nov	1054.87	54170	1050.68	49125	1042.56	40000	1039.06	36295
335	1-Dec	1054.21	53362	1049.96	48297	1041.86	39250	1038.42	35643
336	2-Dec	1053.55	52554	1049.25	47468	1041.16	38500	1037.78	34991
337	3-Dec	1052.88	51746	1048.53	46640	1040.45	37750	1037.14	34339
338	4-Dec	1052.21	50938	1047.80	45812	1039.74	37000	1036.49	33688
339	5-Dec	1051.53	50130	1047.07	44983	1039.01	36250	1035.83	33036
340	6-Dec	1050.84	49322	1046.34	44155	1038.28	35500	1035.17	32384
341	7-Dec	1050.15	48514	1045.60	43327	1037.55	34750	1034.50	31732
342	8-Dec	1049.46	47706	1044.85	42498	1036.80	34000	1033.82	31080
343	9-Dec	1048.75	46898	1044.10	41670	1036.05	33250	1033.14	30429
344	10-Dec	1048.05	46090	1043.34	40842	1035.29	32500	1032.46	29777
345	11-Dec	1047.34	45282	1042.57	40013	1034.52	31750	1031.76	29125
346	12-Dec	1046.62	44474	1041.80	39185	1033.74	31000	1031.06	28473
347	13-Dec	1045.90	43666	1041.02	38357	1032.96	30250	1030.35	27821
348	14-Dec	1045.18	42858	1040.24	37528	1032.16	29500	1029.64	27170
349	15-Dec	1044.45	42050	1039.45	36700	1031.36	28750	1028.91	26518
350	16-Dec	1044.45	42050	1039.45	36700	1030.82	28250	1028.19	25866

Tygart J-Date	Date	Rule Curve - Top of Zone B Elevation (ft NAVD88)	Rule Curve - Top of Zone B Storage (ac-ft)	Rule Curve - Top of Zone C Elevation (ft NAVD88)	Rule Curve - Top of Zone C Storage (ac-ft)	Rule Curve - Top of Zone D Elevation (ft NAVD88)	Rule Curve - Top of Zone D Storage (ac-ft)	Rule Curve - Top of Zone E Elevation (ft NAVD88)	Rule Curve - Top of Zone E Storage (ac-ft)
351	17-Dec	1044.45	42050	1039.45	36700	1030.27	27750	1027.45	25214
352	18-Dec	1044.45	42050	1039.45	36700	1029.72	27250	1026.71	24563
353	19-Dec	1044.45	42050	1039.45	36700	1029.17	26750	1025.97	23911
354	20-Dec	1044.45	42050	1039.45	36700	1028.62	26250	1025.22	23259
355	21-Dec	1044.45	42050	1039.45	36700	1028.34	26000	1024.71	22824
356	22-Dec	1044.45	42050	1039.45	36700	1028.06	25750	1024.20	22389
357	23-Dec	1044.45	42050	1039.45	36700	1027.78	25500	1023.69	21954
358	24-Dec	1044.45	42050	1039.45	36700	1027.49	25250	1023.17	21519
359	25-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1022.66	21084
360	26-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1022.40	20867
361	27-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1022.14	20650
362	28-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1021.88	20434
363	29-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1021.62	20217
364	30-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
365	31-Dec	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000
366	same as 31Dec	1044.45	42050	1039.45	36700	1027.21	25000	1021.35	20000

Tygart J-Date	Date	Rule Curve - Top of Zone F Elevation (ft NAVD88)	Rule Curve - Top of Zone F Storage (ac-ft)	Rule Curve - Top of Zone G Elevation (ft NAVD88)	Rule Curve - Top of Zone G Storage (ac-ft)
1	1-Jan	1014.93	15000	1009.45	11200
2	2-Jan	1014.93	15000	1009.45	11200
3	3-Jan	1014.93	15000	1009.45	11200
4	4-Jan	1014.93	15000	1009.45	11200
5	5-Jan	1014.93	15000	1009.45	11200
6	6-Jan	1014.93	15000	1009.45	11200
7	7-Jan	1014.93	15000	1009.45	11200
8	8-Jan	1014.93	15000	1009.45	11200
9	9-Jan	1014.93	15000	1009.45	11200
10	10-Jan	1014.93	15000	1009.45	11200
11	11-Jan	1014.93	15000	1009.45	11200
12	12-Jan	1014.93	15000	1009.45	11200
13	13-Jan	1014.93	15000	1009.45	11200
14	14-Jan	1014.93	15000	1009.45	11200
15	15-Jan	1014.93	15000	1009.45	11200
16	16-Jan	1014.93	15000	1009.45	11200
17	17-Jan	1014.93	15000	1009.45	11200
18	18-Jan	1014.93	15000	1009.45	11200
19	19-Jan	1014.93	15000	1009.45	11200
20	20-Jan	1014.93	15000	1009.45	11200
21	21-Jan	1014.93	15000	1009.45	11200
22	22-Jan	1014.93	15000	1009.45	11200
23	23-Jan	1014.93	15000	1009.45	11200
24	24-Jan	1014.93	15000	1009.45	11200
25	25-Jan	1014.93	15000	1009.45	11200
26	26-Jan	1014.93	15000	1009.45	11200
27	27-Jan	1014.93	15000	1009.45	11200
28	28-Jan	1014.93	15000	1009.45	11200
29	29-Jan	1014.93	15000	1009.45	11200
30	30-Jan	1014.93	15000	1009.45	11200
31	31-Jan	1014.93	15000	1009.45	11200
32	1-Feb	1014.93	15000	1009.45	11200
33	2-Feb	1014.93	15000	1009.45	11200
34	3-Feb	1014.93	15000	1009.45	11200
35	4-Feb	1014.93	15000	1009.45	11200
36	5-Feb	1014.93	15000	1009.45	11200
37	6-Feb	1014.93	15000	1009.45	11200
38	7-Feb	1014.93	15000	1009.45	11200
39	8-Feb	1014.93	15000	1009.45	11200
40	9-Feb	1014.93	15000	1009.45	11200
41	10-Feb	1014.93	15000	1009.45	11200
42	11-Feb	1014.93	15000	1009.45	11200
43	12-Feb	1014.93	15000	1009.45	11200
44	13-Feb	1014.93	15000	1009.45	11200
45	14-Feb	1014.93	15000	1009.45	11200
46	15-Feb	1014.93	15000	1009.45	11200
47	16-Feb	1014.93	15000	1009.45	11200
48	17-Feb	1014.93	15000	1009.45	11200
49	18-Feb	1014.93	15000	1009.45	11200
50	19-Feb	1014.93	15000	1009.45	11200
51	20-Feb	1014.93	15000	1009.45	11200
52	21-Feb	1014.93	15000	1009.45	11200
53	22-Feb	1014.93	15000	1009.45	11200
54	23-Feb	1014.93	15000	1009.45	11200
55	24-Feb	1014.93	15000	1009.45	11200
56	25-Feb	1014.93	15000	1009.45	11200
57	26-Feb	1014.93	15000	1009.45	11200
58	27-Feb	1014.93	15000	1009.45	11200
59	28-Feb	1014.93	15000	1009.45	11200
60	1-Mar	1014.93	15000	1009.45	11200
61	2-Mar	1014.93	15000	1009.45	11200
62	3-Mar	1014.93	15000	1009.45	11200
63	4-Mar	1014.93	15000	1009.45	11200
64	5-Mar	1014.93	15000	1009.45	11200
65	6-Mar	1014.93	15000	1009.45	11200
66	7-Mar	1014.93	15000	1009.45	11200
67	8-Mar	1014.93	15000	1009.45	11200
68	9-Mar	1014.93	15000	1009.45	11200
69	10-Mar	1014.93	15000	1009.45	11200
70	11-Mar	1014.93	15000	1009.45	11200

Tygart J-Date	Date	Rule Curve - Top of Zone F Elevation (ft NAVD88)	Rule Curve - Top of Zone F Storage (ac-ft)	Rule Curve - Top of Zone G Elevation (ft NAVD88)	Rule Curve - Top of Zone G Storage (ac-ft)
71	12-Mar	1014.93	15000	1009.45	11200
72	13-Mar	1014.93	15000	1009.45	11200
73	14-Mar	1014.93	15000	1009.45	11200
74	15-Mar	1014.93	15000	1009.45	11200
75	16-Mar	1014.93	15000	1009.45	11200
76	17-Mar	1014.93	15000	1009.45	11200
77	18-Mar	1014.93	15000	1009.45	11200
78	19-Mar	1014.93	15000	1009.45	11200
79	20-Mar	1014.93	15000	1009.45	11200
80	21-Mar	1017.57	16973	1009.45	11200
81	22-Mar	1020.06	18945	1009.45	11200
82	23-Mar	1022.46	20918	1009.45	11200
83	24-Mar	1024.79	22891	1009.45	11200
84	25-Mar	1027.06	24864	1009.45	11200
85	26-Mar	1029.27	26836	1009.45	11200
86	27-Mar	1031.43	28809	1009.45	11200
87	28-Mar	1033.51	30782	1009.45	11200
88	29-Mar	1035.55	32755	1009.45	11200
89	30-Mar	1037.53	34727	1009.45	11200
90	31-Mar	1039.45	36700	1009.45	11200
91	1-Apr	1041.73	39105	1012.74	13423
92	2-Apr	1043.95	41510	1015.81	15647
93	3-Apr	1046.12	43915	1018.72	17870
94	4-Apr	1048.25	46319	1021.47	20093
95	5-Apr	1050.33	48724	1024.12	22317
96	6-Apr	1052.37	51129	1026.69	24540
97	7-Apr	1054.35	53534	1029.19	26763
98	8-Apr	1056.30	55939	1031.62	28987
99	9-Apr	1058.18	58344	1033.96	31210
100	10-Apr	1060.02	60748	1036.23	33433
101	11-Apr	1061.84	63153	1038.44	35657
102	12-Apr	1063.64	65558	1040.57	37880
103	13-Apr	1065.42	67963	1042.66	40103
104	14-Apr	1067.19	70368	1044.70	42327
105	15-Apr	1068.93	72773	1046.69	44550
106	16-Apr	1070.65	75177	1048.64	46773
107	17-Apr	1072.33	77582	1050.57	48997
108	18-Apr	1073.97	79987	1052.45	51220
109	19-Apr	1075.59	82392	1054.28	53443
110	20-Apr	1077.18	84797	1056.08	55667
111	21-Apr	1078.75	87202	1057.83	57890
112	22-Apr	1080.28	89606	1059.54	60113
113	23-Apr	1081.80	92011	1061.23	62337
114	24-Apr	1083.31	94416	1062.90	64560
115	25-Apr	1084.80	96821	1064.55	66783
116	26-Apr	1086.28	99226	1066.19	69007
117	27-Apr	1087.72	101631	1067.81	71230
118	28-Apr	1089.17	104035	1069.42	73453
119	29-Apr	1090.64	106440	1071.00	75677
120	30-Apr	1092.06	108845	1072.55	77900
121	1-May	1093.45	111250	1074.06	80123
122	2-May	1093.45	111250	1075.56	82347
123	3-May	1093.45	111250	1077.04	84570
124	4-May	1093.45	111250	1078.48	86793
125	5-May	1093.45	111250	1079.91	89017
126	6-May	1093.45	111250	1081.32	91240
127	7-May	1093.45	111250	1082.71	93463
128	8-May	1093.45	111250	1084.10	95687
129	9-May	1093.45	111250	1085.47	97910
130	10-May	1093.45	111250	1086.84	100133
131	11-May	1093.45	111250	1088.11	102357
132	12-May	1093.45	111250	1089.53	104580
133	13-May	1093.45	111250	1090.85	106803
134	14-May	1093.45	111250	1092.16	109027
135	15-May	1093.45	111250	1093.45	111250
136	16-May	1093.45	111250	1093.45	111250
137	17-May	1093.45	111250	1093.45	111250
138	18-May	1093.45	111250	1093.45	111250
139	19-May	1093.45	111250	1093.45	111250
140	20-May	1093.45	111250	1093.45	111250

Tygart J-Date	Date	Rule Curve - Top of Zone F Elevation (ft NAVD88)	Rule Curve - Top of Zone F Storage (ac-ft)	Rule Curve - Top of Zone G Elevation (ft NAVD88)	Rule Curve - Top of Zone G Storage (ac-ft)
141	21-May	1093.45	111250	1093.45	111250
142	22-May	1093.45	111250	1093.45	111250
143	23-May	1093.45	111250	1093.45	111250
144	24-May	1093.45	111250	1093.45	111250
145	25-May	1093.45	111250	1093.45	111250
146	26-May	1093.45	111250	1093.45	111250
147	27-May	1093.45	111250	1093.45	111250
148	28-May	1093.45	111250	1093.45	111250
149	29-May	1093.45	111250	1093.45	111250
150	30-May	1093.45	111250	1093.45	111250
151	31-May	1093.45	111250	1093.45	111250
152	1-Jun	1093.45	111250	1093.45	111250
153	2-Jun	1093.45	111250	1093.45	111250
154	3-Jun	1093.45	111250	1093.45	111250
155	4-Jun	1093.45	111250	1093.45	111250
156	5-Jun	1093.45	111250	1093.45	111250
157	6-Jun	1093.45	111250	1093.45	111250
158	7-Jun	1093.45	111250	1093.45	111250
159	8-Jun	1093.45	111250	1093.45	111250
160	9-Jun	1093.45	111250	1093.45	111250
161	10-Jun	1093.45	111250	1093.45	111250
162	11-Jun	1093.45	111250	1093.45	111250
163	12-Jun	1093.45	111250	1093.45	111250
164	13-Jun	1093.45	111250	1093.45	111250
165	14-Jun	1093.45	111250	1093.45	111250
166	15-Jun	1093.45	111250	1093.45	111250
167	16-Jun	1093.45	111250	1093.45	111250
168	17-Jun	1093.45	111250	1093.45	111250
169	18-Jun	1093.45	111250	1093.45	111250
170	19-Jun	1093.45	111250	1093.45	111250
171	20-Jun	1093.45	111250	1093.45	111250
172	21-Jun	1093.45	111250	1093.45	111250
173	22-Jun	1093.45	111250	1093.45	111250
174	23-Jun	1093.45	111250	1093.45	111250
175	24-Jun	1093.45	111250	1093.45	111250
176	25-Jun	1093.45	111250	1093.45	111250
177	26-Jun	1093.45	111250	1093.45	111250
178	27-Jun	1093.45	111250	1093.45	111250
179	28-Jun	1093.45	111250	1093.45	111250
180	29-Jun	1093.45	111250	1093.45	111250
181	30-Jun	1093.45	111250	1093.45	111250
182	1-Jul	1093.45	111250	1093.45	111250
183	2-Jul	1093.45	111250	1093.45	111250
184	3-Jul	1093.45	111250	1093.45	111250
185	4-Jul	1093.45	111250	1093.45	111250
186	5-Jul	1093.45	111250	1093.45	111250
187	6-Jul	1093.45	111250	1093.45	111250
188	7-Jul	1093.45	111250	1093.45	111250
189	8-Jul	1093.45	111250	1093.45	111250
190	9-Jul	1093.45	111250	1093.45	111250
191	10-Jul	1093.45	111250	1093.45	111250
192	11-Jul	1093.45	111250	1093.12	110675
193	12-Jul	1093.45	111250	1092.79	110100
194	13-Jul	1093.45	111250	1092.45	109525
195	14-Jul	1093.45	111250	1092.12	108950
196	15-Jul	1093.45	111250	1091.78	108375
197	16-Jul	1093.12	110675	1091.44	107800
198	17-Jul	1092.79	110100	1091.10	107225
199	18-Jul	1092.45	109525	1090.76	106650
200	19-Jul	1092.12	108950	1090.42	106075
201	20-Jul	1091.78	108375	1090.08	105500
202	21-Jul	1091.44	107800	1089.73	104925
203	22-Jul	1091.10	107225	1089.38	104350
204	23-Jul	1090.76	106650	1088.99	103775
205	24-Jul	1090.42	106075	1088.61	103200
206	25-Jul	1090.08	105500	1088.26	102625
207	26-Jul	1089.73	104925	1087.95	102050
208	27-Jul	1089.38	104350	1087.63	101475
209	28-Jul	1088.99	103775	1087.30	100900
210	29-Jul	1088.61	103200	1086.95	100325

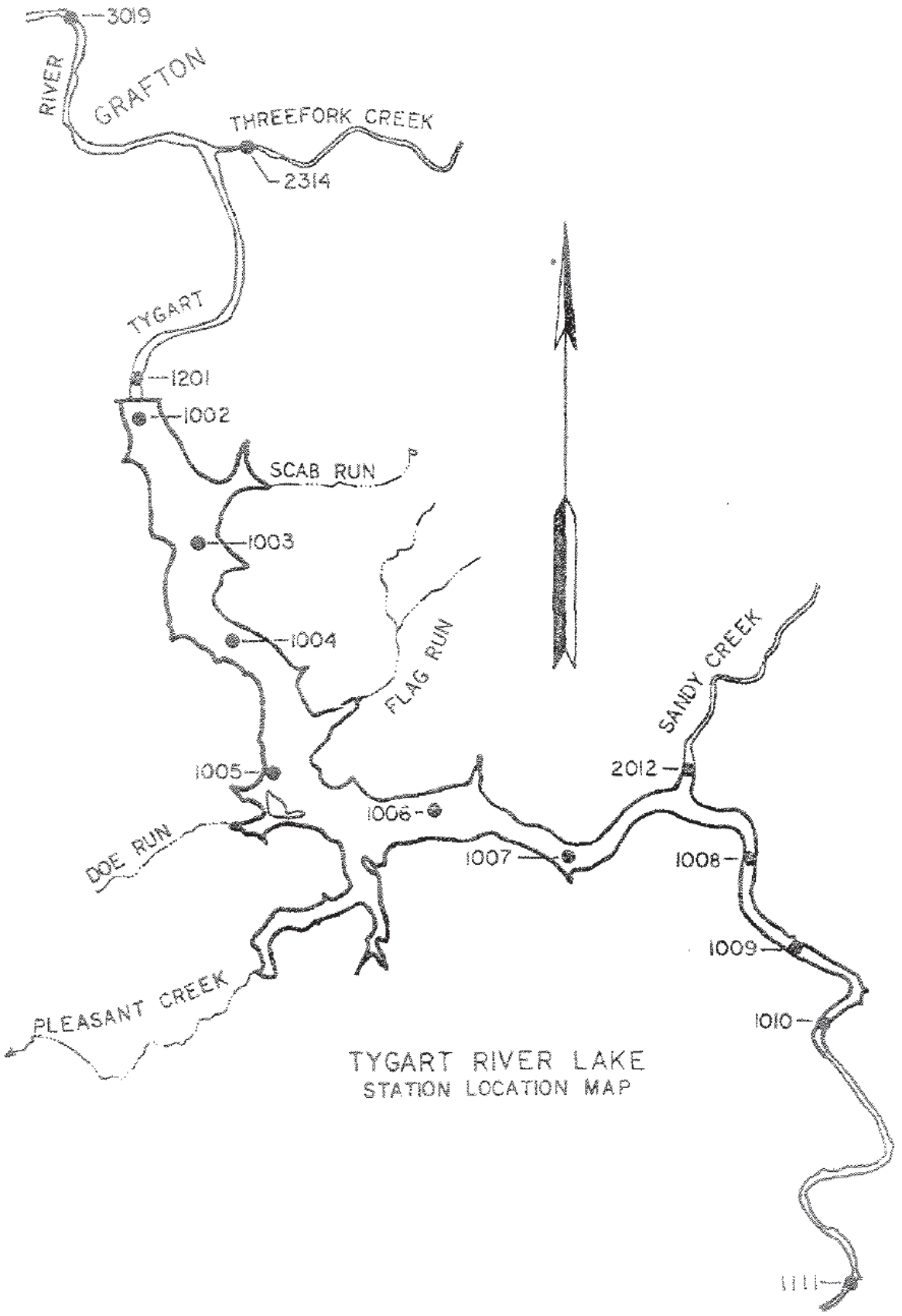
Tygart J-Date	Date	Rule Curve - Top of Zone F Elevation (ft NAVD88)	Rule Curve - Top of Zone F Storage (ac-ft)	Rule Curve - Top of Zone G Elevation (ft NAVD88)	Rule Curve - Top of Zone G Storage (ac-ft)
211	30-Jul	1088.26	102625	1086.60	99750
212	31-Jul	1087.95	102050	1086.25	99175
213	1-Aug	1087.63	101475	1085.90	98600
214	2-Aug	1087.30	100900	1085.55	98025
215	3-Aug	1086.95	100325	1085.19	97450
216	4-Aug	1086.60	99750	1084.84	96875
217	5-Aug	1086.25	99175	1084.48	96300
218	6-Aug	1085.90	98600	1084.12	95725
219	7-Aug	1085.55	98025	1083.77	95150
220	8-Aug	1085.19	97450	1083.41	94575
221	9-Aug	1084.84	96875	1083.05	94000
222	10-Aug	1084.48	96300	1082.69	93425
223	11-Aug	1084.12	95725	1082.33	92850
224	12-Aug	1083.77	95150	1081.97	92275
225	13-Aug	1083.41	94575	1081.61	91700
226	14-Aug	1083.05	94000	1081.24	91125
227	15-Aug	1082.69	93425	1080.88	90550
228	16-Aug	1082.33	92850	1080.52	89975
229	17-Aug	1081.97	92275	1080.15	89400
230	18-Aug	1081.61	91700	1079.78	88825
231	19-Aug	1081.24	91125	1079.42	88250
232	20-Aug	1080.88	90550	1079.05	87675
233	21-Aug	1080.52	89975	1078.68	87100
234	22-Aug	1080.15	89400	1078.31	86525
235	23-Aug	1079.78	88825	1077.94	85950
236	24-Aug	1079.42	88250	1077.56	85375
237	25-Aug	1079.05	87675	1077.19	84800
238	26-Aug	1078.68	87100	1076.81	84225
239	27-Aug	1078.31	86525	1076.43	83650
240	28-Aug	1077.94	85950	1076.05	83075
241	29-Aug	1077.56	85375	1075.66	82500
242	30-Aug	1077.19	84800	1075.28	81925
243	31-Aug	1076.81	84225	1074.89	81350
244	1-Sep	1076.43	83650	1074.51	80775
245	2-Sep	1076.05	83075	1074.12	80200
246	3-Sep	1075.66	82500	1073.73	79625
247	4-Sep	1075.28	81925	1073.33	79050
248	5-Sep	1074.89	81350	1072.94	78475
249	6-Sep	1074.51	80775	1072.55	77900
250	7-Sep	1074.12	80200	1072.15	77325
251	8-Sep	1073.73	79625	1071.75	76750
252	9-Sep	1073.33	79050	1071.35	76175
253	10-Sep	1072.94	78475	1070.94	75600
254	11-Sep	1072.55	77900	1070.54	75025
255	12-Sep	1072.15	77325	1070.13	74450
256	13-Sep	1071.75	76750	1069.72	73875
257	14-Sep	1071.35	76175	1069.31	73300
258	15-Sep	1070.94	75600	1068.89	72725
259	16-Sep	1070.54	75025	1068.48	72150
260	17-Sep	1070.13	74450	1068.06	71575
261	18-Sep	1069.72	73875	1067.65	71000
262	19-Sep	1069.31	73300	1067.23	70425
263	20-Sep	1068.89	72725	1066.81	69850
264	21-Sep	1068.48	72150	1066.39	69275
265	22-Sep	1068.06	71575	1065.96	68700
266	23-Sep	1067.65	71000	1065.54	68125
267	24-Sep	1067.23	70425	1065.12	67550
268	25-Sep	1066.81	69850	1064.69	66975
269	26-Sep	1066.39	69275	1064.26	66400
270	27-Sep	1065.96	68700	1063.84	65825
271	28-Sep	1065.54	68125	1063.41	65250
272	29-Sep	1065.12	67550	1062.98	64675
273	30-Sep	1064.69	66975	1062.55	64100
274	1-Oct	1064.26	66400	1062.12	63525
275	2-Oct	1063.84	65825	1061.69	62950
276	3-Oct	1063.41	65250	1061.26	62375
277	4-Oct	1062.98	64675	1060.82	61800
278	5-Oct	1062.55	64100	1060.39	61225
279	6-Oct	1062.12	63525	1059.95	60650
280	7-Oct	1061.69	62950	1059.51	60075

Tygart J-Date	Date	Rule Curve - Top of Zone F Elevation (ft NAVD88)	Rule Curve - Top of Zone F Storage (ac-ft)	Rule Curve - Top of Zone G Elevation (ft NAVD88)	Rule Curve - Top of Zone G Storage (ac-ft)
281	8-Oct	1061.26	62375	1059.07	59500
282	9-Oct	1060.82	61800	1058.63	58925
283	10-Oct	1060.39	61225	1058.19	58350
284	11-Oct	1059.95	60650	1057.74	57775
285	12-Oct	1059.51	60075	1057.29	57200
286	13-Oct	1059.07	59500	1056.84	56625
287	14-Oct	1058.63	58925	1056.39	56050
288	15-Oct	1058.19	58350	1055.93	55475
289	16-Oct	1057.74	57775	1055.47	54900
290	17-Oct	1057.29	57200	1055.00	54325
291	18-Oct	1056.84	56625	1054.53	53750
292	19-Oct	1056.39	56050	1054.06	53175
293	20-Oct	1055.93	55475	1053.59	52600
294	21-Oct	1055.47	54900	1053.12	52025
295	22-Oct	1055.00	54325	1052.64	51450
296	23-Oct	1054.53	53750	1052.16	50875
297	24-Oct	1054.06	53175	1051.68	50300
298	25-Oct	1053.59	52600	1051.19	49725
299	26-Oct	1053.12	52025	1050.70	49150
300	27-Oct	1052.64	51450	1050.20	48575
301	28-Oct	1052.16	50875	1049.71	48000
302	29-Oct	1051.68	50300	1049.21	47425
303	30-Oct	1051.19	49725	1048.71	46850
304	31-Oct	1050.70	49150	1048.21	46275
305	1-Nov	1050.20	48575	1047.70	45700
306	2-Nov	1049.71	48000	1047.20	45125
307	3-Nov	1049.21	47425	1046.69	44550
308	4-Nov	1048.71	46850	1046.18	43975
309	5-Nov	1048.21	46275	1045.66	43400
310	6-Nov	1047.70	45700	1045.15	42825
311	7-Nov	1047.20	45125	1044.63	42250
312	8-Nov	1046.69	44550	1044.11	41675
313	9-Nov	1046.18	43975	1043.58	41100
314	10-Nov	1045.66	43400	1043.05	40525
315	11-Nov	1045.15	42825	1042.51	39950
316	12-Nov	1044.63	42250	1041.98	39375
317	13-Nov	1044.11	41675	1041.44	38800
318	14-Nov	1043.58	41100	1040.90	38225
319	15-Nov	1043.05	40525	1040.35	37650
320	16-Nov	1042.51	39950	1039.81	37075
321	17-Nov	1041.98	39375	1039.26	36500
322	18-Nov	1041.44	38800	1038.70	35925
323	19-Nov	1040.90	38225	1038.14	35350
324	20-Nov	1040.35	37650	1037.57	34775
325	21-Nov	1039.81	37075	1037.00	34200
326	22-Nov	1039.26	36500	1036.42	33625
327	23-Nov	1038.70	35925	1035.84	33050
328	24-Nov	1038.14	35350	1035.26	32475
329	25-Nov	1037.57	34775	1034.67	31900
330	26-Nov	1037.00	34200	1034.08	31325
331	27-Nov	1036.42	33625	1033.48	30750
332	28-Nov	1035.84	33050	1032.88	30175
333	29-Nov	1035.26	32475	1032.27	29600
334	30-Nov	1034.67	31900	1031.66	29025
335	1-Dec	1034.08	31325	1031.04	28450
336	2-Dec	1033.48	30750	1030.41	27875
337	3-Dec	1032.88	30175	1029.78	27300
338	4-Dec	1032.27	29600	1029.14	26725
339	5-Dec	1031.66	29025	1028.51	26150
340	6-Dec	1031.04	28450	1027.86	25575
341	7-Dec	1030.41	27875	1027.21	25000
342	8-Dec	1029.78	27300	1026.56	24425
343	9-Dec	1029.14	26725	1025.90	23850
344	10-Dec	1028.51	26150	1025.23	23275
345	11-Dec	1027.86	25575	1024.57	22700
346	12-Dec	1027.21	25000	1023.89	22125
347	13-Dec	1026.56	24425	1023.21	21550
348	14-Dec	1025.90	23850	1022.53	20975
349	15-Dec	1025.23	23275	1021.84	20400
350	16-Dec	1024.57	22700	1021.14	19825

Tygart J-Date	Date	Rule Curve - Top of Zone F Elevation (ft NAVD88)	Rule Curve - Top of Zone F Storage (ac-ft)	Rule Curve - Top of Zone G Elevation (ft NAVD88)	Rule Curve - Top of Zone G Storage (ac-ft)
351	17-Dec	1023.89	22125	1020.44	19250
352	18-Dec	1023.21	21550	1019.73	18675
353	19-Dec	1022.53	20975	1019.01	18100
354	20-Dec	1021.84	20400	1018.28	17525
355	21-Dec	1021.14	19825	1017.54	16950
356	22-Dec	1020.44	19250	1016.79	16375
357	23-Dec	1019.73	18675	1016.02	15800
358	24-Dec	1019.01	18100	1015.24	15225
359	25-Dec	1018.28	17525	1014.45	14650
360	26-Dec	1017.54	16950	1013.65	14075
361	27-Dec	1016.79	16375	1012.84	13500
362	28-Dec	1016.02	15800	1012.02	12925
363	29-Dec	1015.24	15225	1011.18	12350
364	30-Dec	1014.93	15000	1010.32	11775
365	31-Dec	1014.93	15000	1009.45	11200
366	same as 31Dec	1014.93	15000	1009.45	11200

1100
1090
1080
1070
1060
1050
1040
RESERVOIR POOL ELEVATION IN FEET ABOVE M.S.L.
SUMMER POOL - ELEV. 1094
BASED ON YEARS 1939 - 1976
WET YEAR
NORMAL YEAR
DRY YEAR
MAY
JUNE
JULY
AUG.
SEP.
OCT.
TYGART LAKE
RESERVOIR DRAWDOWN
DURING
RECREATION SEASON
U.S. ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY: WWB
CHECKED BY:
NOV. 1976

PLATE 11

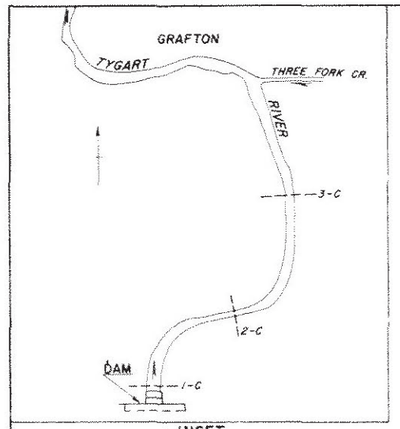


TYGART RIVER LAKE
STATION LOCATION MAP

MOATSVILLE
PLATE 12

CORPS OF ENGINEERS

U. S. ARMY



INSET

1973 SEDIMENTATION *

VOLUMES IN ACRE FEET

SEGMENT	SEDIMENT	EROSION
1	20.98	0.65
2	442.07	23.54
3	423.14	127.71
4	13.72	21.88
5	225.69	119.42
6	1.45	4.39
7	204.27	88.69
8	1.80	4.12
9	355.23	49.16
10	234.32	570.31
11	0.02	1.24
12	360.34	144.13
13	27.43	14.63
14	3.38	4.55
15	191.29	88.89
16	0.79	4.58
17	604.16	114.38
18	629.72	54.76
19	405.50	8.39
20	17.33	0.42
21	441.89	23.64
22	276.32	21.30
23	28.38	6.43
24	366.55	0.98
25	82.57	0.69
26	301.40	49.59
27	21.10	8.93
28	96.86	65.48
29	30.53	63.60
30	30.70	30.39
31	11.22	85.82
32	21.37	203.19
33	8.61	30.14
34	0.0	0.0
35	0.0	0.0
36	101.27	16.45
37	106.31	4.91
38	42.81	0.0
39	87.61	1.65
40	98.20	1.25
41	3.71	0.16
42	0.0	0.0
43	0.0	0.0
44	0.0	0.0
45	0.0	0.0
46	0.0	0.0
47	0.0	0.0
TOTALS	6320.04	2060.44

* TENTATIVE

6320.04 ACRE FEET OF SEDIMENT WITHIN LAKE
MINUS 2060.44 " " " EROSION " "
EQUALS 4259.60 " " " SEDIMENT FROM OUTSIDE LAKE

LEGEND

△ MONUMENTED TRAVERSE STATION OF ORIGINAL SURVEY, MADE 1934

⊙ PERMANENT MARK OF RANGE FOR SED. SURVEYS, SET 1944-1959

4-A MEASURED RANGE

(5) SEGMENT NUMBER

#2 SEDIMENT SAMPLE

SEDIMENT DISTRIBUTION 0 TO 5 FEET THICK

" " 5 " 10 " "

" " 10 " 16 " "

EROSION

NOTES

THE STORAGE OF WATER BEGAN OCTOBER 1937.

THIS IS THE THIRD MEASUREMENT OF SEDIMENTATION. THE SECOND WAS COMPLETED IN MARCH 1959 AND THE FIRST IN NOVEMBER 1945.

DURING THIS MAY 1973 FIELD SURVEY STEEL H BEAMS WERE PLACED CLOSER TO THE LAKE THAN THE EXISTING ORIGINAL MONUMENTS.

NO APPRECIABLE SEDIMENT WAS FOUND IN RANGES 34, 35 AND 41 THRU 46 DURING THIS PRESENT SURVEY. EXTENSIVE BANK EROSION IS EVIDENCED THROUGHOUT THE LAKE ABOVE MINIMUM POOL ELEVATION 1010.0. LARGE QUANTITIES OF SEDIMENT HAVE DEVELOPED IN THE LOWER ELEVATIONS.

IN 1961, TWO YEARS AFTER THE LAST SEDIMENTATION REPORT, THE WEST VIRGINIA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WILDLIFE RESOURCES CONSTRUCTED A DAM 500 FEET DOWNSTREAM OF RANGE 14-B. THE DAM WHICH IS NAMED DOE RUN WATERFOWL IMPOUNDMENT IS OF CONCRETE CONSTRUCTION WITH A FIXED WEIR ELEVATION OF 1095.7. THE LAKE FORMED BY THE DAM IS APPROXIMATELY 144 ACRE FEET.

THIS IS THE FIRST TIME THREE CLASS "C" RANGES WERE ESTABLISHED AND SOUNDED BELOW THE DAM. THERE IS NO OLD TOPOGRAPHY AVAILABLE TO SHOW A COMPARISON TO THIS 1973 SURVEY.

TYGART RIVER LAKE
SEDIMENTATION SURVEY
PLAN OF RANGES AND SEDIMENT ACCUMULATION

IN 1 SHEET

SCALE: 1"=1000'

1000 0 1000 2000 3000 4000 5000

PITTSBURGH DISTRICT, PITTSBURGH, PA.

SUBMITTED: Thomas E. Taylor, CHIEF, SURVEY BRANCH

APPROVAL RECOMMENDED: J. S. Marcotte, CHIEF, ENGINEERING DIVISION

APPROVED: W. H. Graves, COLONEL, CORPS OF ENGINEERS, DISTRICT ENGINEER

PREPARED BY W.S.
DRAWN BY C. W. G.
TRACED BY C. W. G.

FILE NO. 037c-UR3-10/26

PLATE 13

NOTE: THIS CURVE IS APPLICABLE TO THE MONONGAHELA, TYGART AND WEST FORK RIVERS FROM THE UPSTREAM LIMITS OF FAIRMONT, W.VA., TO THE PA.-W.VA. STATE LINE.
FLOOD STAGE
LOWER GAGE HEIGHT MORGANTOWN (MD) = ZERO DATUM = 722.0 FEET M.S.L.
35
30
25
20
15
10
0
0
2
DIRECT DAMAGE IN MILLIONS OF DOLLARS - NOV. 1973 VALUES
TYGART LAKE
STAGE-DAMAGE CURVE
UPPER MONONGAHELA RIVER
DAMAGE DISTRICT
U.S. ARMY ENGR DIST. PITTSBURGH, PA
DRAWN BY WRM
CHECKED BY
NOV. 1974

PLATE 14

NOTE: THIS CURVE IS APPLICABLE TO THE MONONGAHELA RIVER FROM THE PA.-W.VA. STATE LINE TO U/D 4.
FLOOD STAGE
LOWER TAGE HEIGHT, MAXWELL LPA - ZERO DATUM = TENTH FEET ABOVE M.S.L.
DIRECT DAMAGE IN MILLIONS OF DOLLARS - NOV. 1973 VALUES
0
5
10
15
20
25
30
35
40
45
50
55
60
65
TYGART LAKE
STAGE-DAMAGE CURVE
MIDDLE MONONGAHELA RIVER
DAMAGE DISTRICT
U.S. ARMY ENGR. DIST. PITTSBURGH, PA.
DRAWN BY: WWM
CHECKED BY: FYR
NOV. 1974

PLATE 15

FLOOD STAGE, HEIGHT, IN FEET, MONONGAHELA RIVER ZERO DATUM = 715.4 MSL
DIRECT DAMAGE IN MILLIONS OF DOLLARS - MAY 1973 VALUES
NOTE: THIS CURVE IS APPLICABLE TO THE MONONGAHELA RIVER 1.2 M TO 1.0 M
TYGART LAKE
STAGE-DAMAGE CURVE
MAKEESPORT DAMAGE DISTRICT
U.S. ARMY ENGR DIST. PITTSBURGH, PA
DRAWN BY: WWA
CHECKED BY: EAS
NOV 1976

PLATE 14

140
160
180
200
220
CURVE EXTENSION
DETAILED CURVE
120
140
148
GAGE HEIGHT IN FEET AT PITTSBURGH POINT (ZERO DATUM = 670.0)
20
30
40
50
0
500
1000
1500
2000
THOUSANDS OF DOLLARS
0
20
40
60
80
100
DIRECT DAMAGE IN MILLIONS OF DOLLARS - AUG. 1963 VALUES
TYGART LAKE
STAGE-DAMAGE CURVE
PITTSBURGH DAMAGE DISTRICT
U.S. ARMY ENGR. DIST. PITTSBURGH, PA
DRAWN BY WWM
CHECKED BY
NOV. 1976

PLATE 12

CURVE EXTENSION
DETAIL CURVE
GAGE HEIGHT IN FEET-UPPER GAGE MONTGOMERY L+D ZERO DATUM (MSL)
THOUSANDS OF DOLLARS
DIRECT DAMAGE IN MILLIONS OF DOLLARS - AUG. 1963 VALUES
TYGART LAKE
STAGE-DAMAGE CURVE
MONTGOMERY DAMAGE DISTRICT
U.S. ARMY ENGR. DIST. PITTSBURGH, PA.
DRAWN BY: WWR
CHECKED BY:
NOV. 1976

PLATE 18

STAGE HEIGHT IN FEET ABOVE LOWER GAGE IN CUMBERLAND (ELEV. 617.5 FT. M.S.L.D.)
CURVE EXTENSION
DETAIL CURVE
THOUSANDS OF DOLLARS
DIRECT DAMAGE IN MILLIONS OF DOLLARS
TYGART LAKE
STAGE - DAMAGE CURVE
NEW CUMBERLAND DAMAGE DISTRICT
U.S. ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY: WDM
CHECKED BY: [illegible]
NOV 1976

PLATE 19

PIKE ISLAND UPPER GAGE HEIGHT IN FEET (ZERO DATUM = 732 FT. M.S.L.)
DETAIL CURVE
DIRECT DAMAGE IN MILLIONS OF DOLLARS
TYGART LAKE
STAGE-DAMAGE CURVE
WHEELING DAMAGE DISTRICT
U.S. ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY: WWM
CHECKED BY:
NOV 1976

PLATE 20

HANNIBAL TOWER GAGE HEIGHT IN FEET (ZERO DATUM = 690.0 FT. MSL)
DETAIL CURVE
0
100
200
300
THOUSANDS OF DOLLARS
DIRECT DAMAGE IN MILLIONS OF DOLLARS
TYGART LAKE
STAGE-DAMAGE CURVE
HANNIBAL DAMAGE DISTRICT
U.S. ARMY, ENGR. DIST., PITTSBURGH, PA.
DRAWN BY: WVM
CHECKED BY:
NOV 1976

PLATE 21

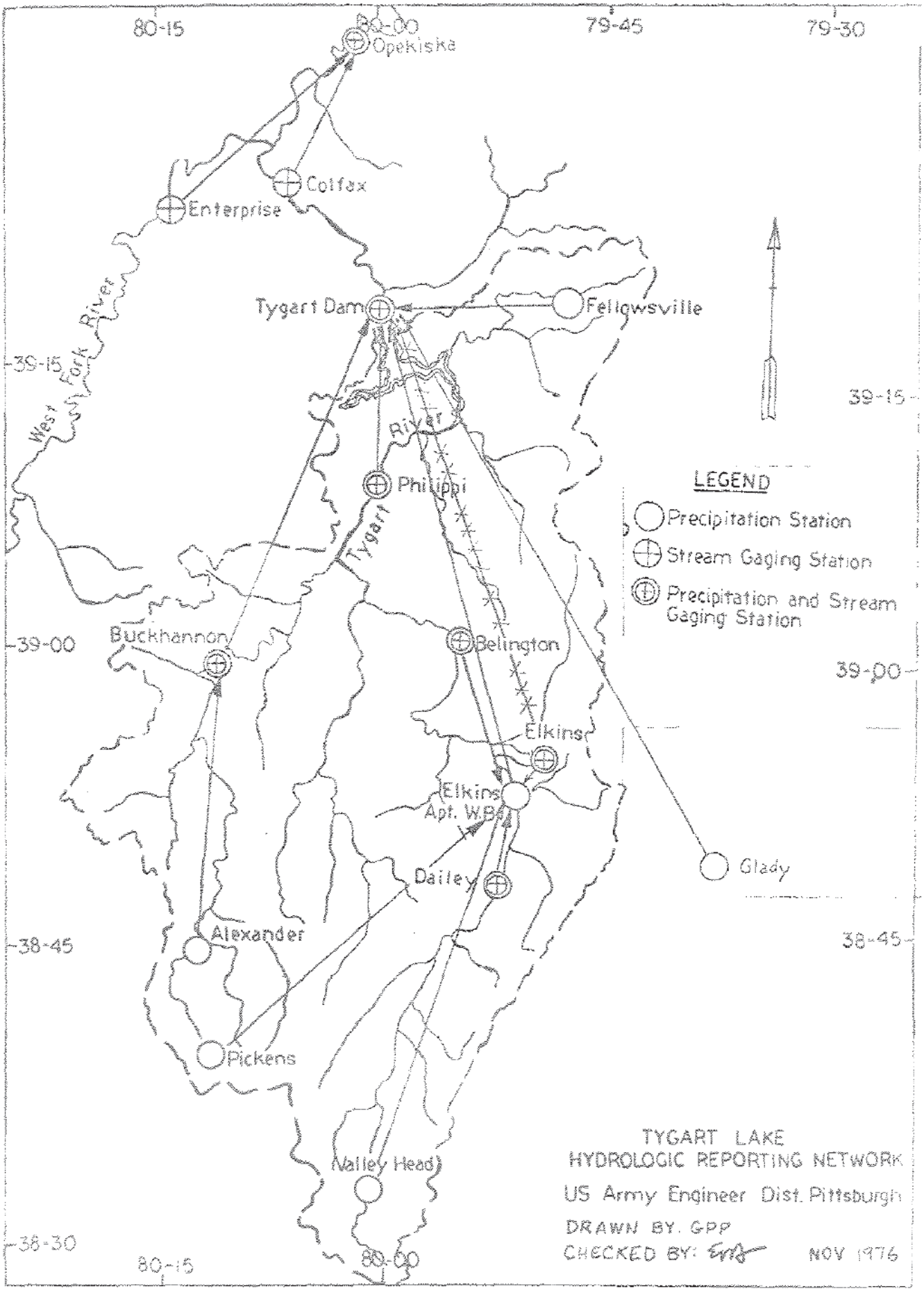
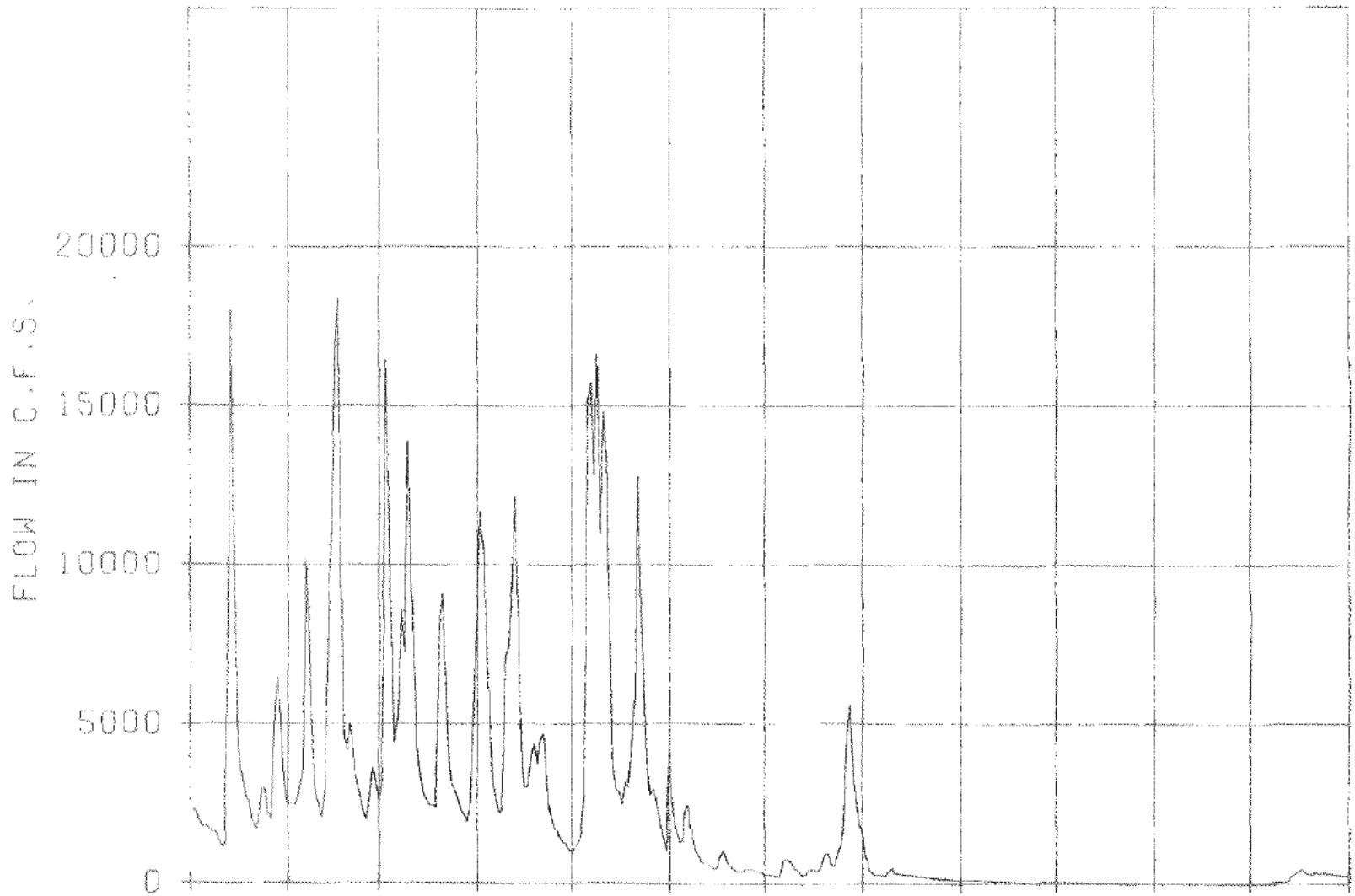

80-15
80-00
79-45
79-30
Opekiska
Colfax
Enterprise
West Fork River
Tygart Dam
Fellowsville
39-15
River
Philippi
Tygart
LEGEND
Precipitation Station
Stream Gaging Station
Precipitation and Stream Gaging Station
Buckhannon
Belington
39-00
Elkins
Elkins Apt. WBAS
Glady
Dailey
Alexander
38-45
Pickens
Valley Head
38-30
TYGART LAKE
HYDROLOGIC REPORTING NETWORK
US Army Engineer Dist. Pittsburgh
DRAWN BY. GPP
CHECKED BY:
NOV 1976

PLATE 22

TYGART RIVER AT DAMSITE



YEAR 1908

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-1

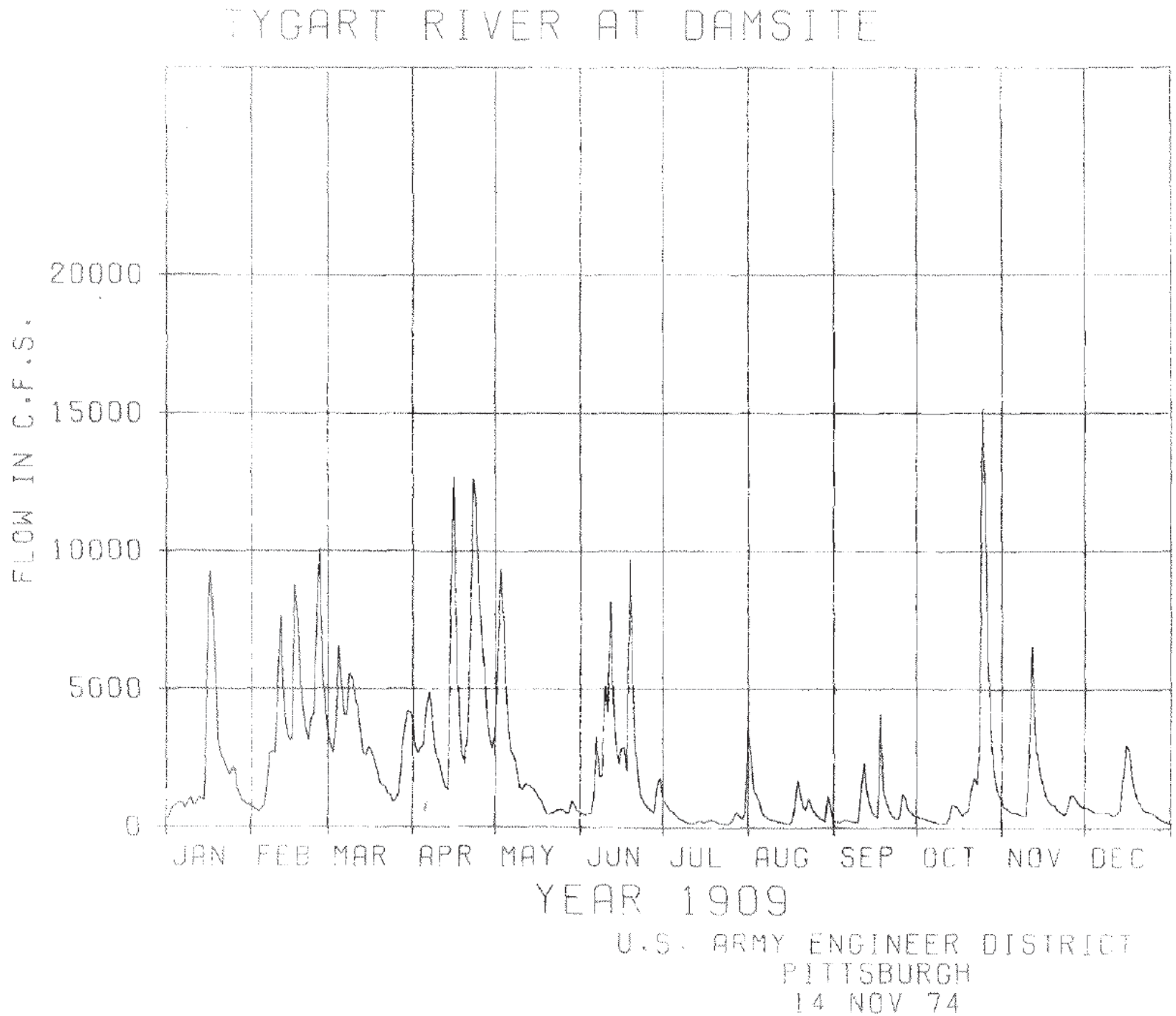
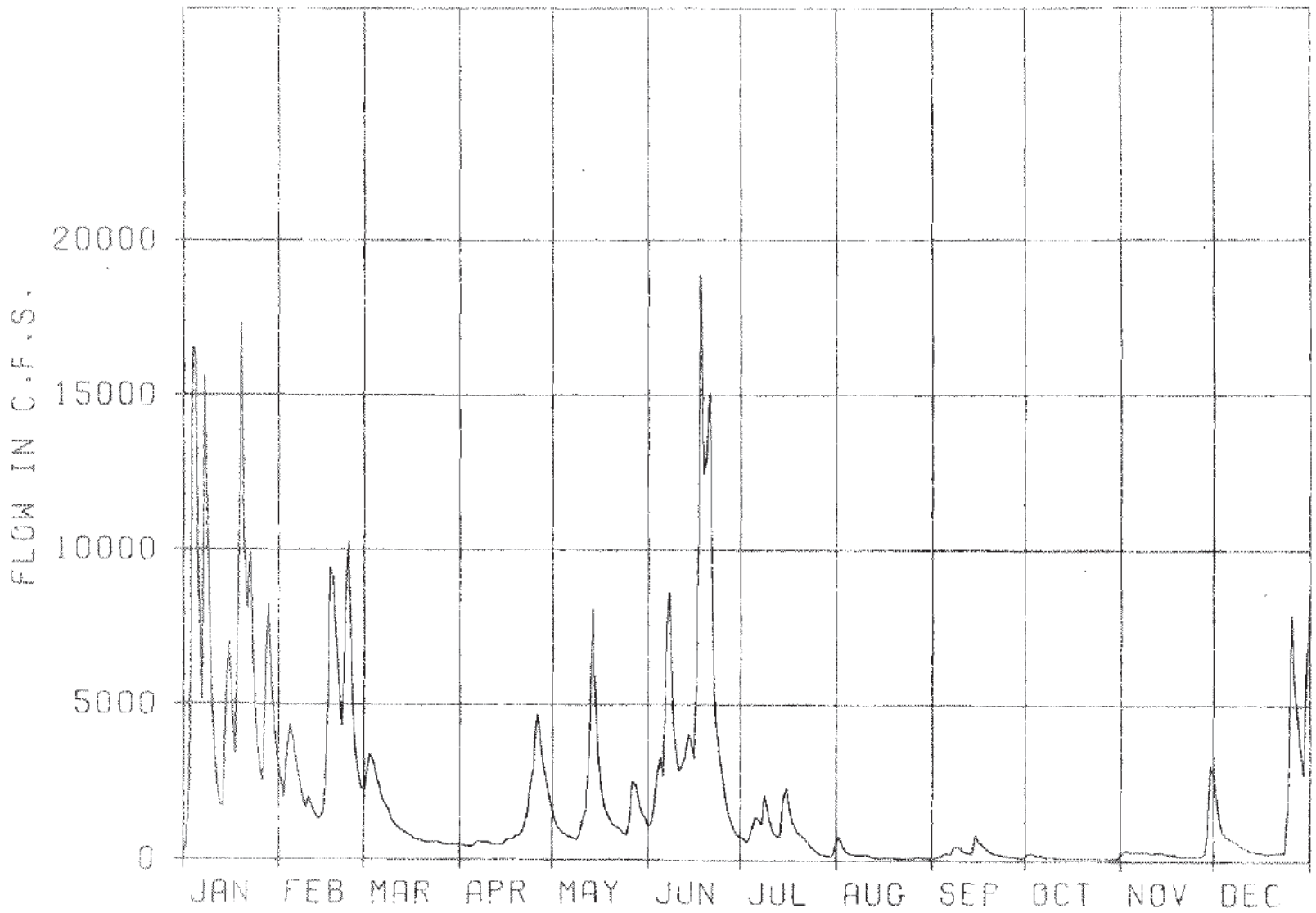

TYGART RIVER AT DAMSITE
20000
15000
10000
5000
0
FLOW IN C.F.S.
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1909
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-2

TYGART RIVER AT DAMSITE

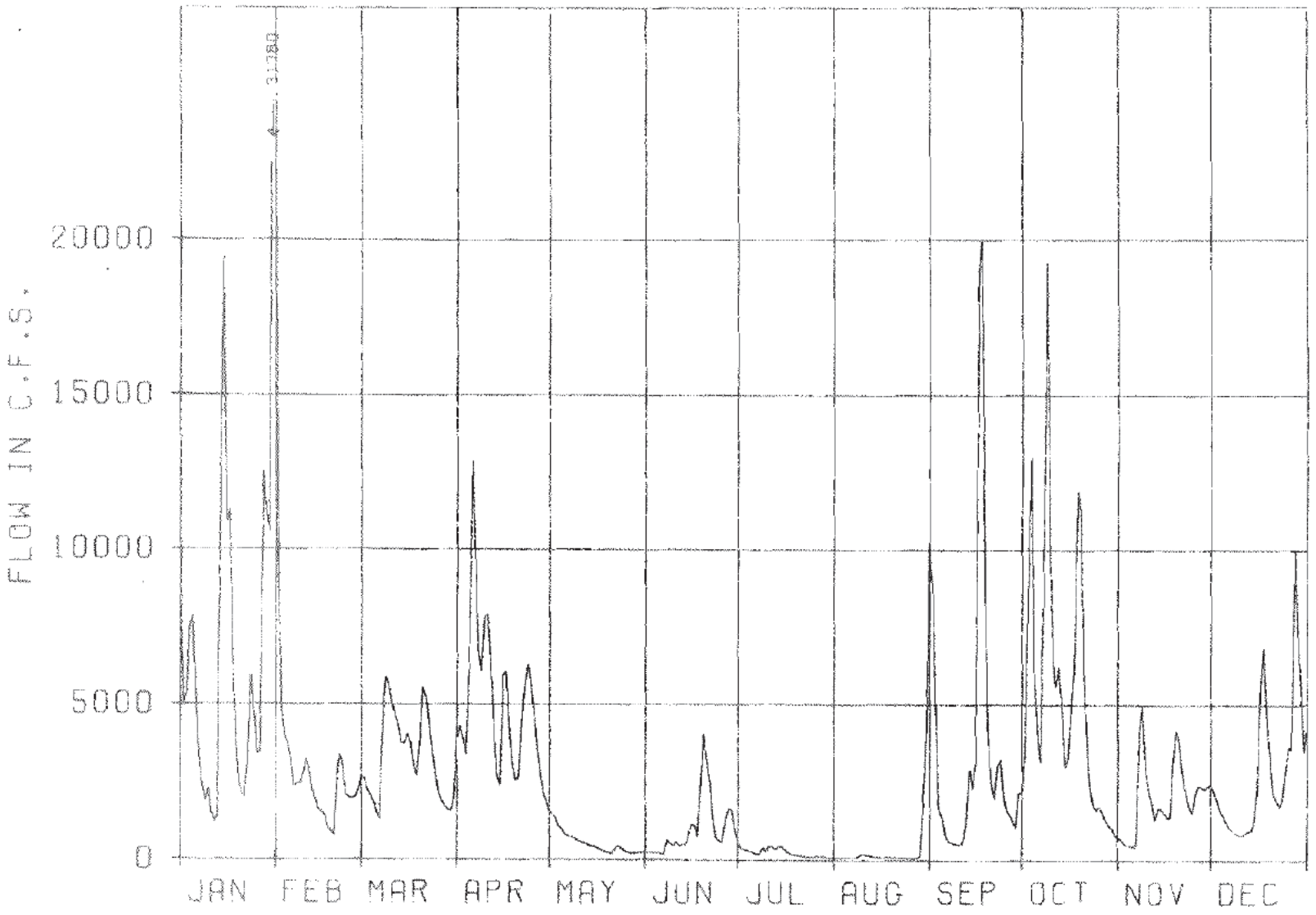


YEAR 1910

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-3

TYGART RIVER AT DAMSITE

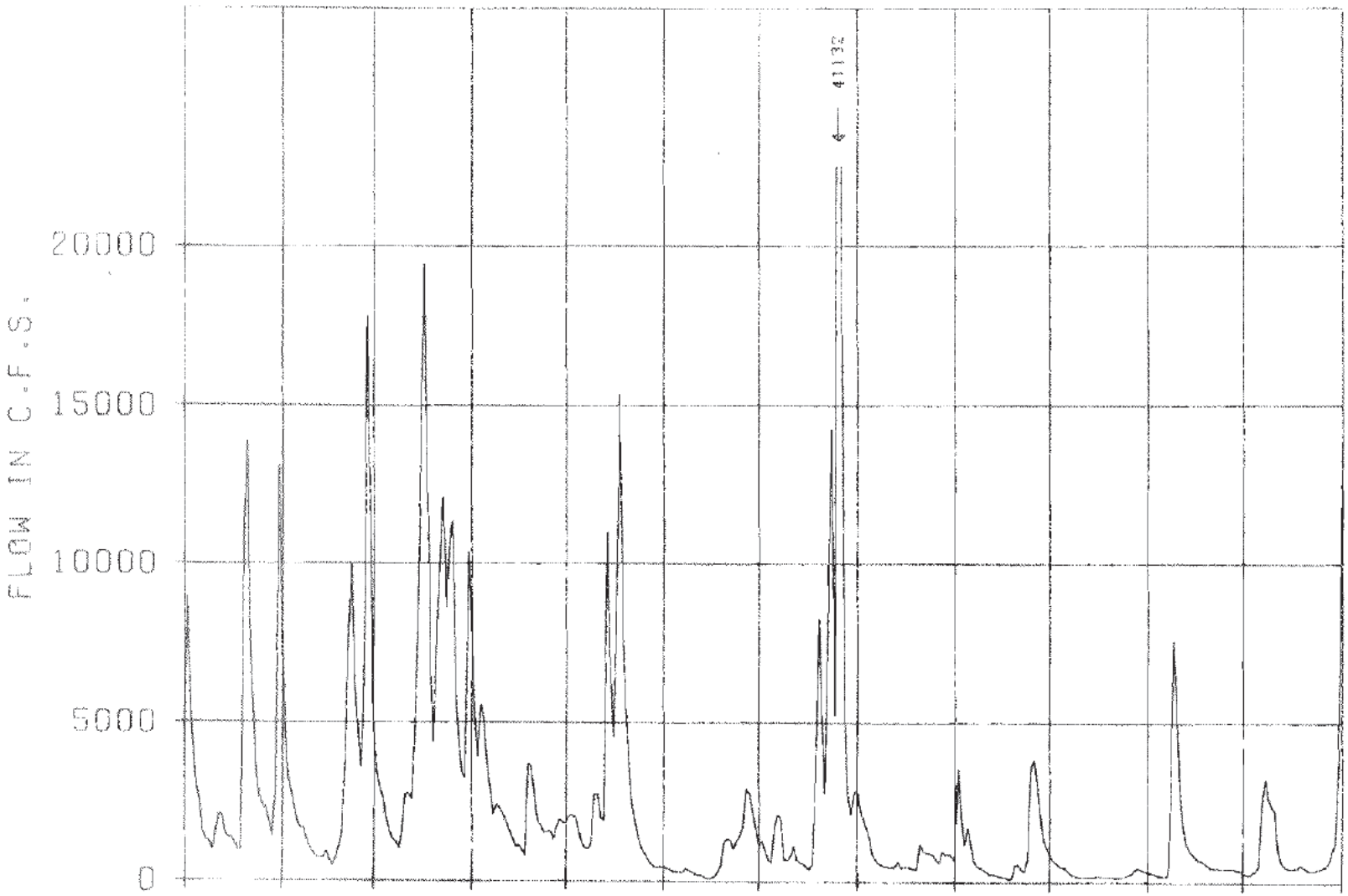


YEAR 1911

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-4

TYGART RIVER AT DAMSITE

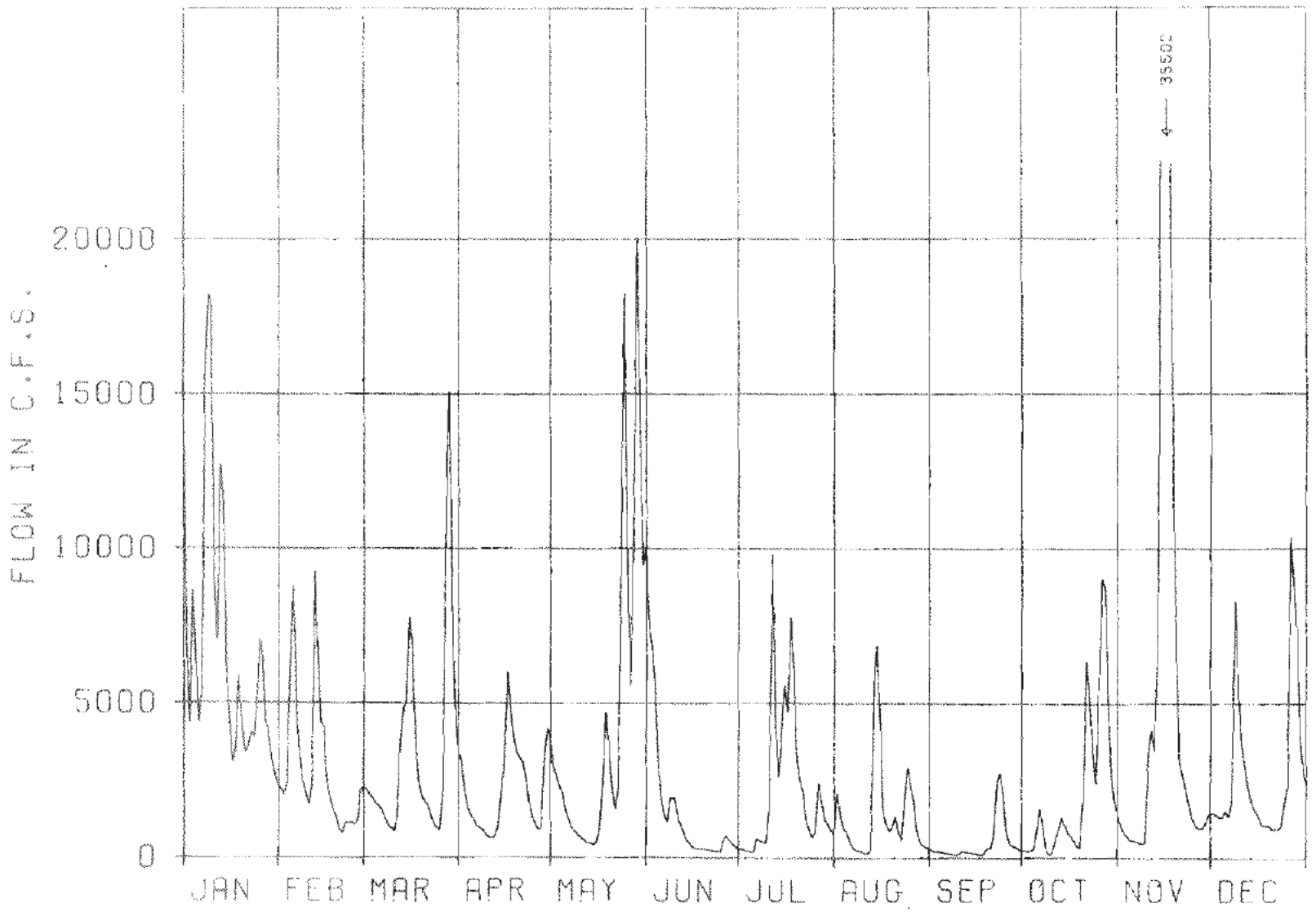


YEAR 1912

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-5

TYGART RIVER AT DAMSITE

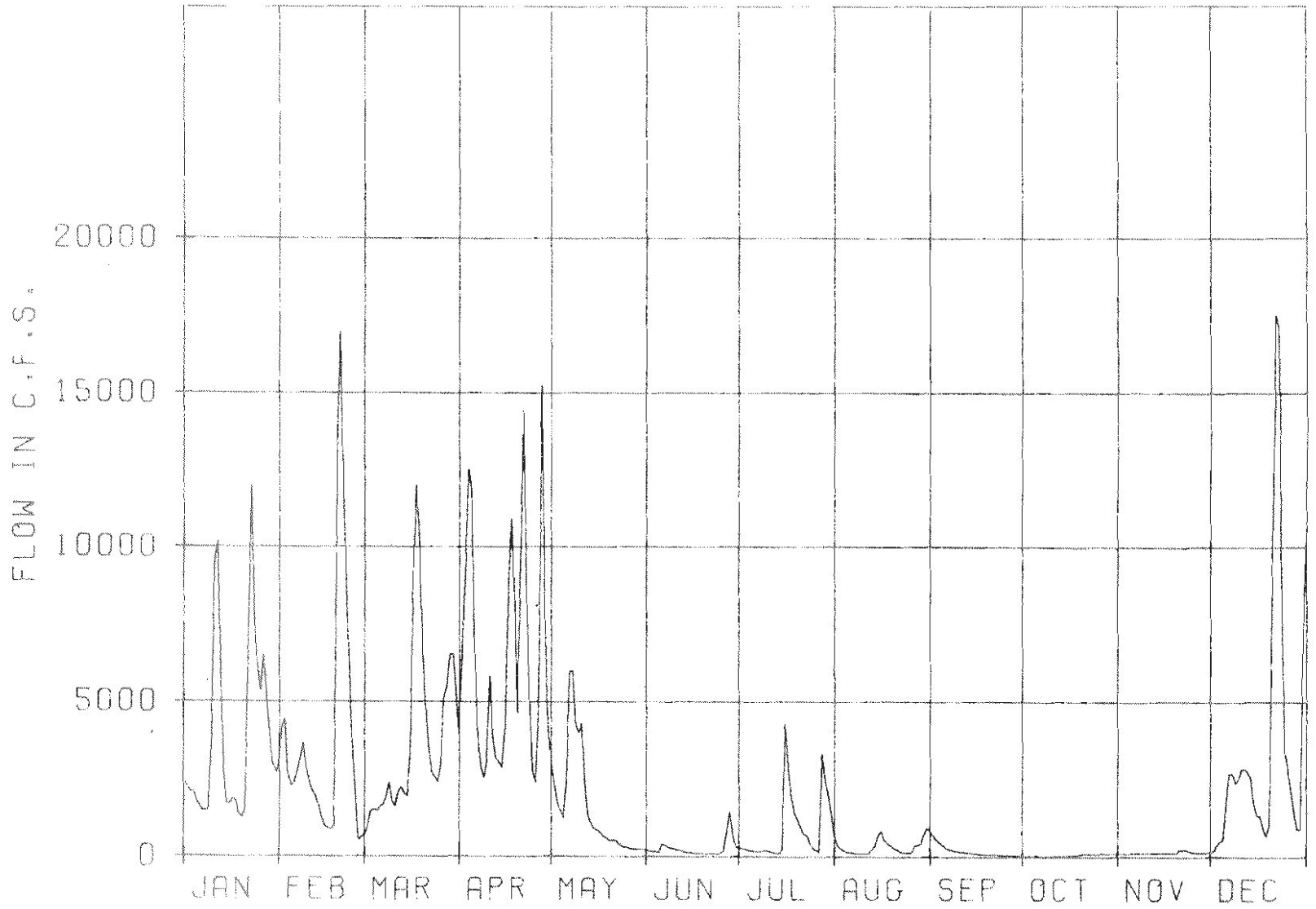


YEAR 1913

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-6

TYGART RIVER AT DAMSITE

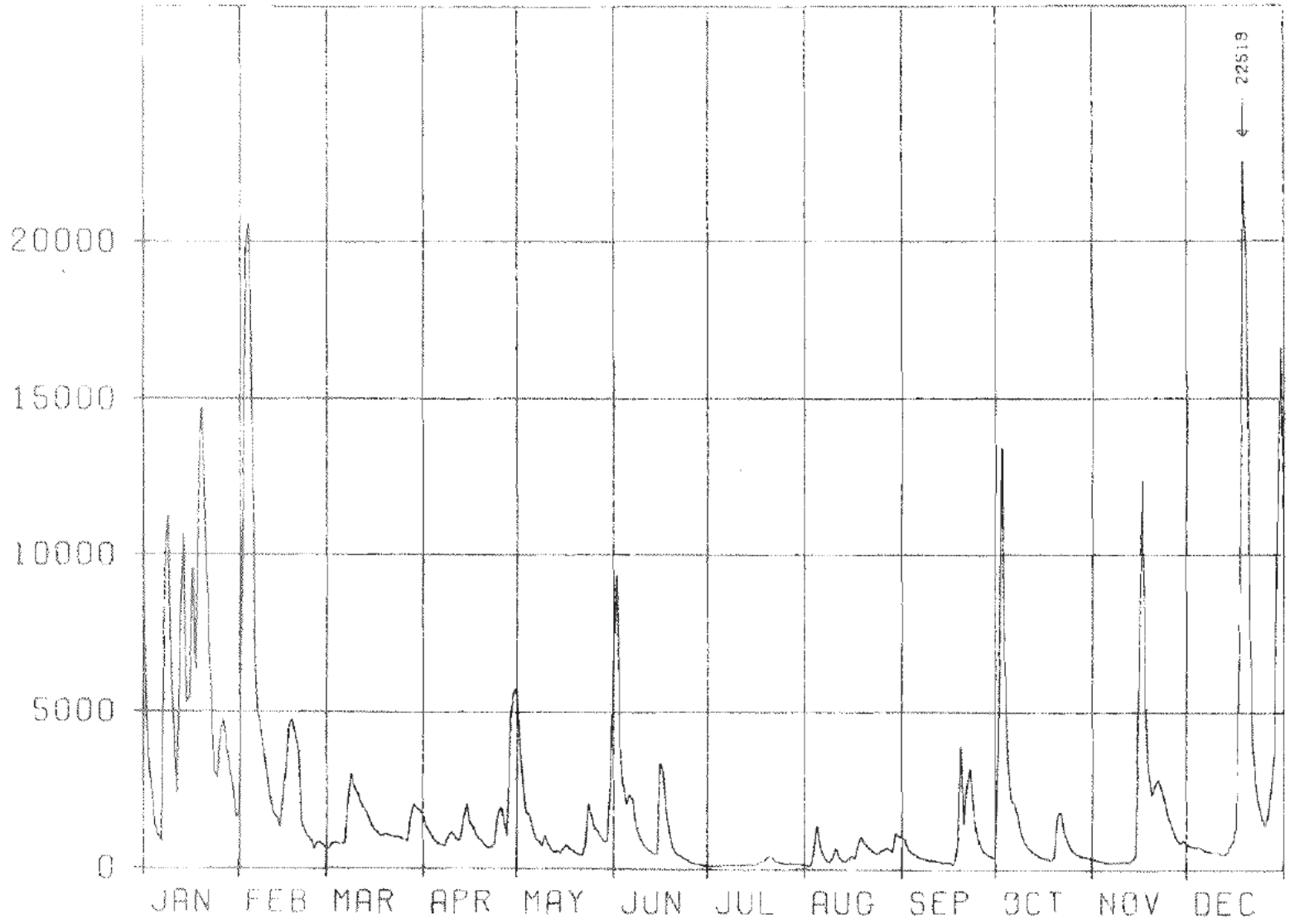


YEAR 1914

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-7

TYGART RIVER AT DAMSITE

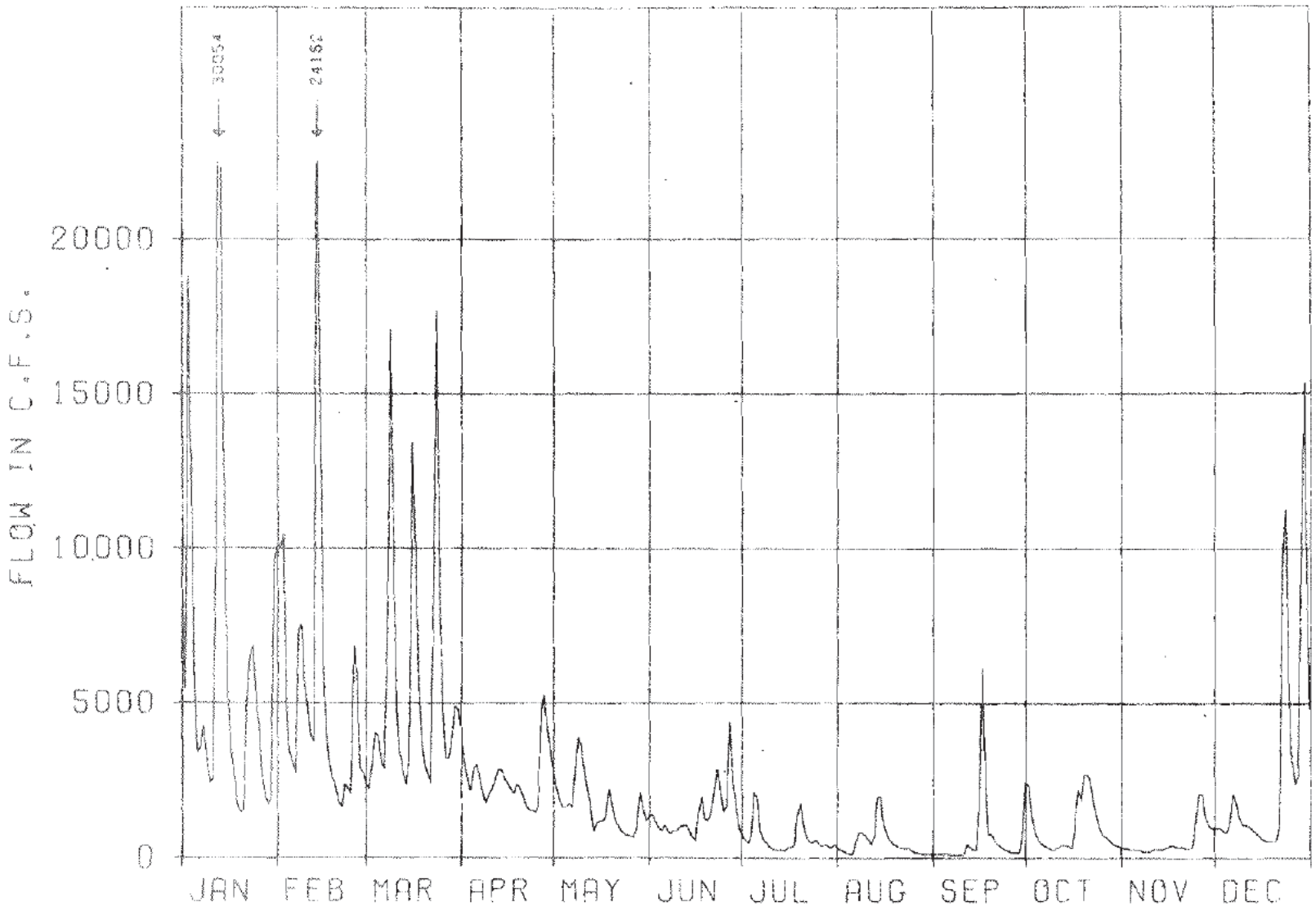


YEAR 1915

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-8

TYGART RIVER AT DAMSITE

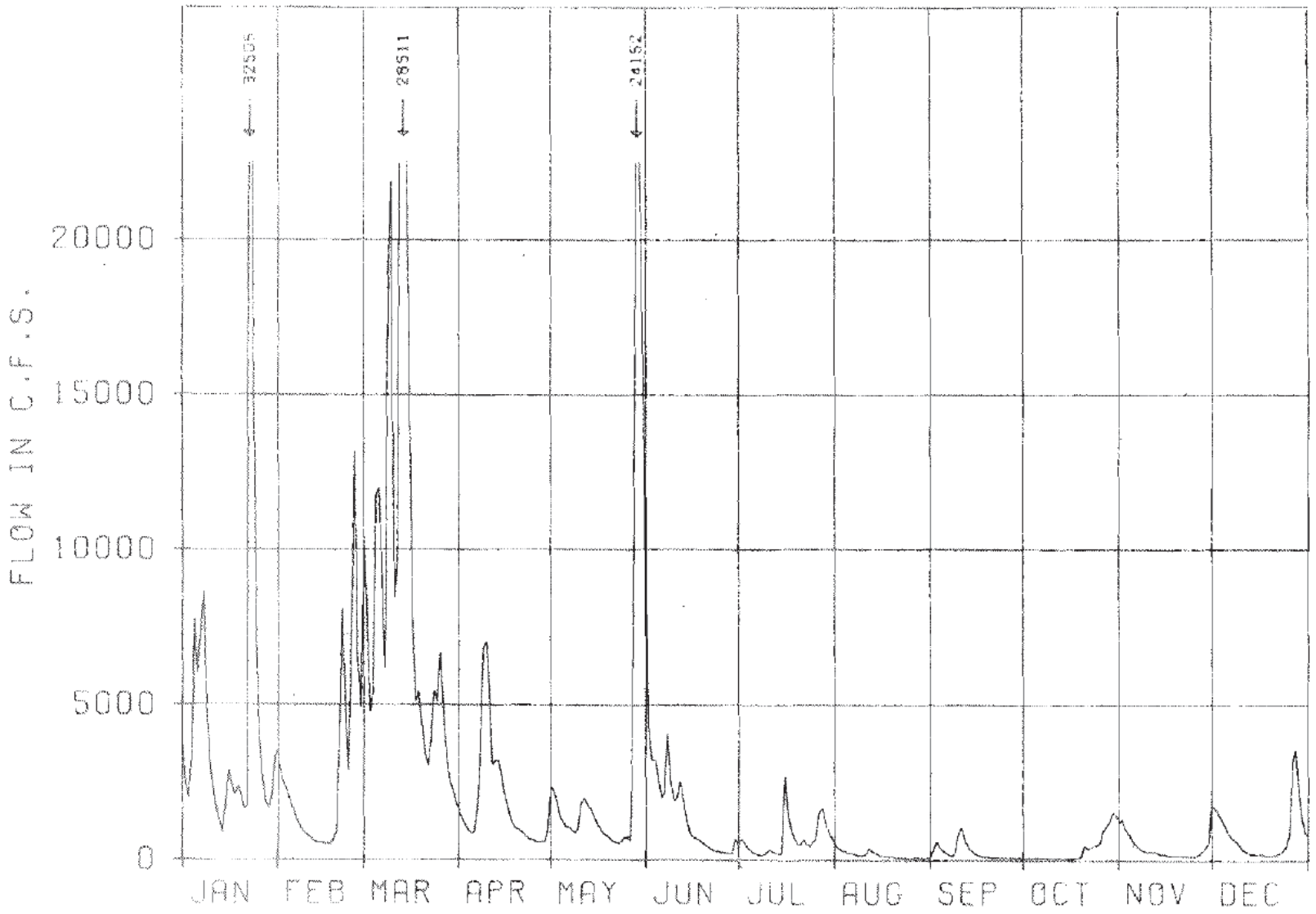


YEAR 1916

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-4

TYGART RIVER AT DAMSITE

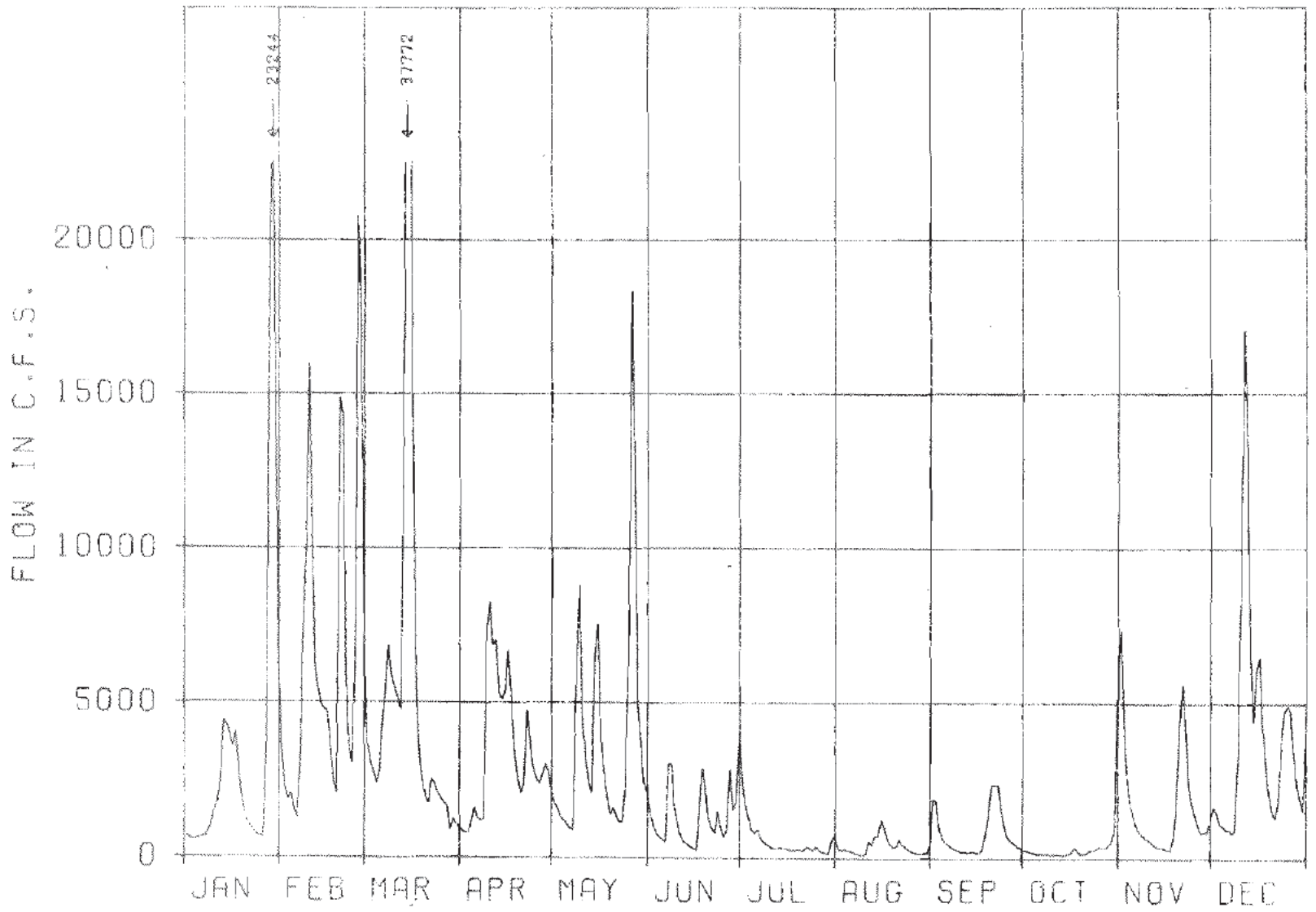


YEAR 1917

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-10

TYGART RIVER AT DAMSITE

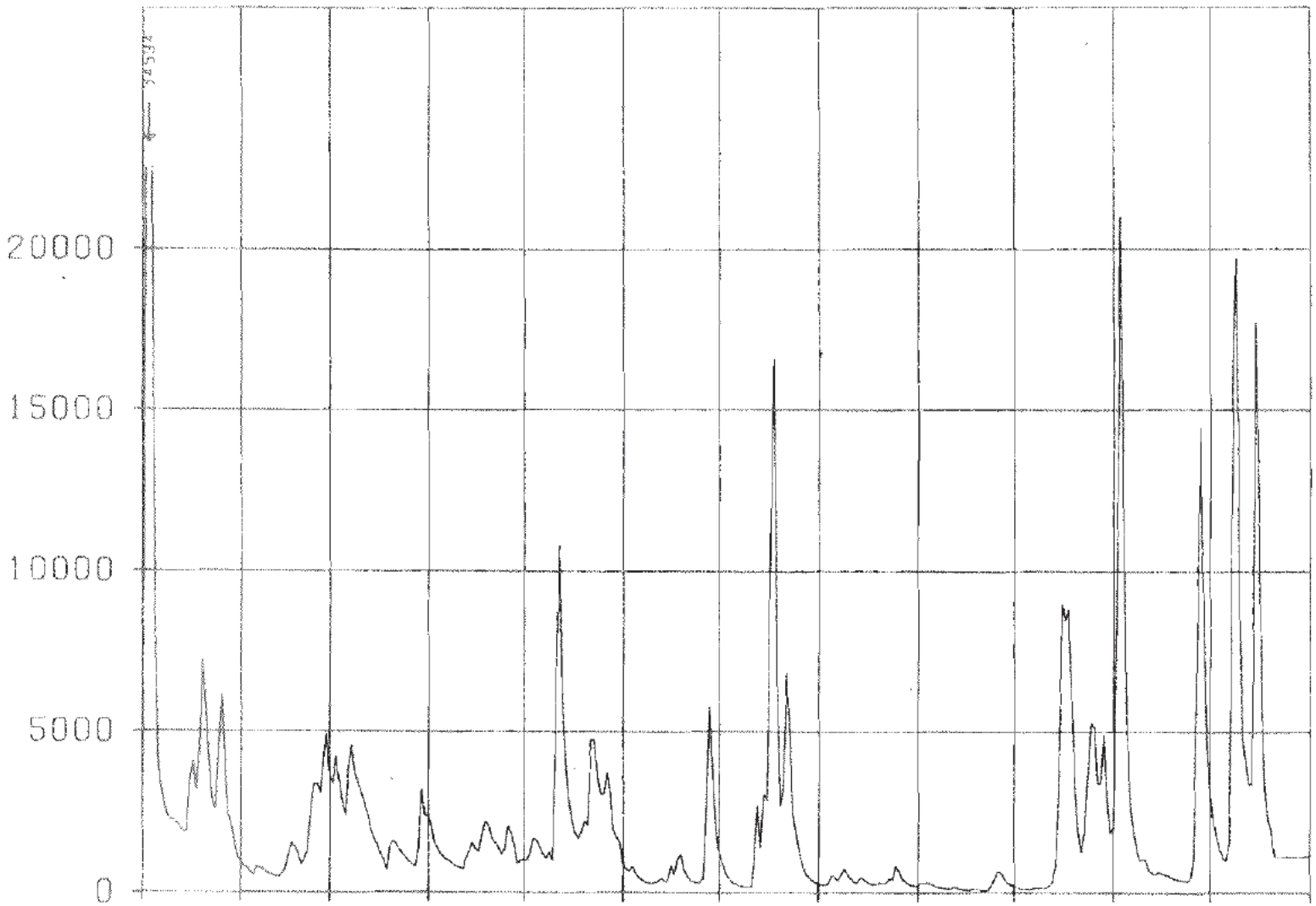


YEAR 1918

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-11

TYGART RIVER AT DAMSITE

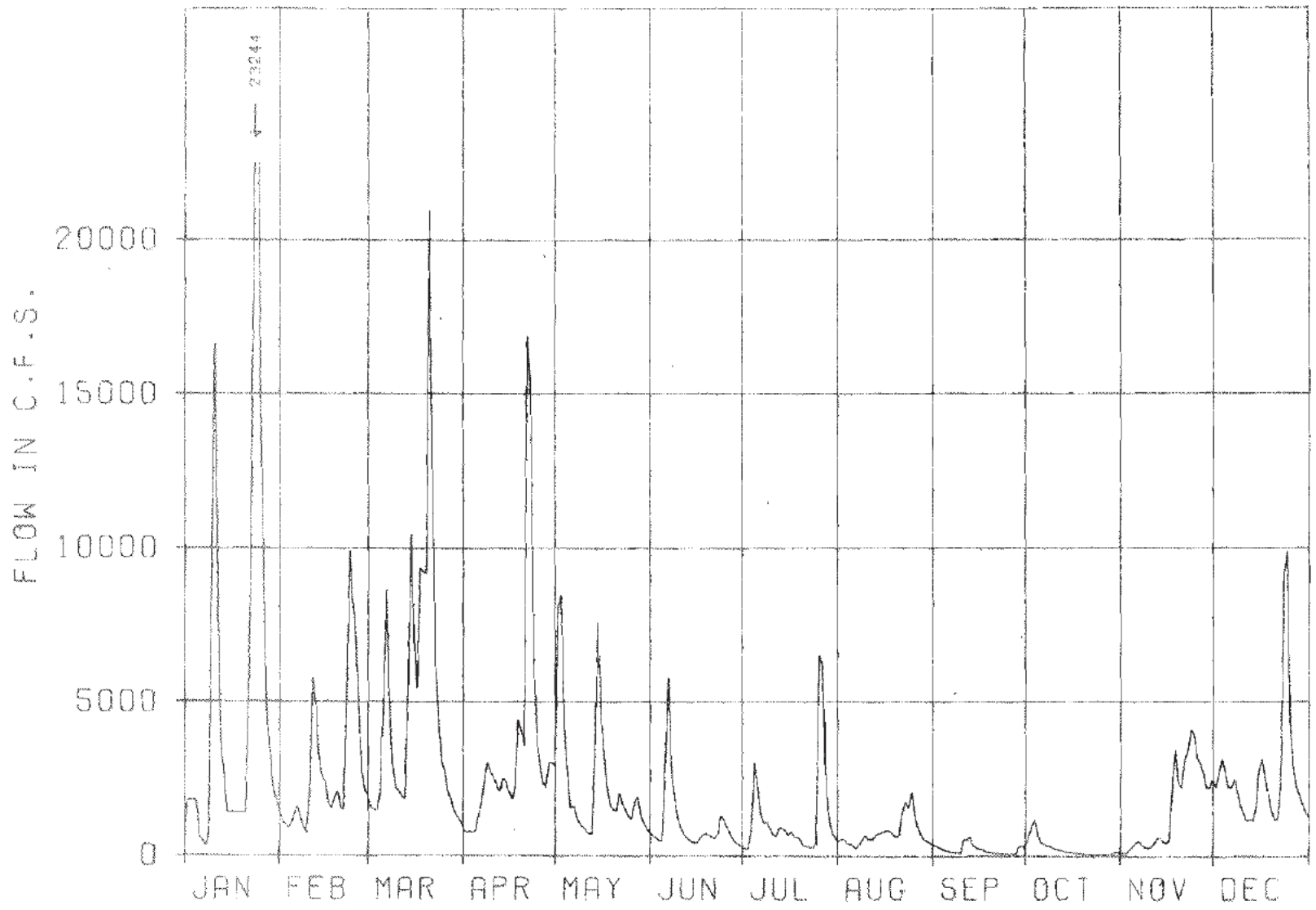


YEAR 1919

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-12

TYGART RIVER AT DAMSITE

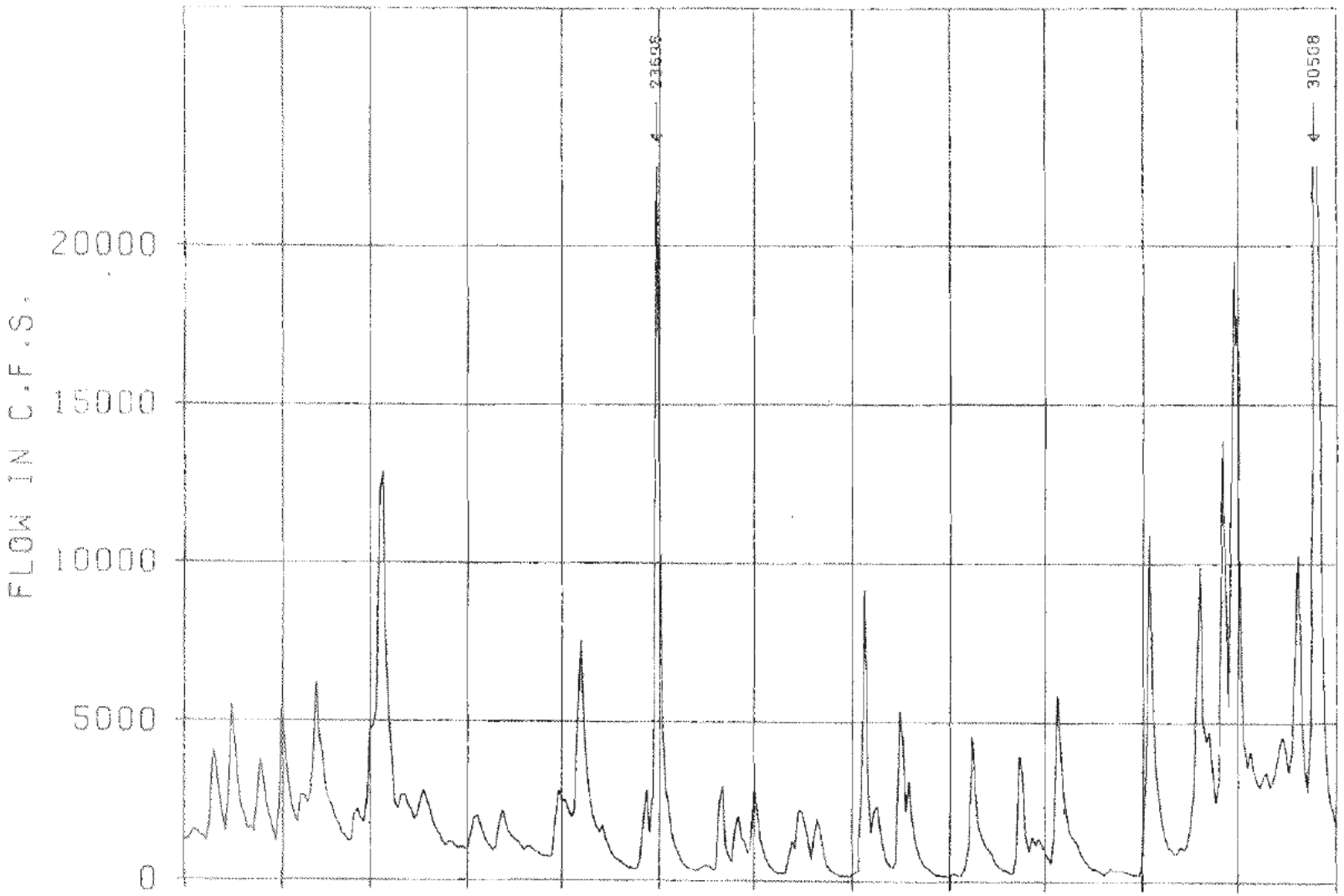


YEAR 1920

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-13

TYGART RIVER AT DAMSITE



YEAR 1921

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-14

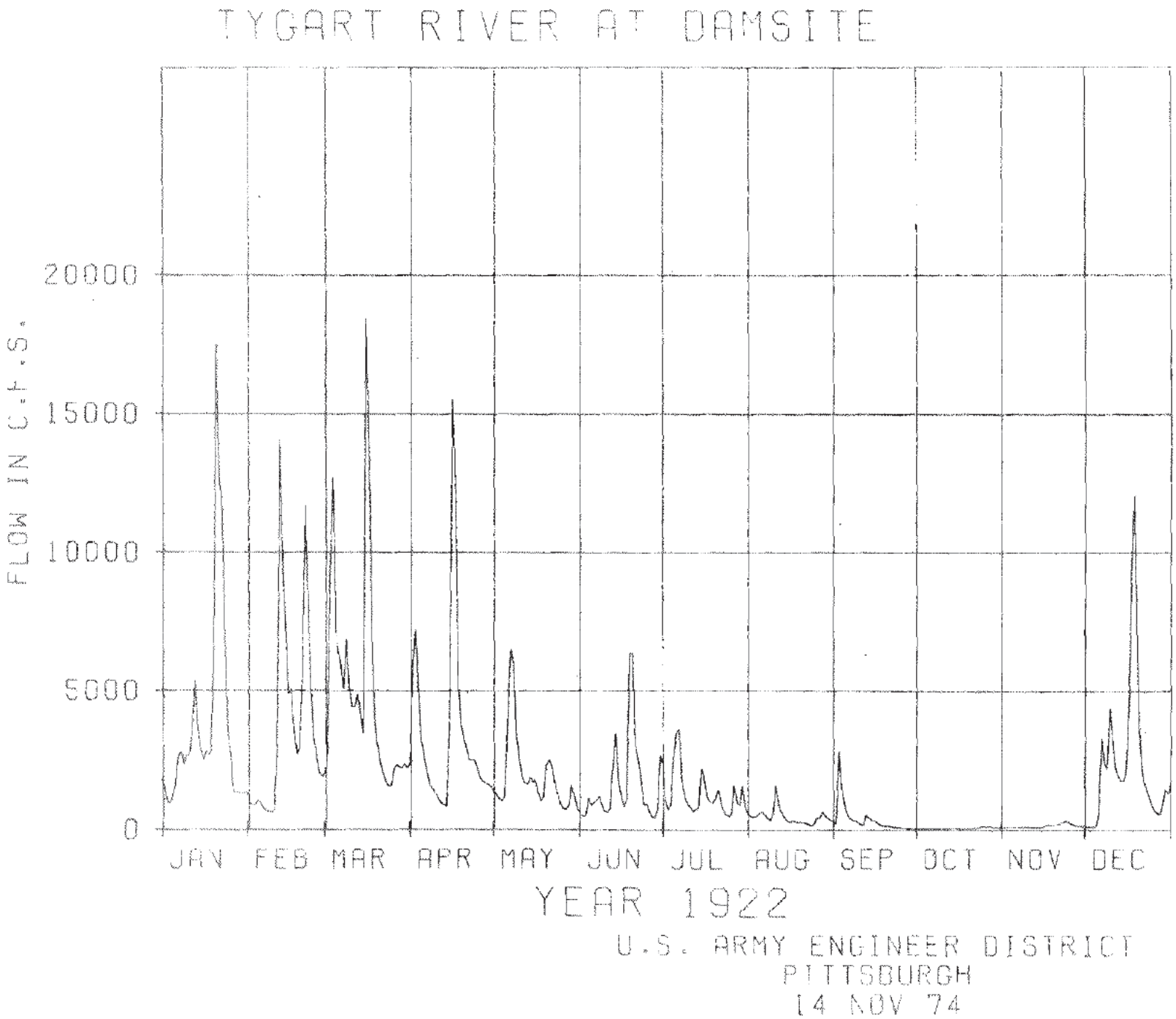
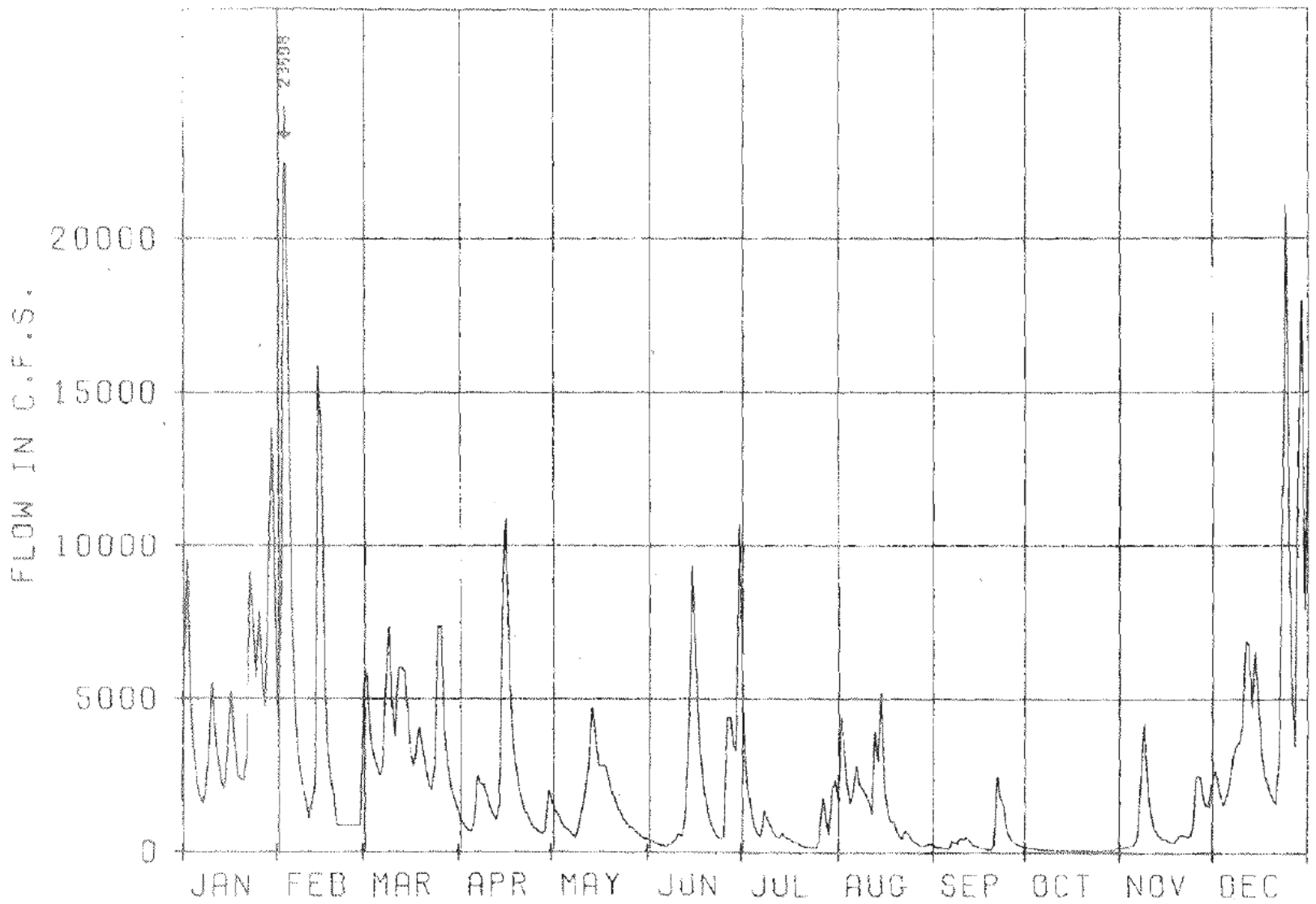

TYGART RIVER AT DAMSITE
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1922
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-15

TYGART RIVER AT DAMSITE

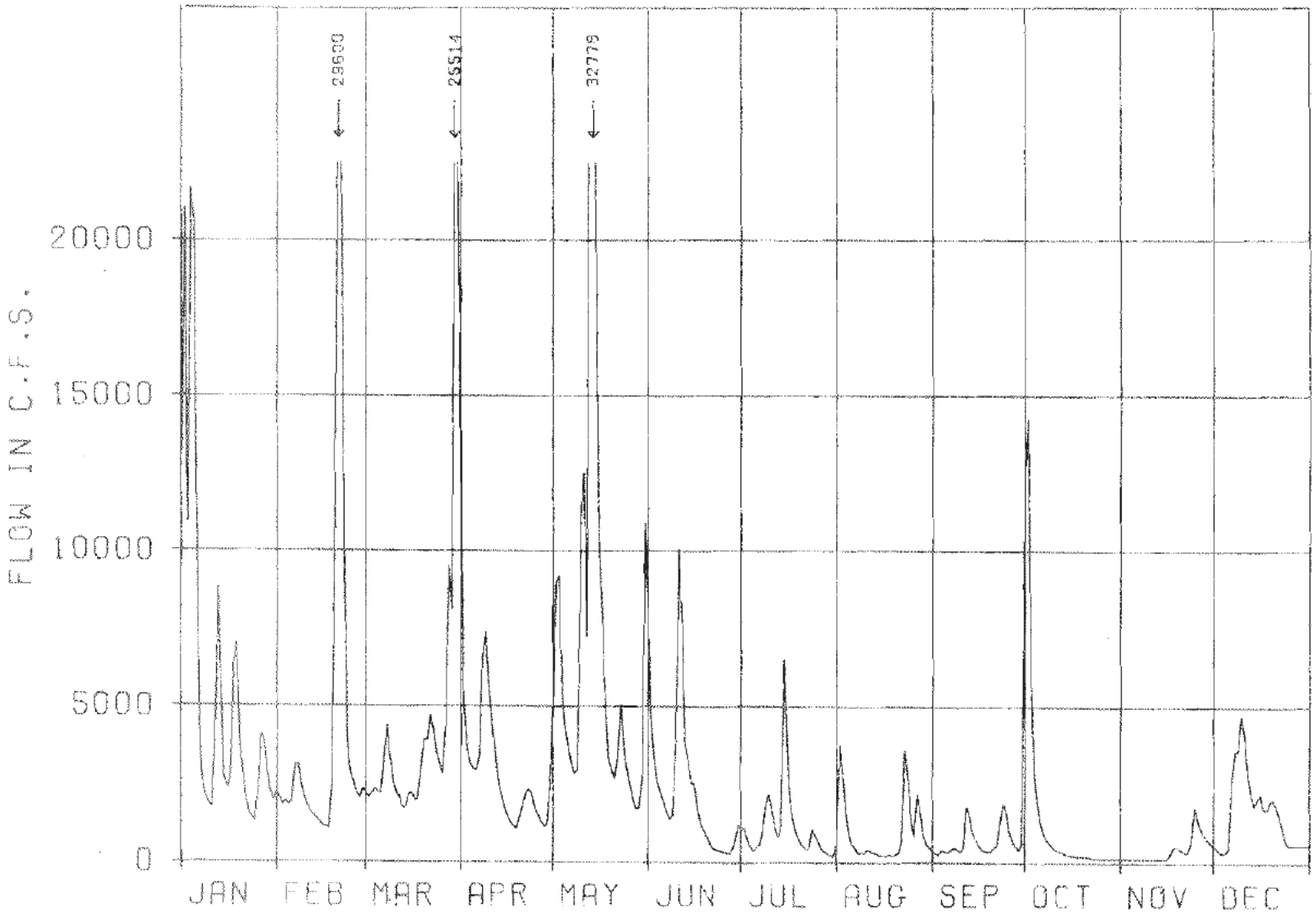


YEAR 1923

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-16

TYGART RIVER AT DAMSITE



YEAR 1924

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-17

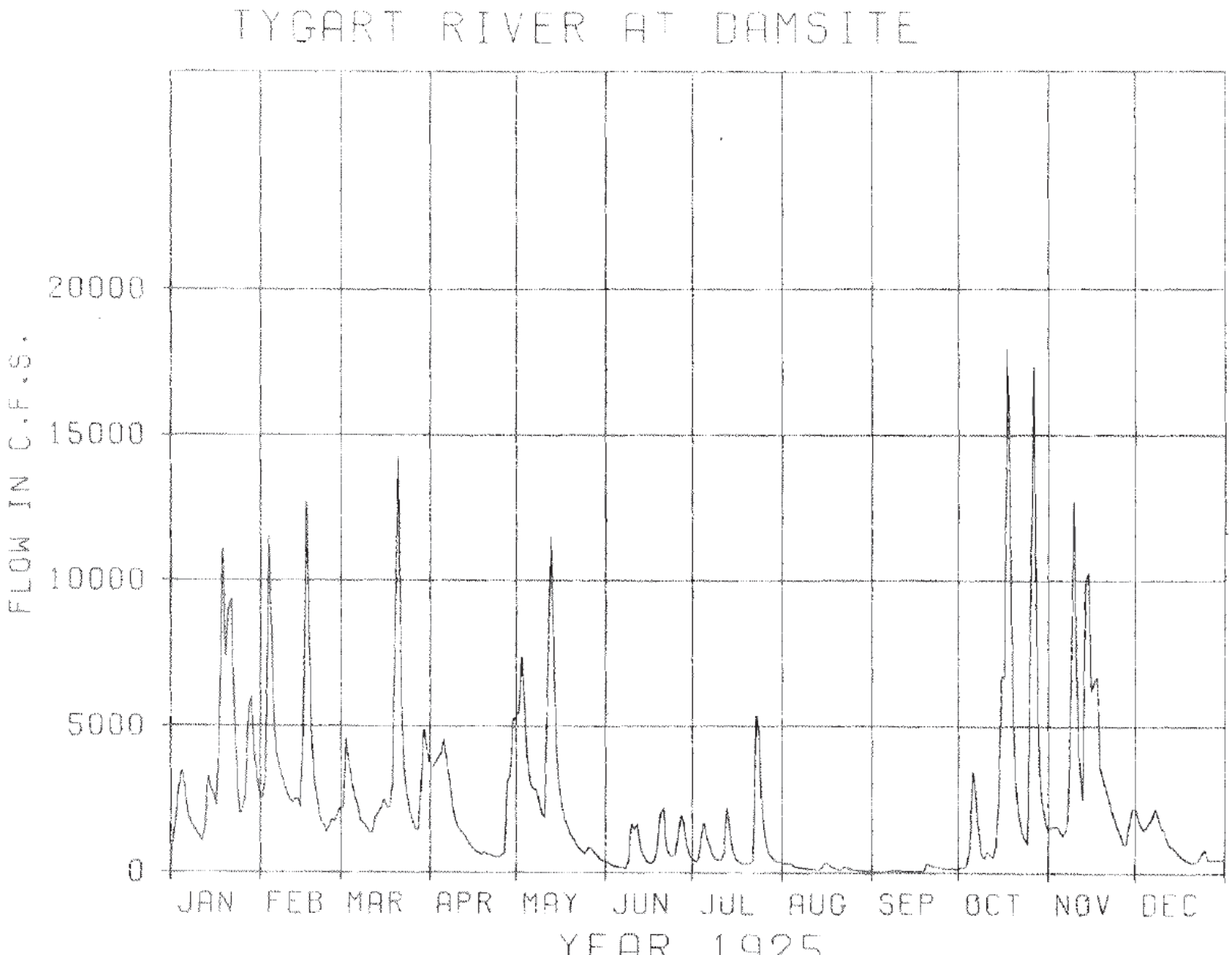

TYGART RIVER AT DAMSITE
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1925
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-18

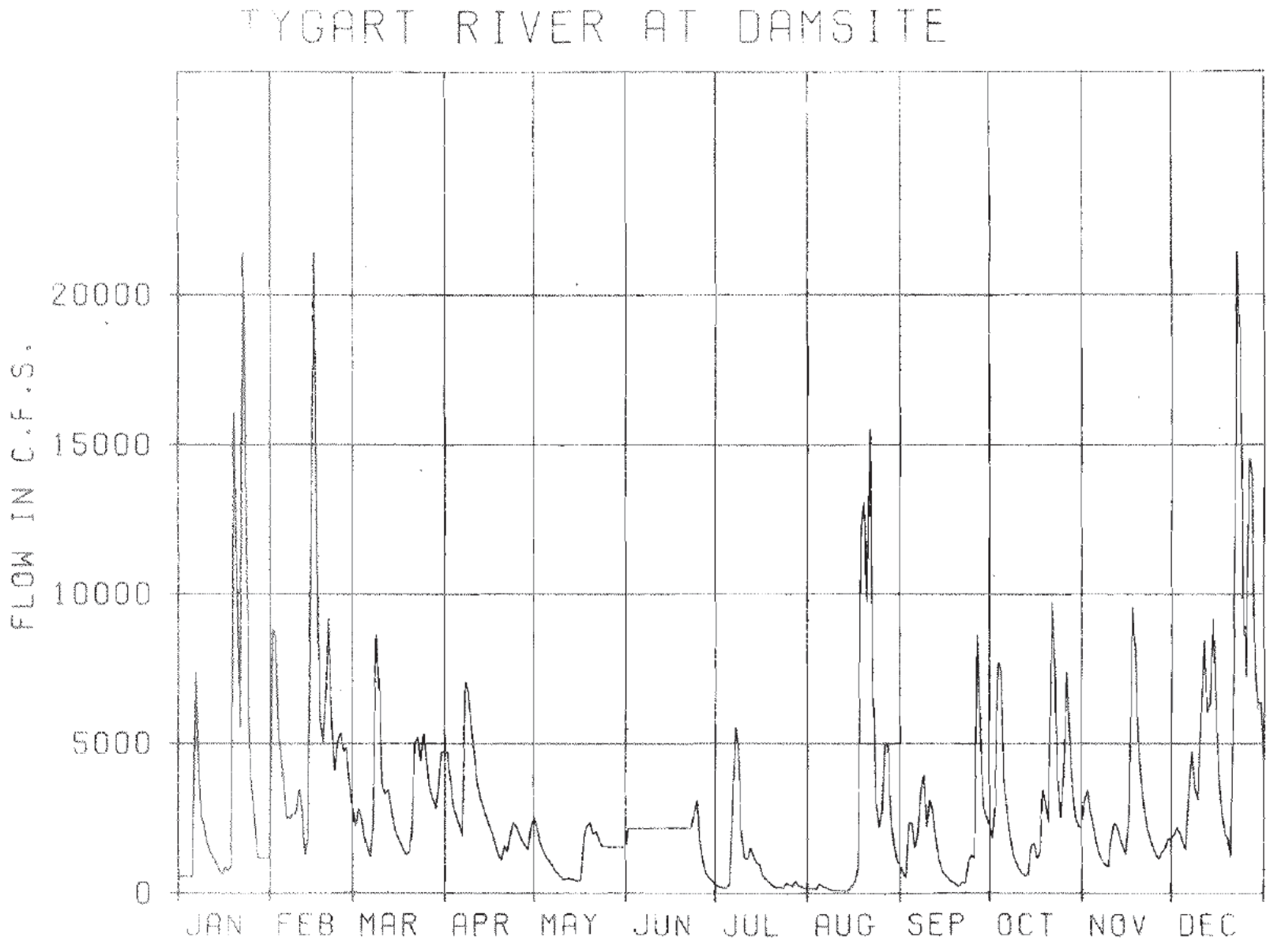
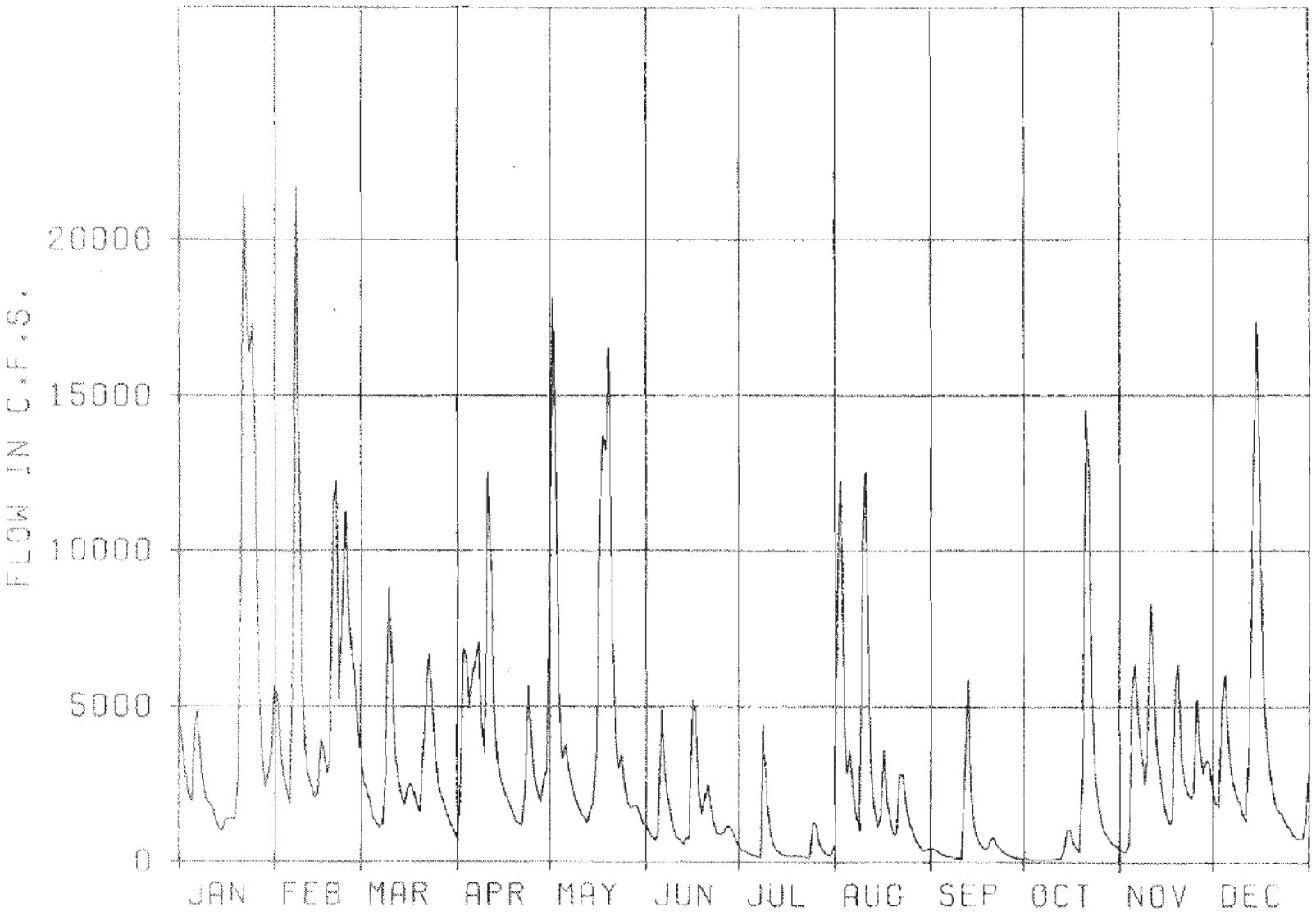

TYGART RIVER AT DAMSITE
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1926
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-19

TYGART RIVER AT DAMSITE

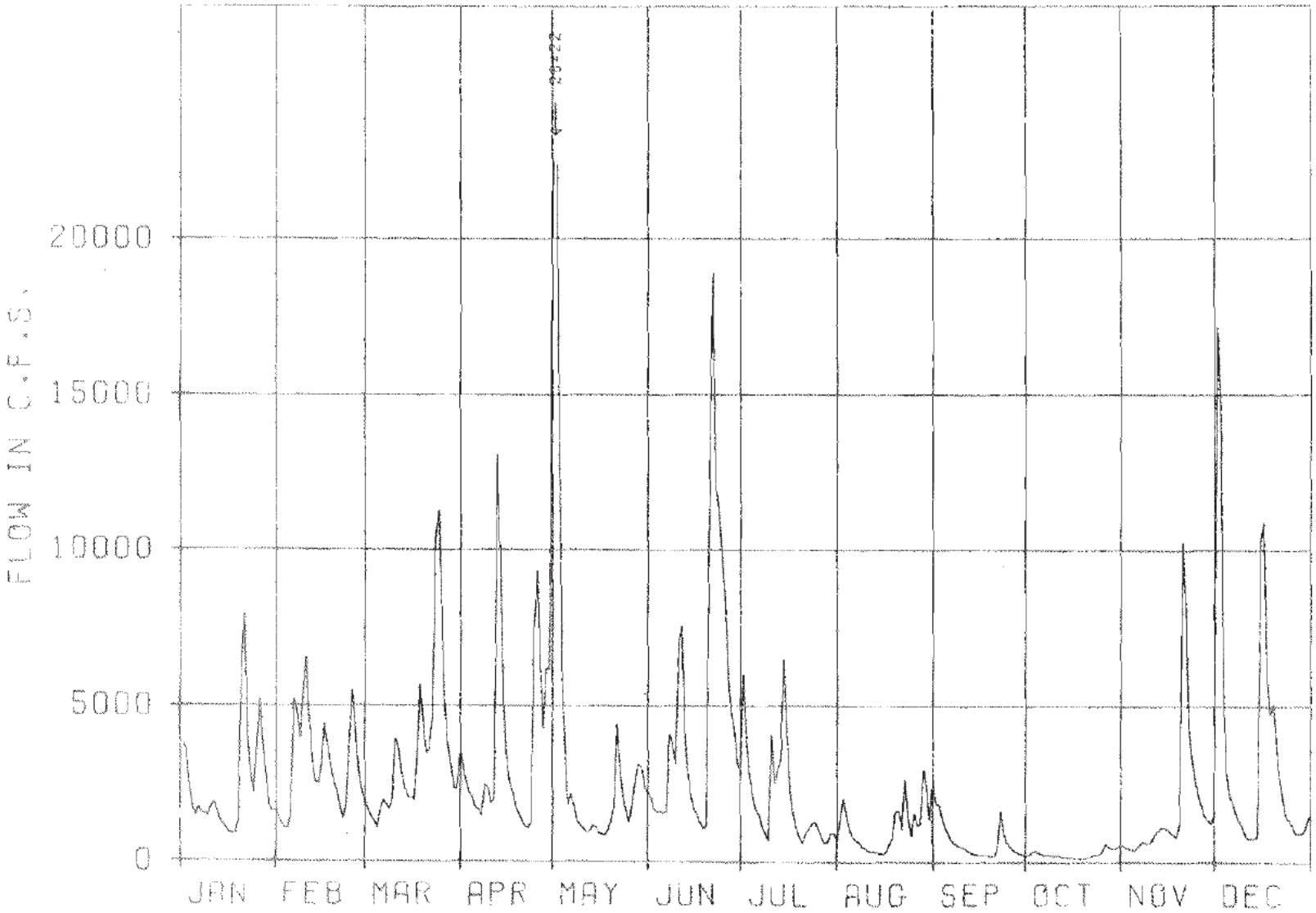


YEAR 1927

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-20

TYGART RIVER AT DAMSITE

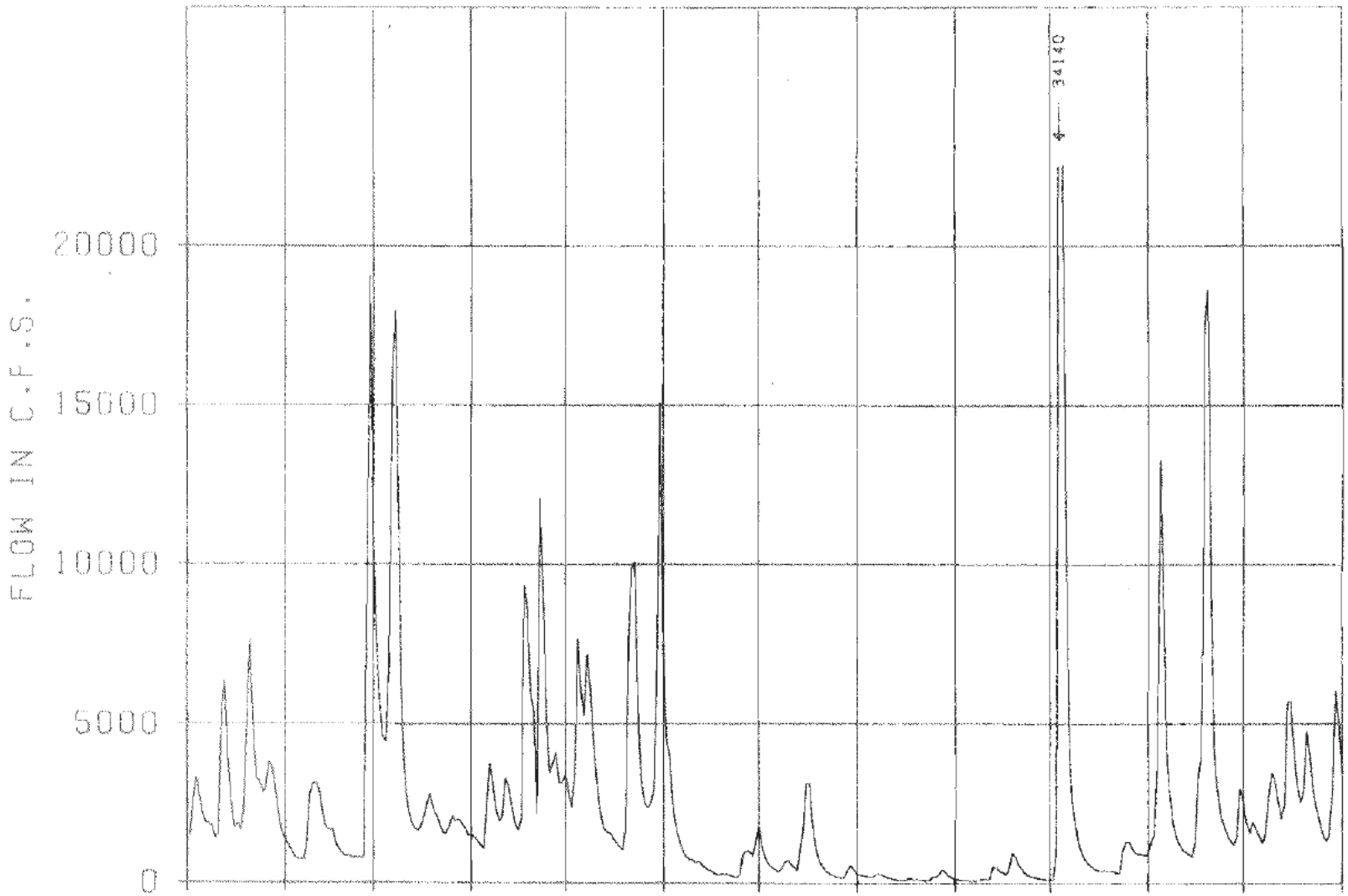


YEAR 1928

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-21

TYGART RIVER AT DAMSITE

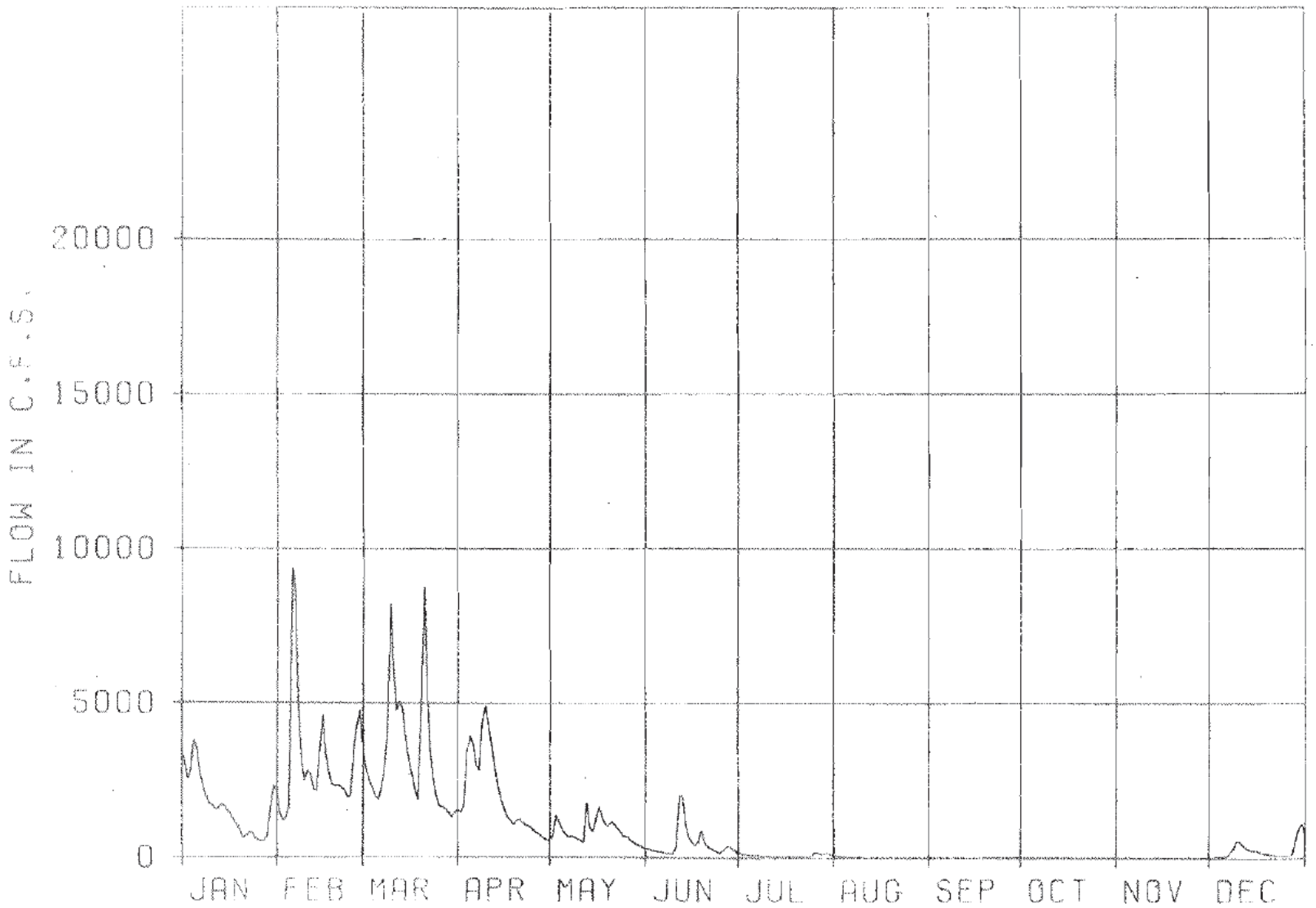


YEAR 1929

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 29-22

TYGART RIVER AT DAMSITE

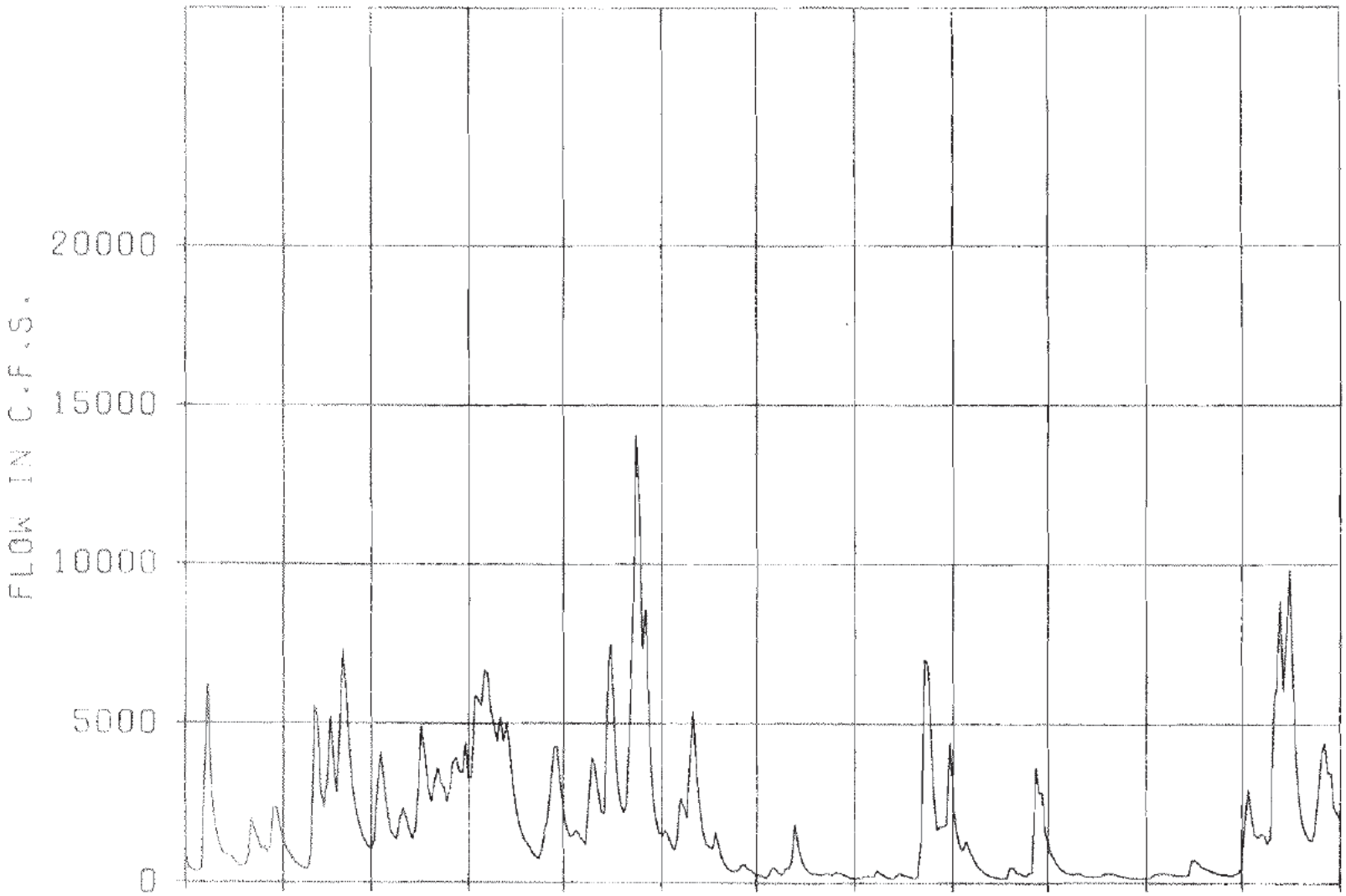


YEAR 1930

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-23

TYGART RIVER AT DAMSITE



YEAR 1931

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-24

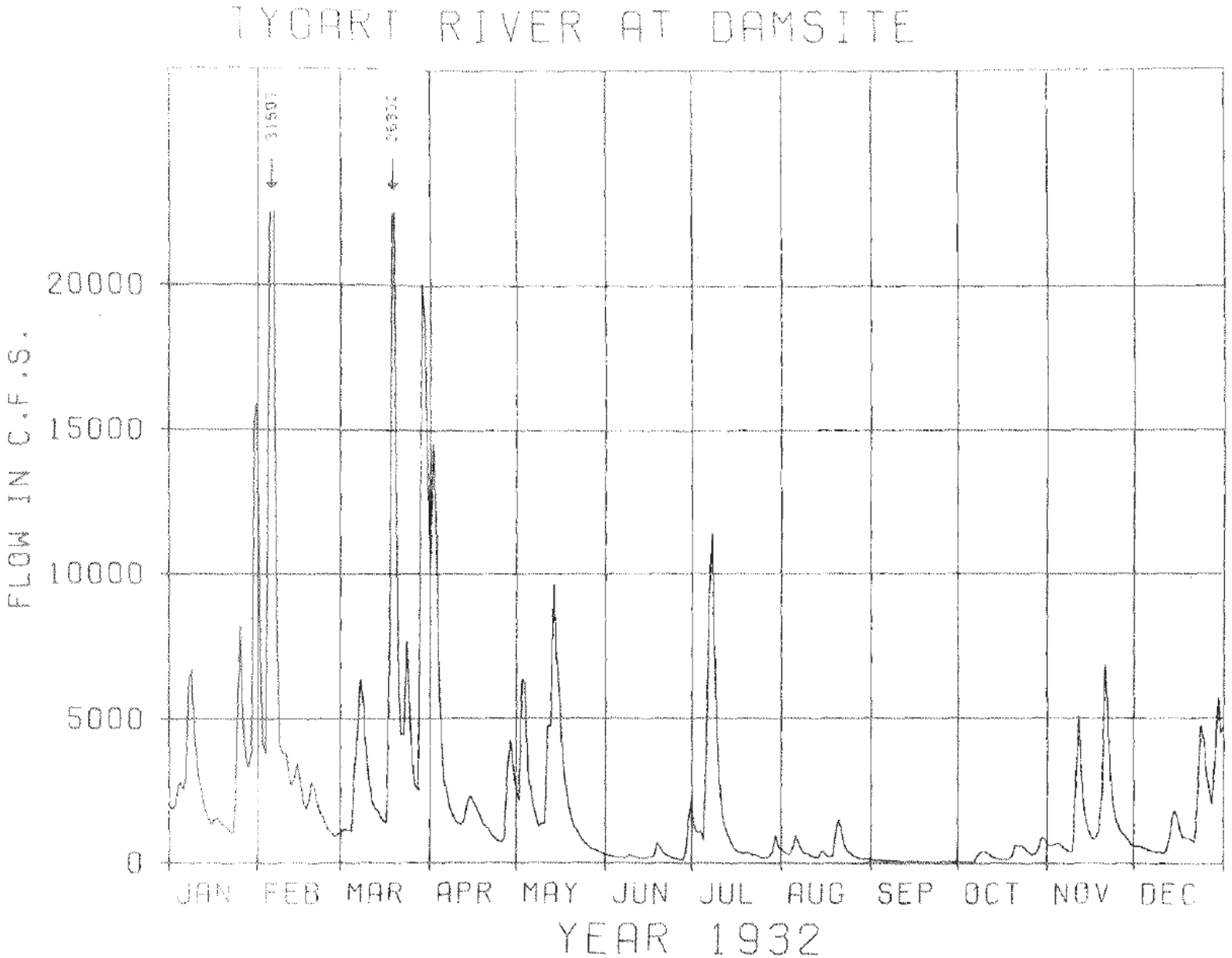

TYGART RIVER AT DAMSITE
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
YEAR 1932
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-25

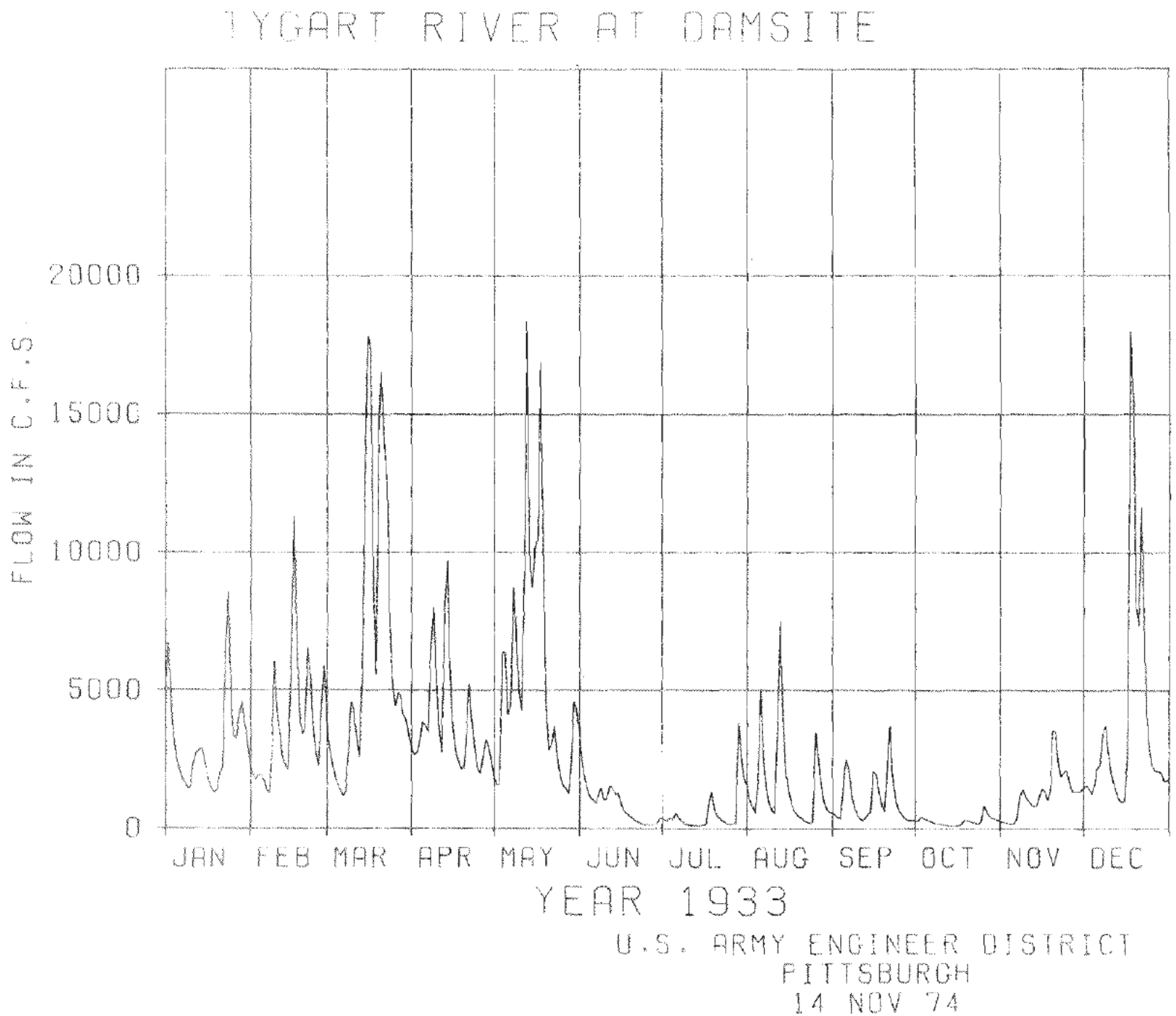
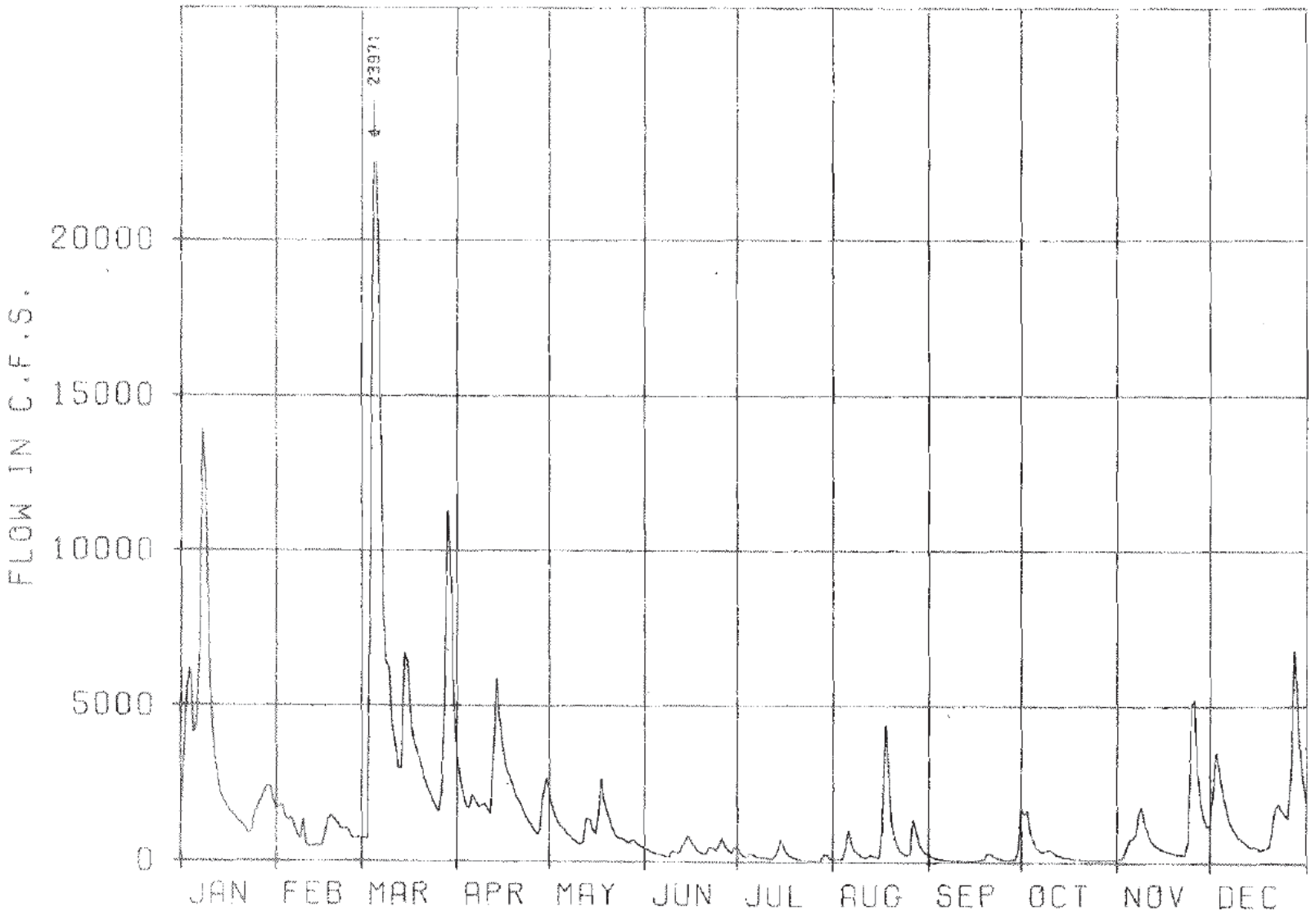

TYGART RIVER AT DAMSITE
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1933
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-26

TYGART RIVER AT DAMSITE



YEAR 1934

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-27

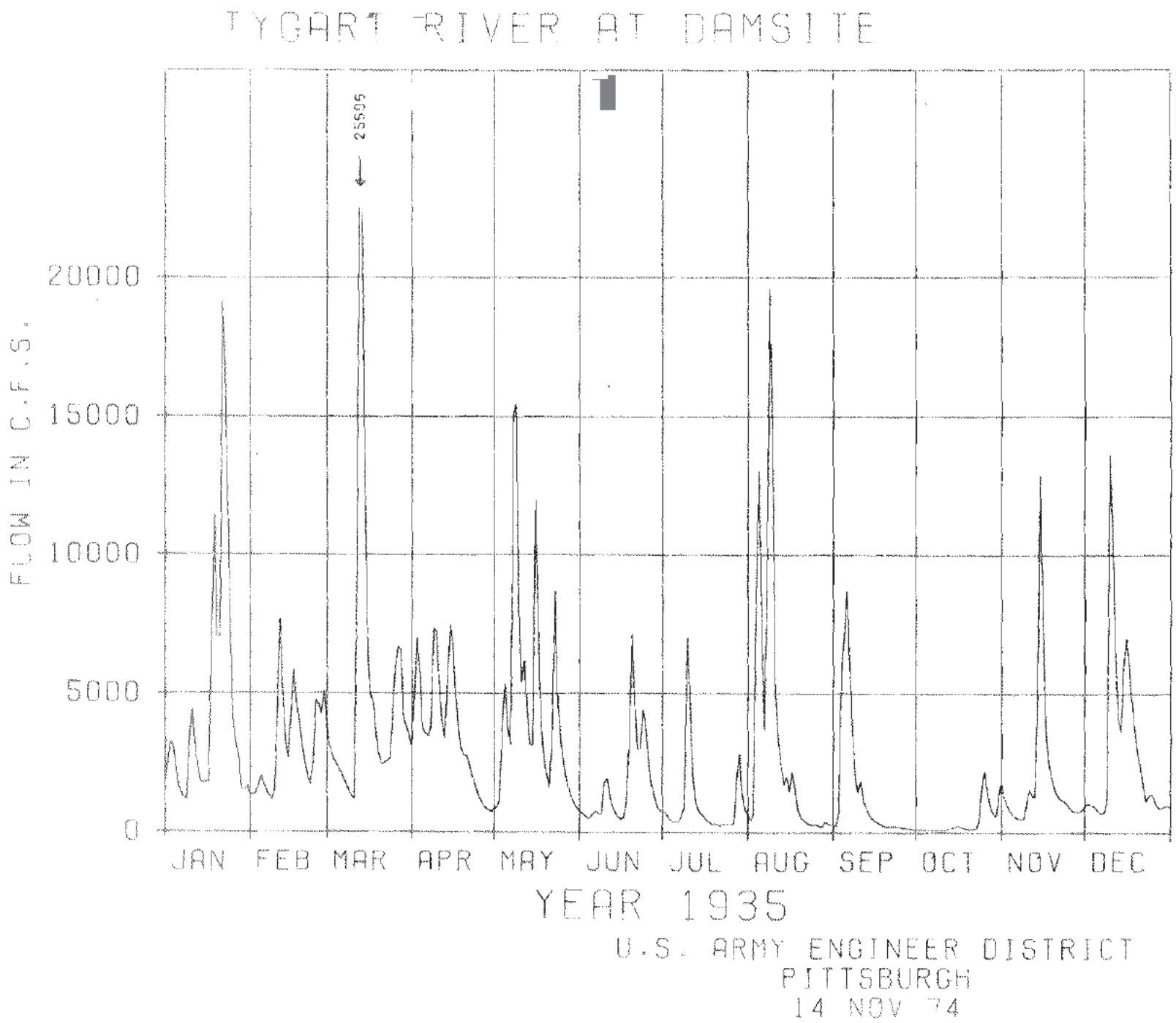
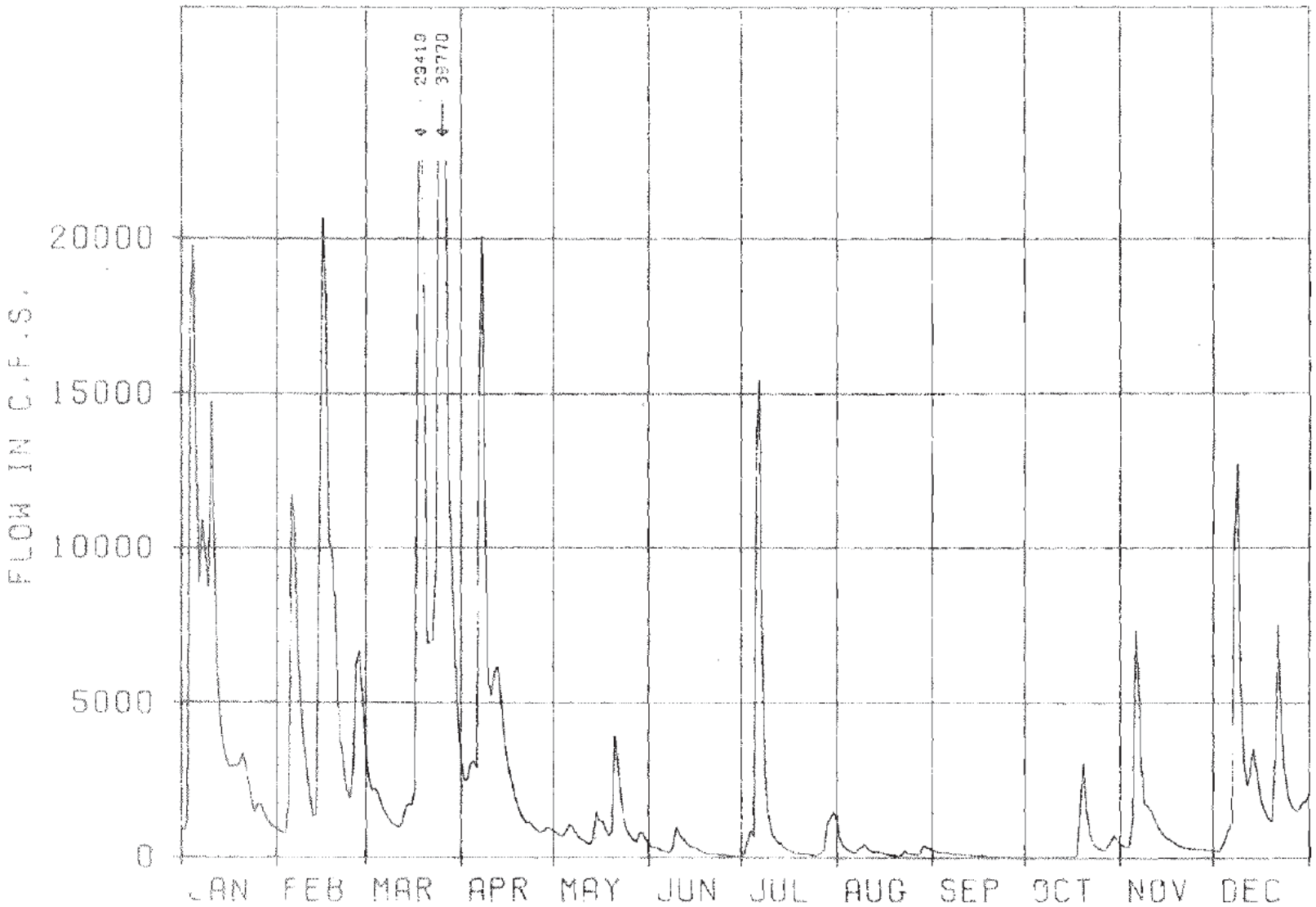

TYGART RIVER AT DAMSITE
25505
20000
15000
10000
5000
0
FLOW IN C.F.S.
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1935
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-28

TYGART RIVER AT DAMSITE

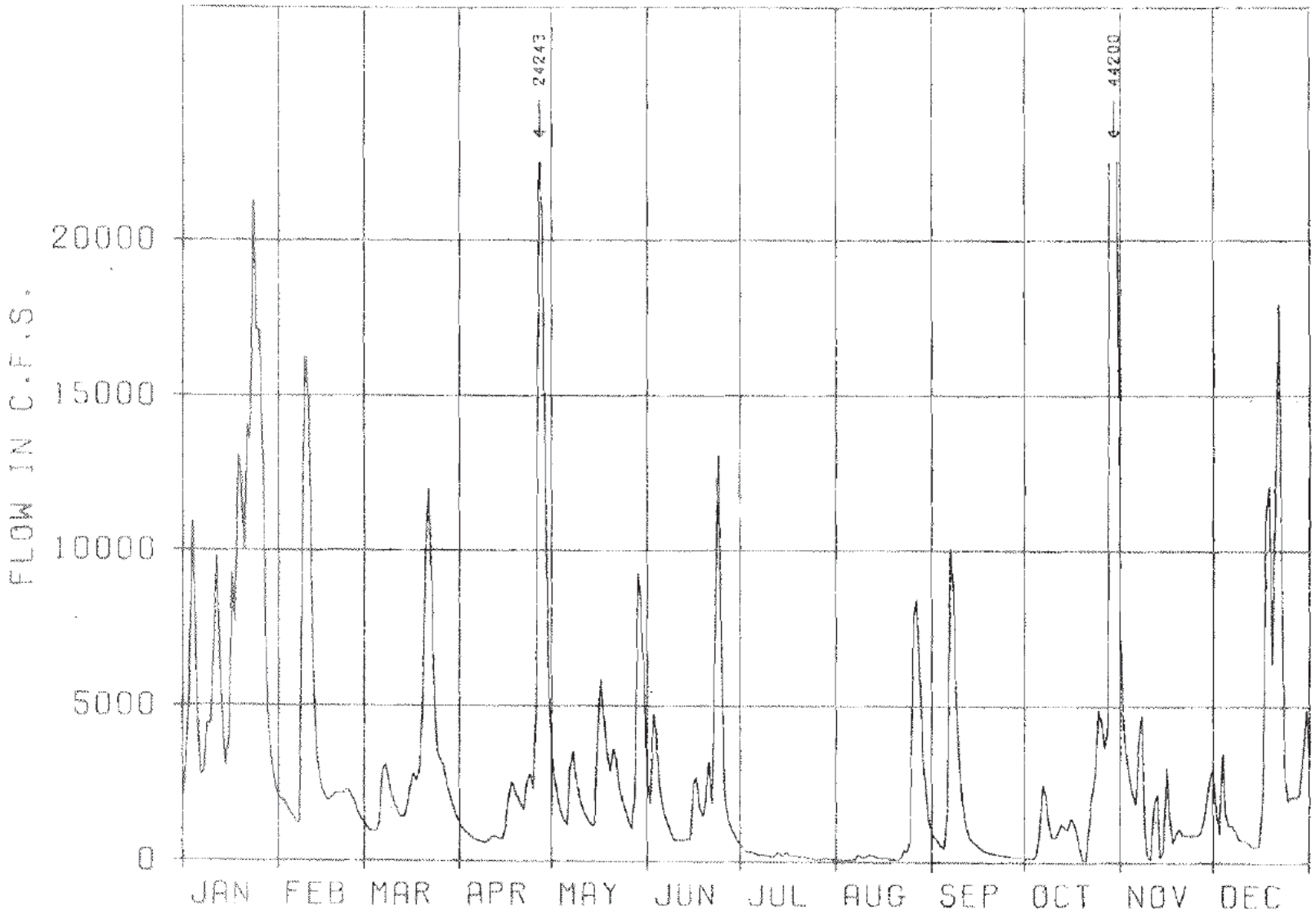


YEAR 1936

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-29

TYGART RIVER AT DAMSITE

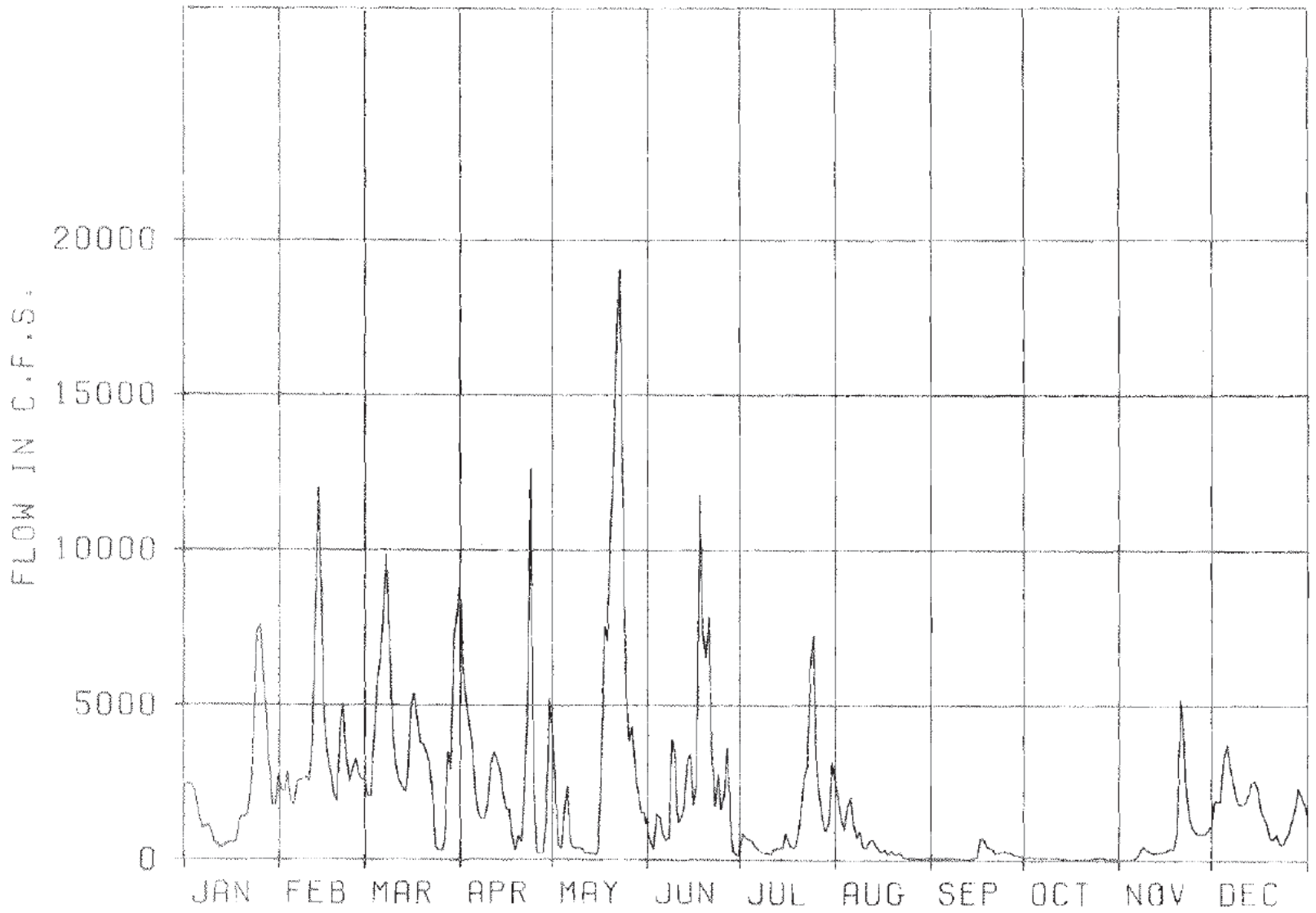


YEAR 1937

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-30

TYGART RIVER AT DAMSITE

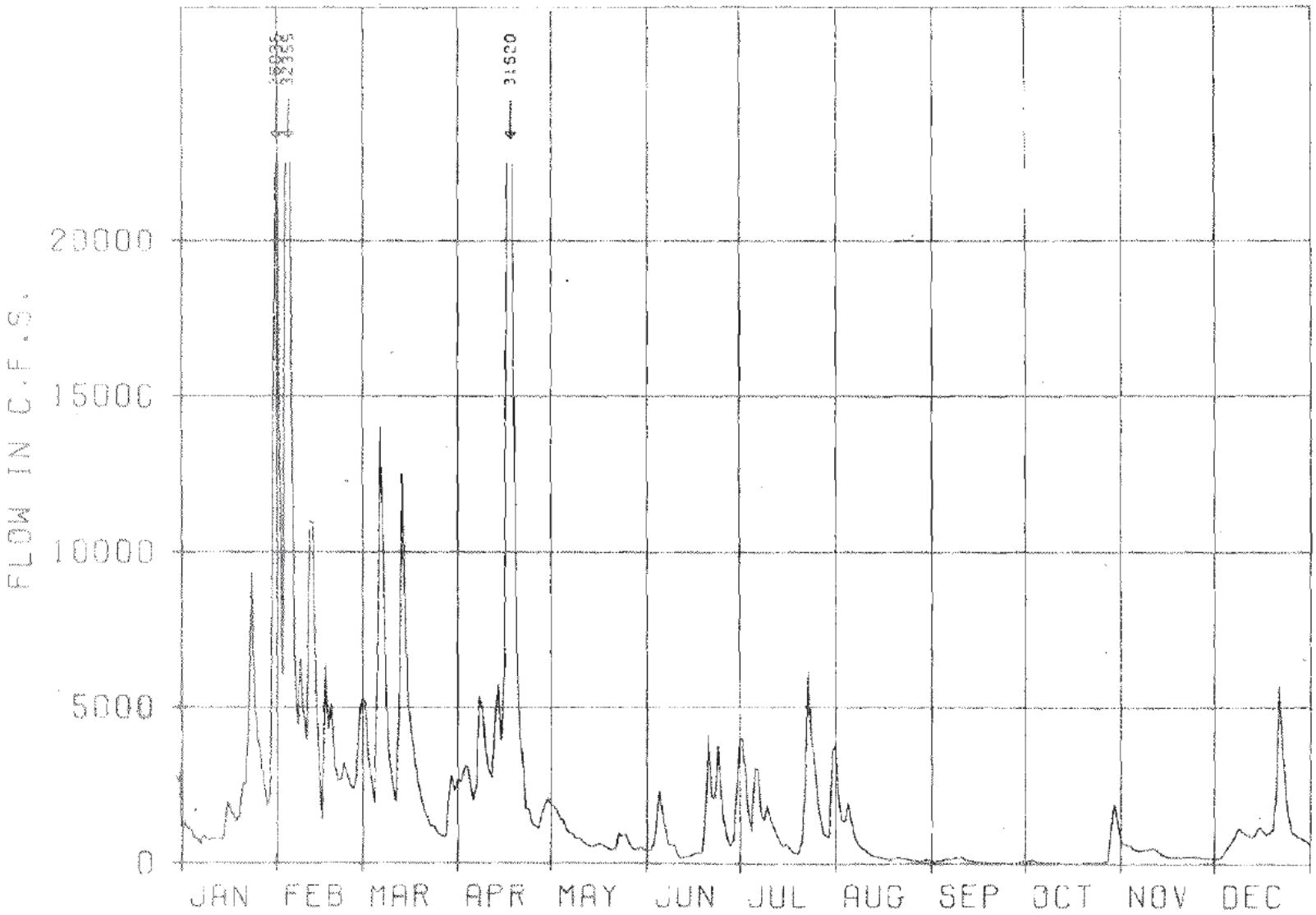


YEAR 1938

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-31

TYGART RIVER AT DAMSITE

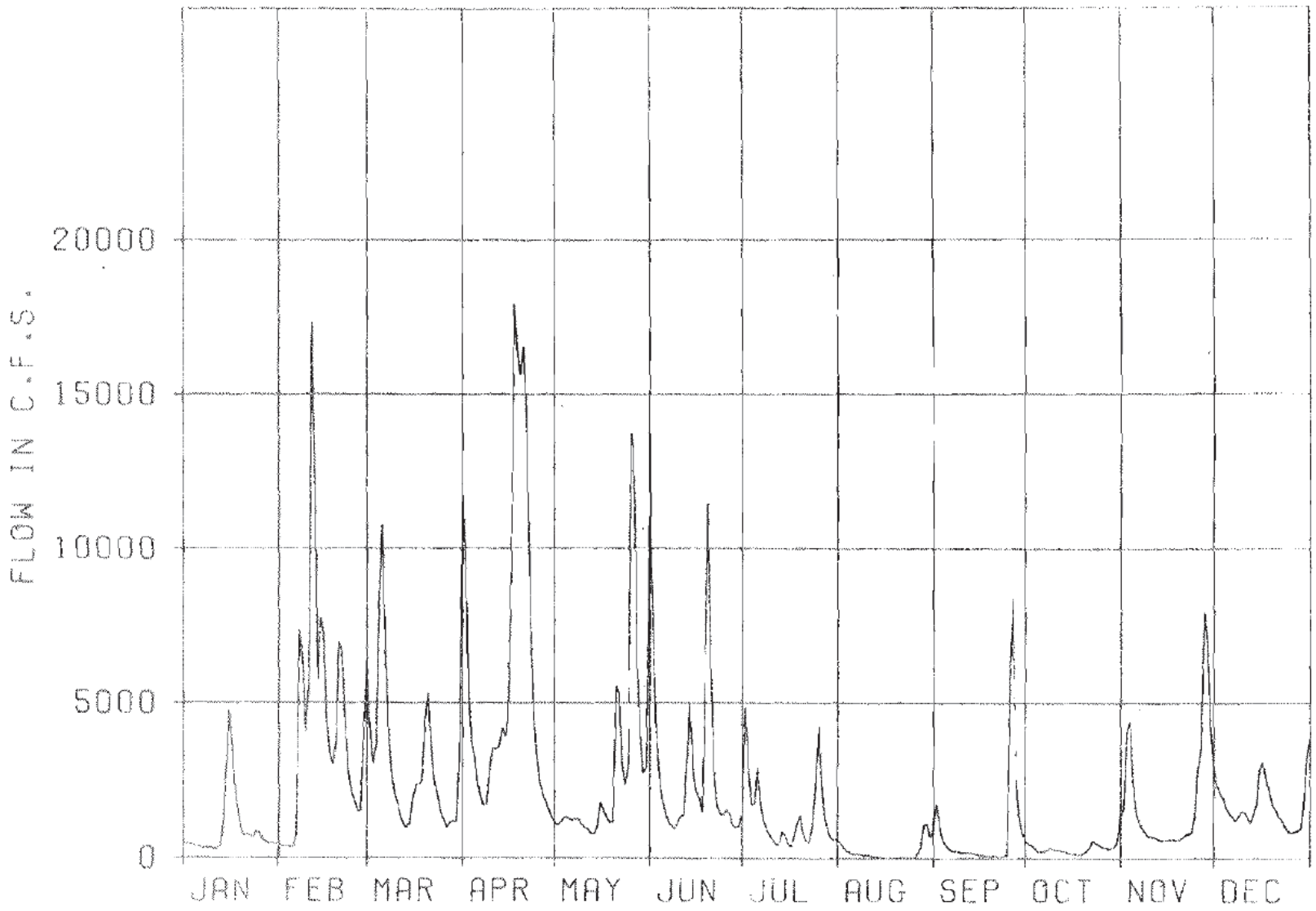


YEAR 1939

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-32

TYGART RIVER AT DAMSITE

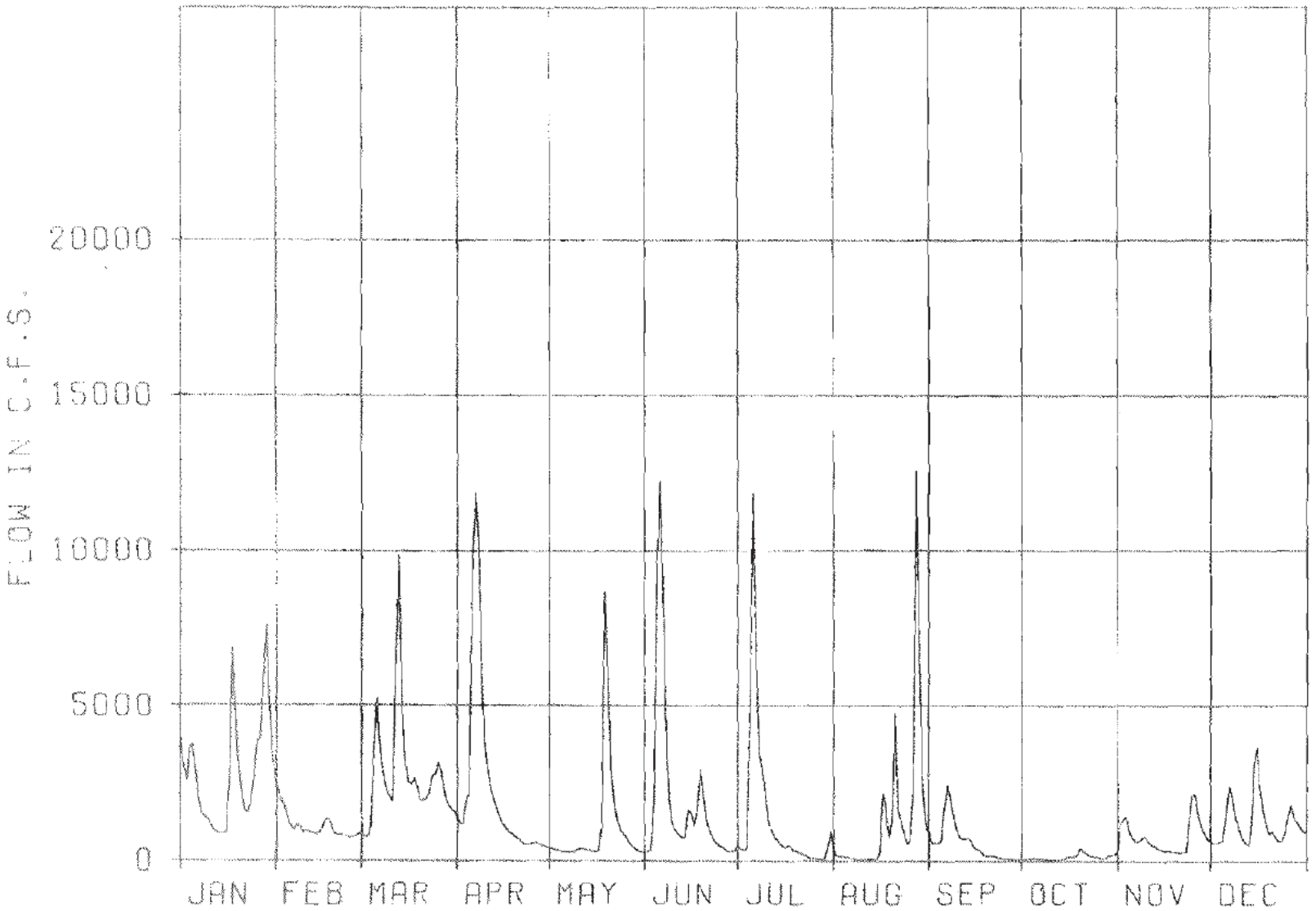


YEAR 1940

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-33

TYGART RIVER AT DAMSITE

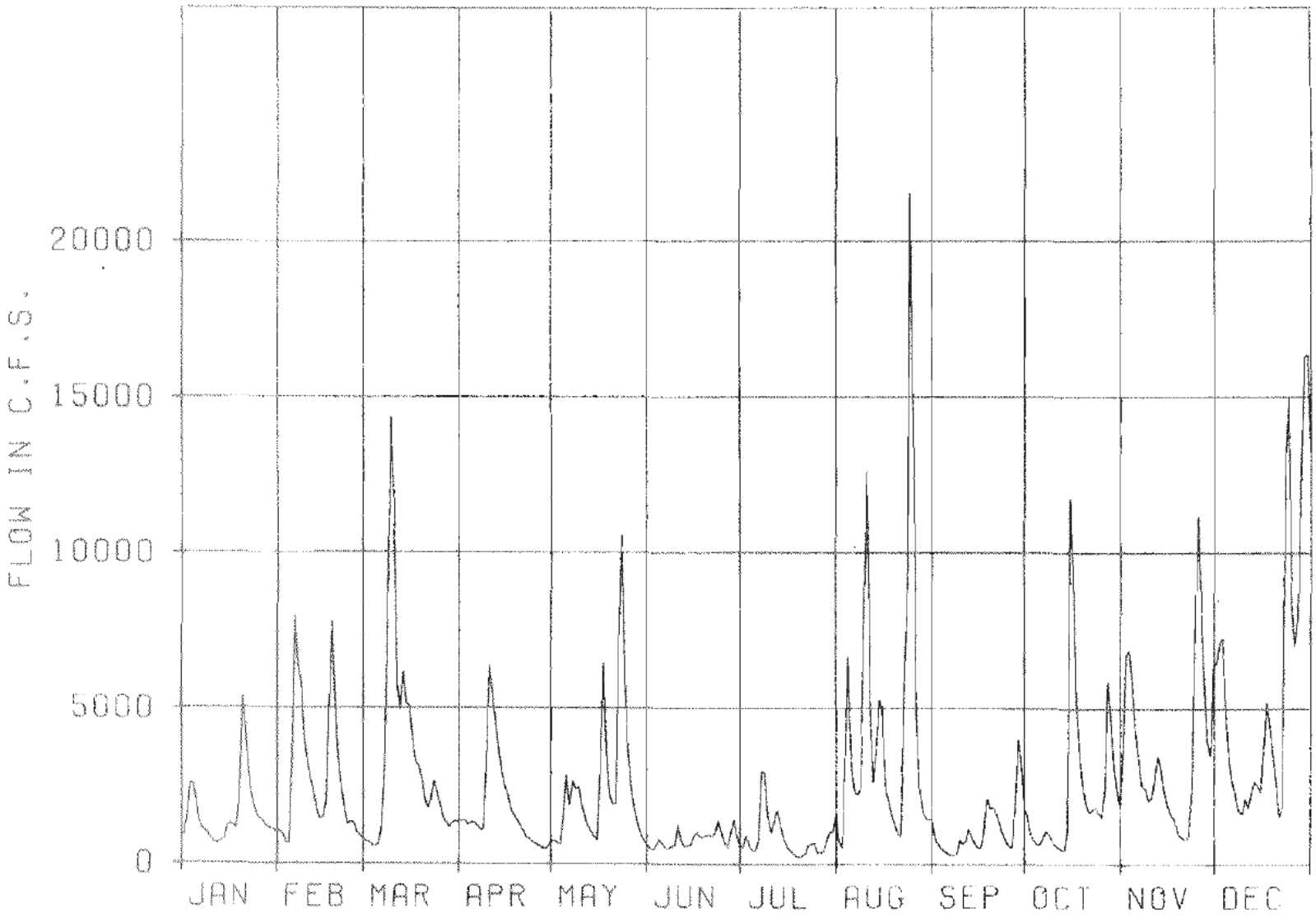


YEAR 1941

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-34

TYGART RIVER AT DAMSITE

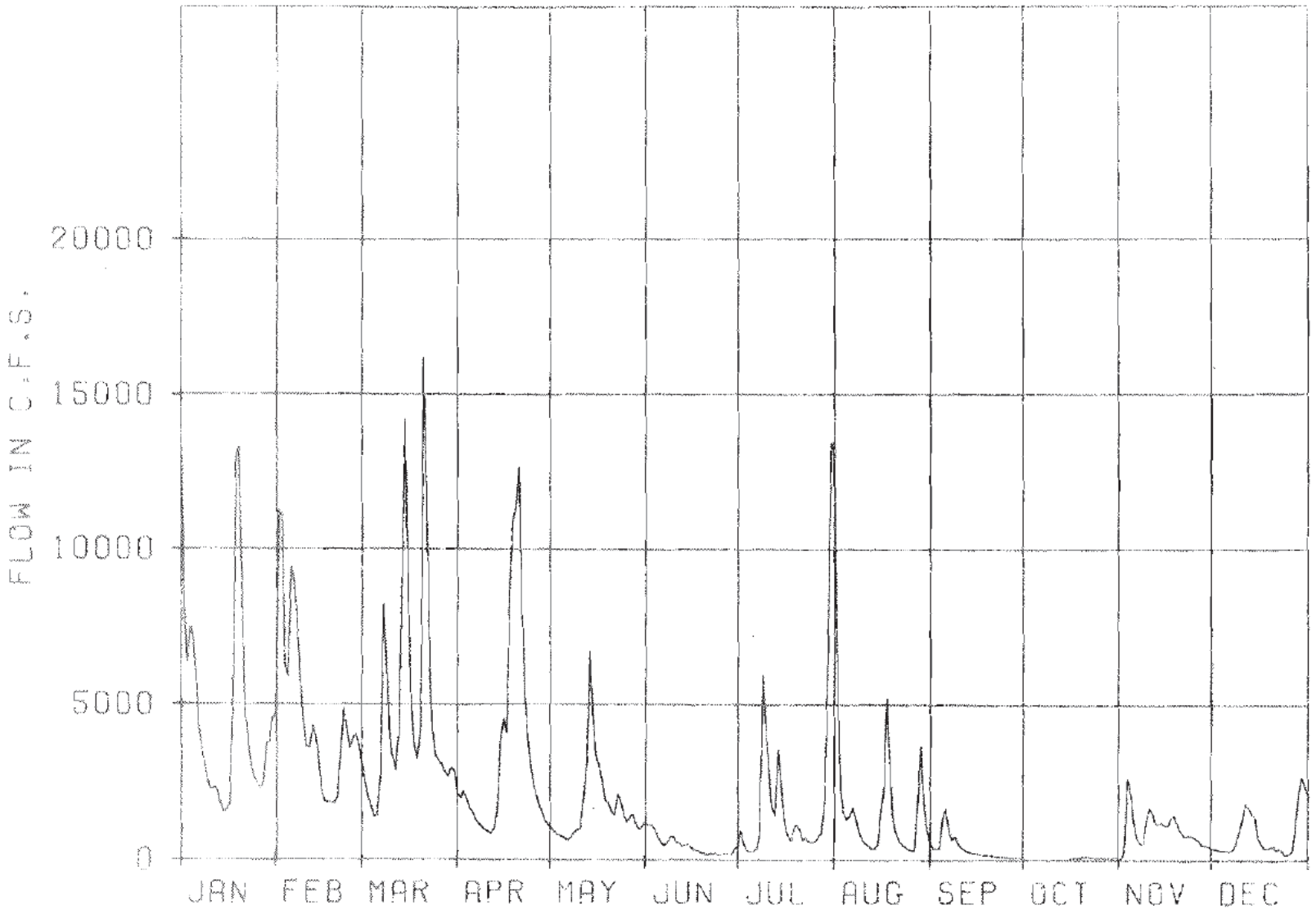


YEAR 1942

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-35

TYGART RIVER AT DAMSITE

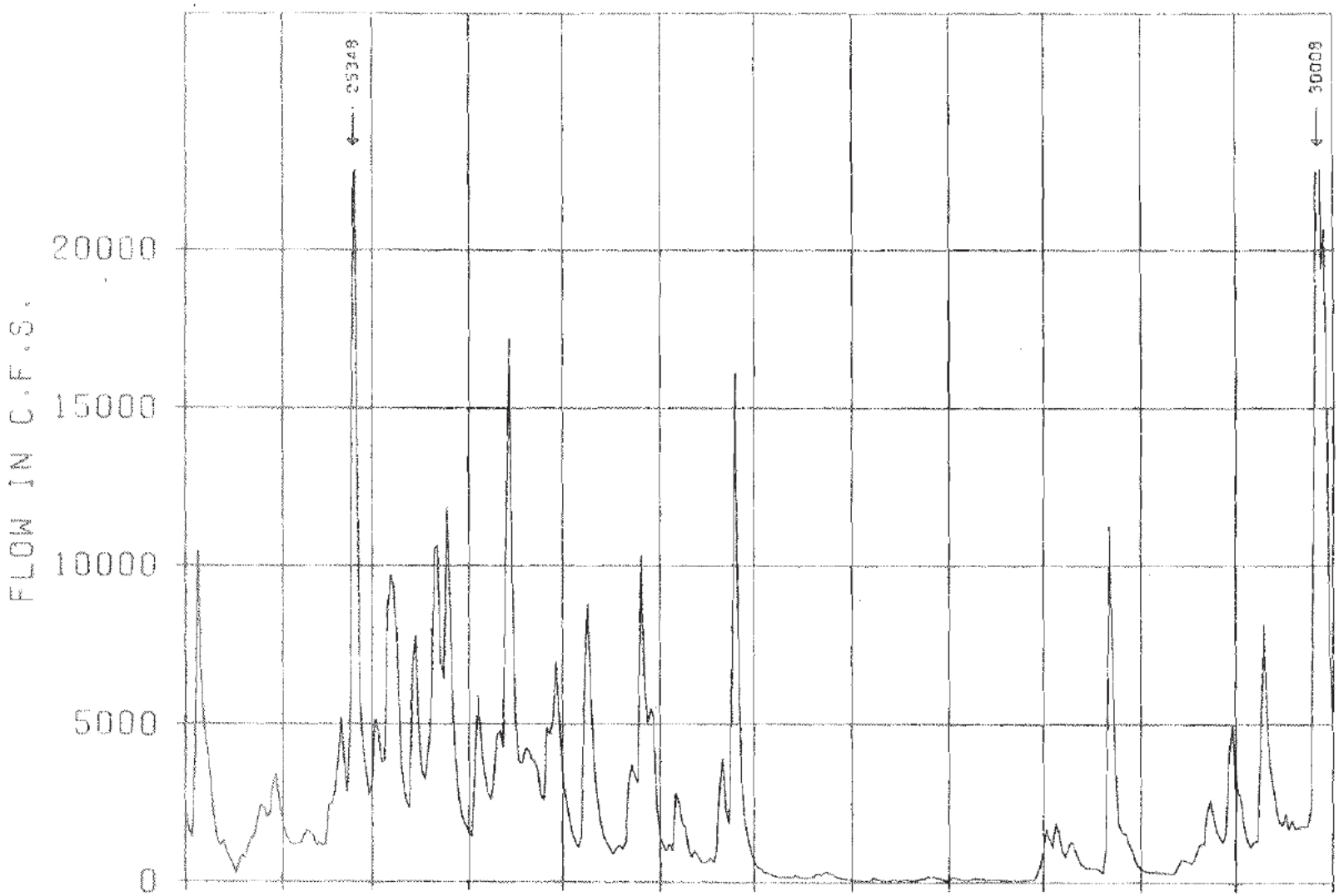


YEAR 1943

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-36

TYGART RIVER AT DAMSITE



YEAR 1944

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-37

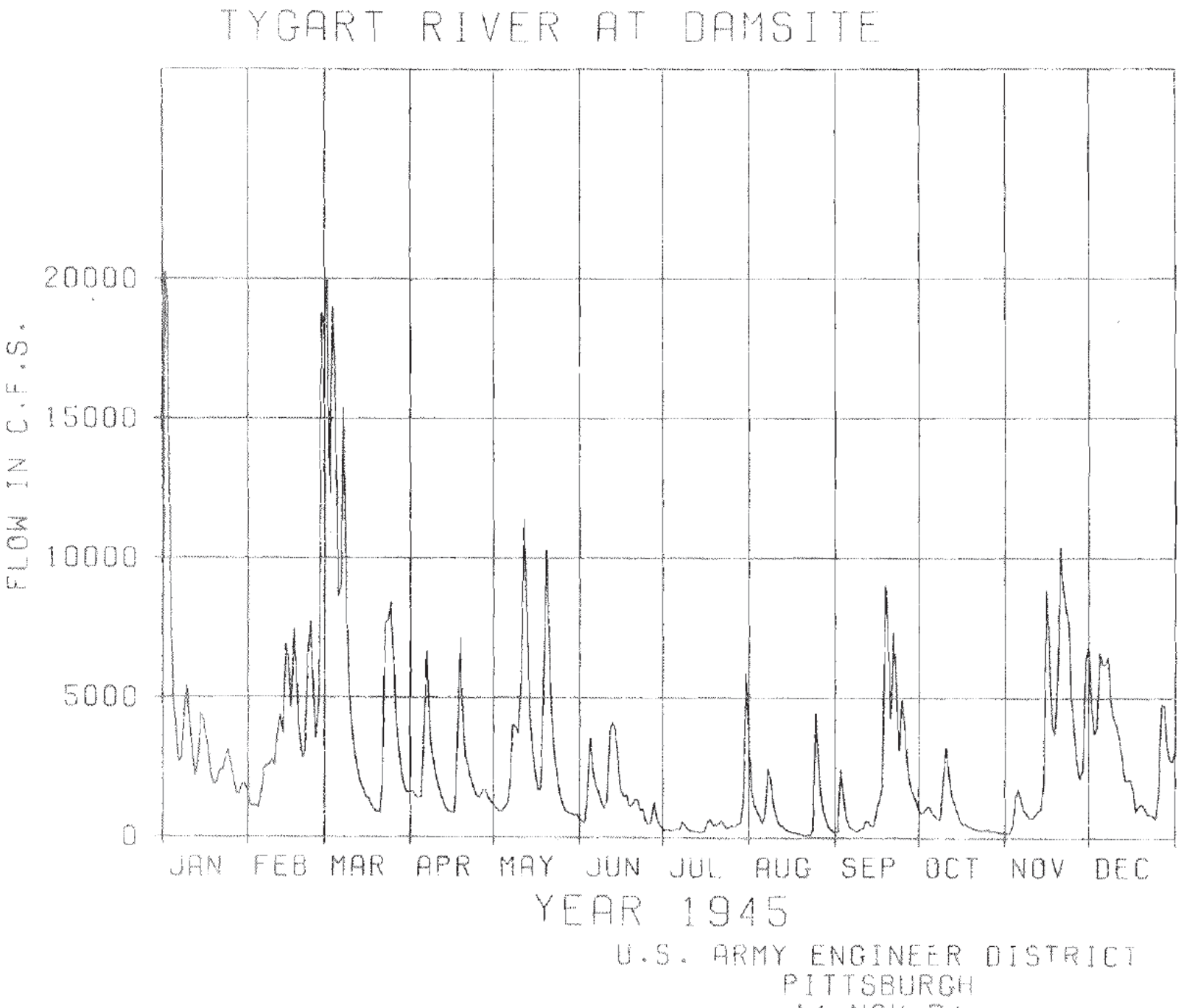
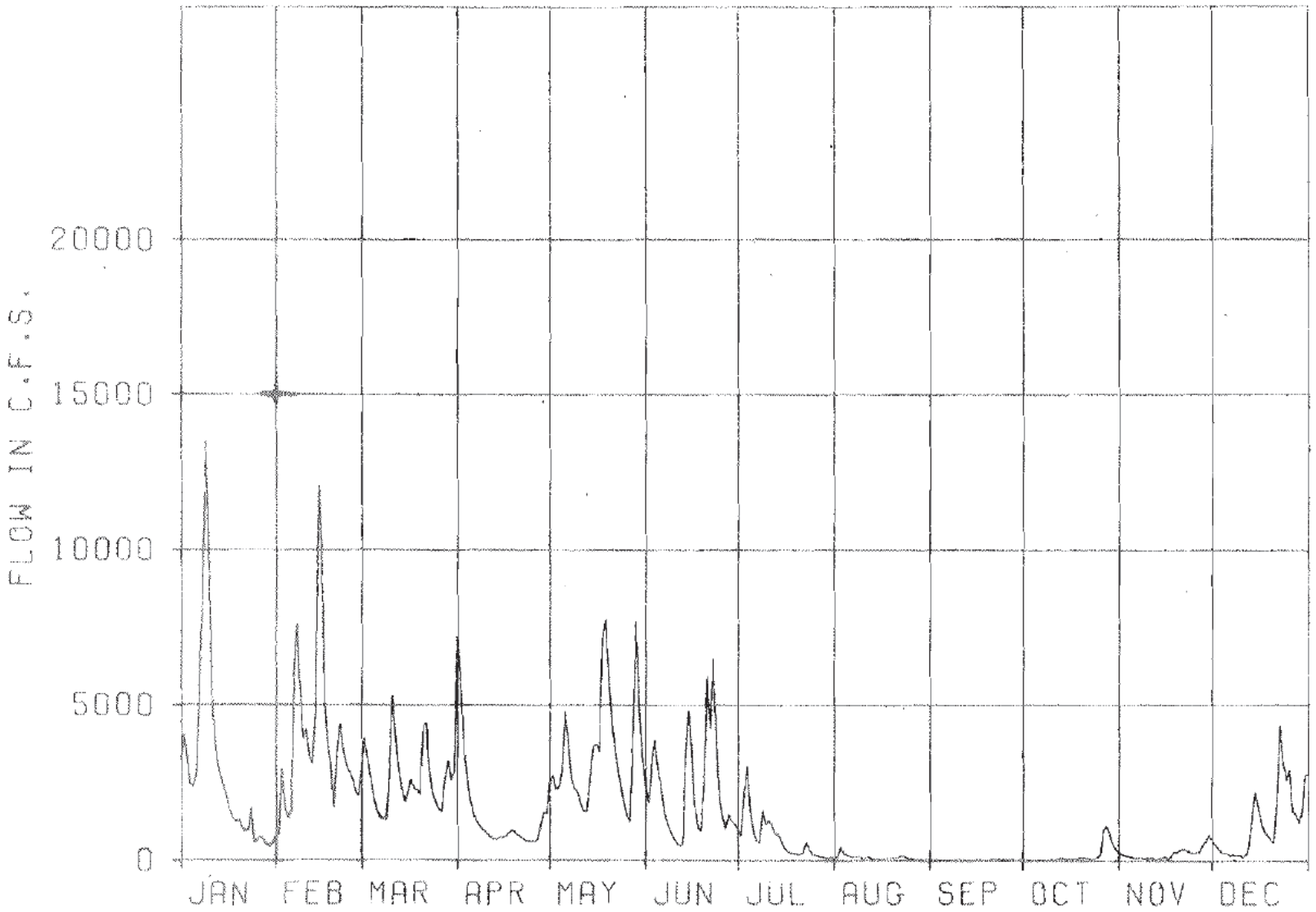

TYGART RIVER AT DAMSITE
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1945
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-38

TYGART RIVER AT DAMSITE

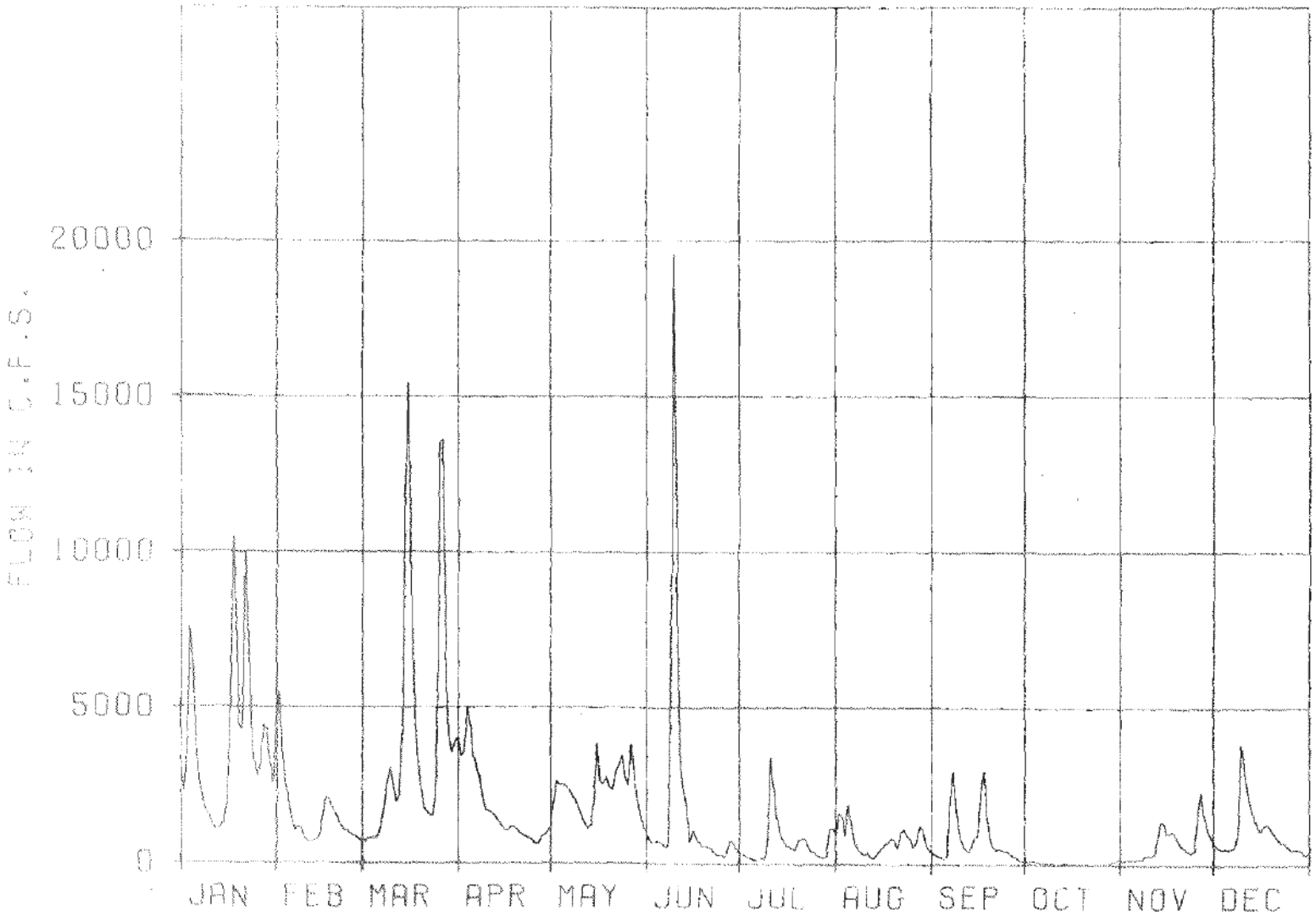


YEAR 1946

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-39

TYGART RIVER AT DAMSITE

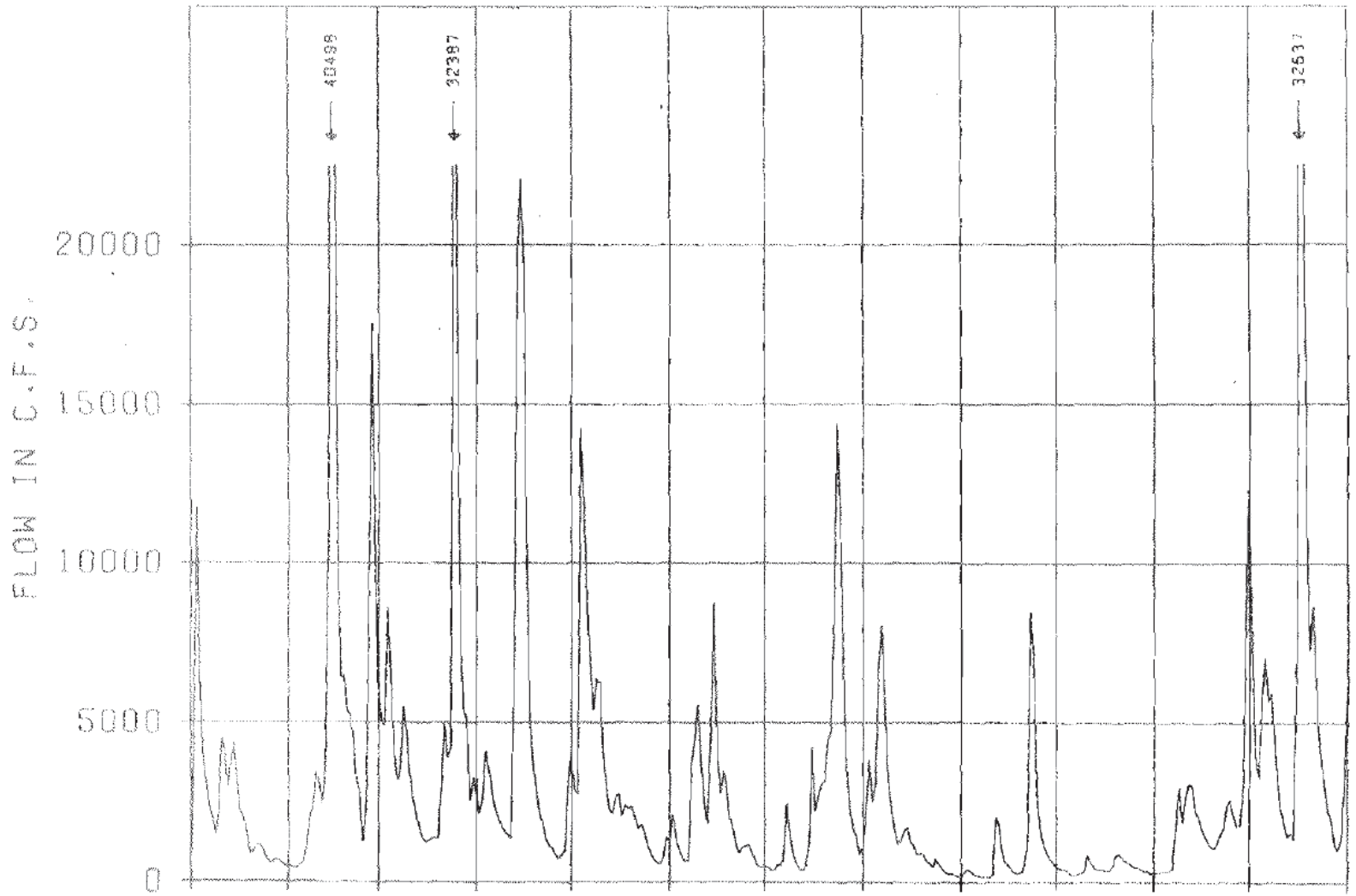


YEAR 1947

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-3

TYGART RIVER AT DAMSITE

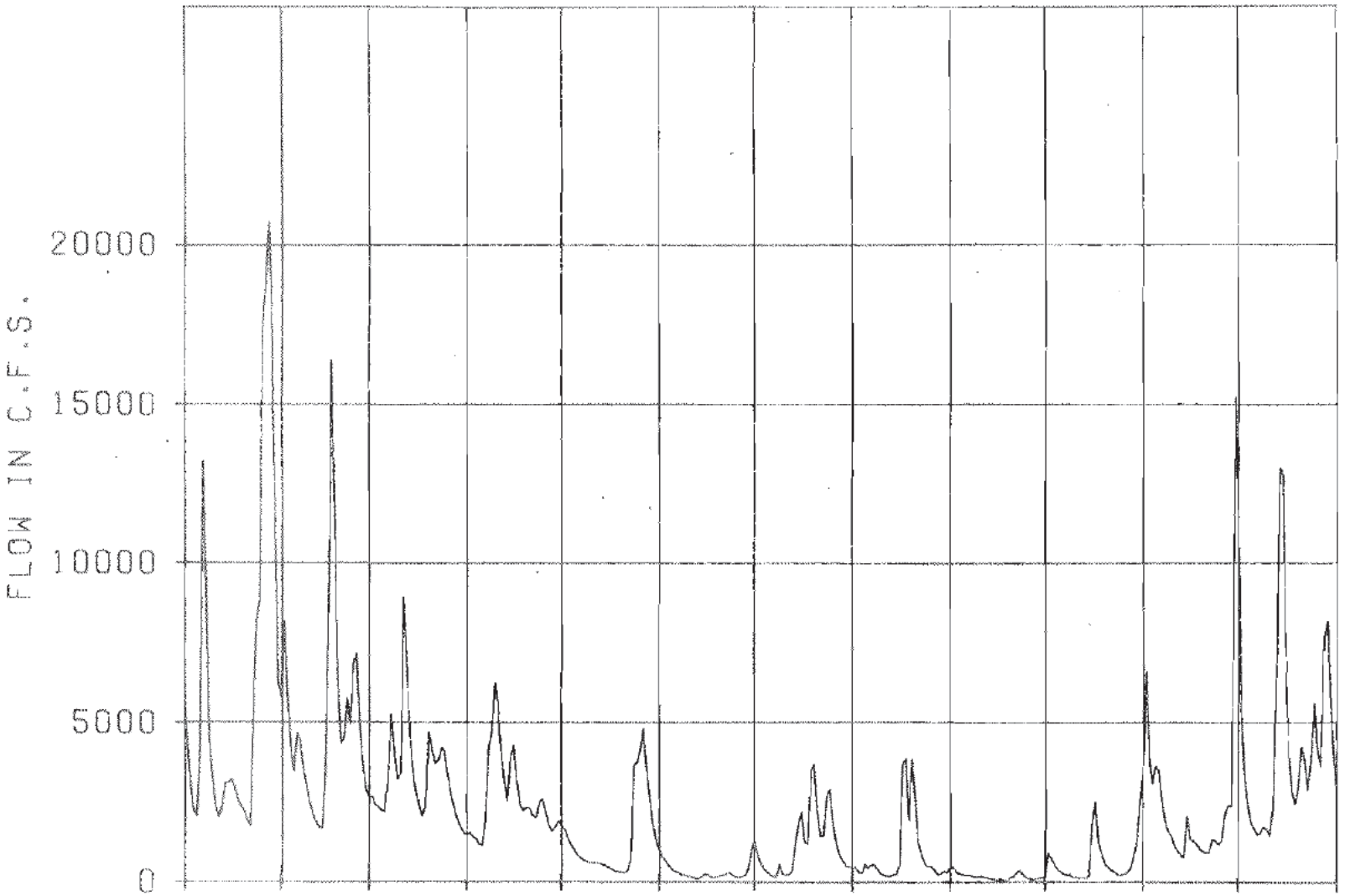


YEAR 1948

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-41

TYGART RIVER AT DAMSITE

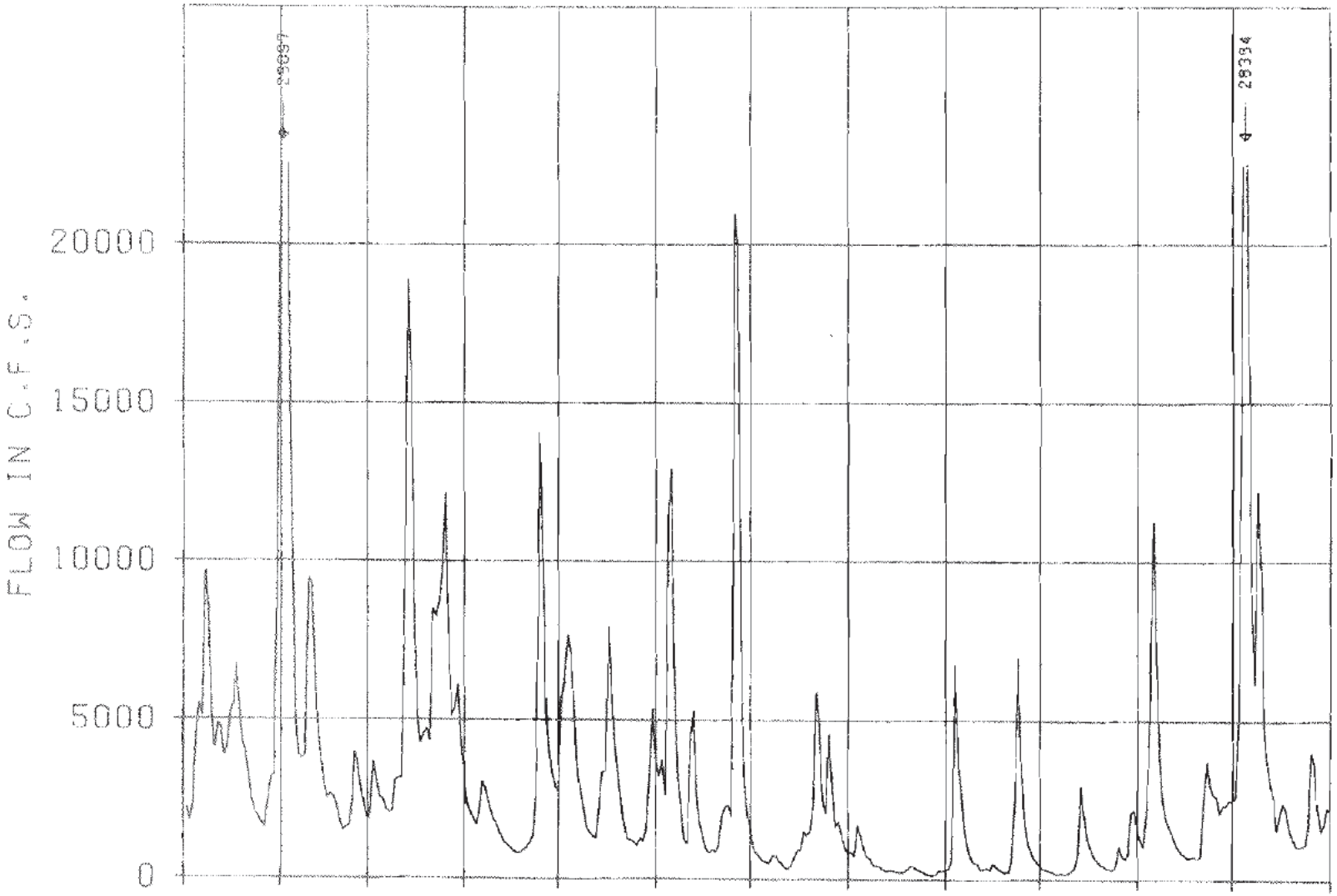


YEAR 1949

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-42

TYGART RIVER AT DAMSITE

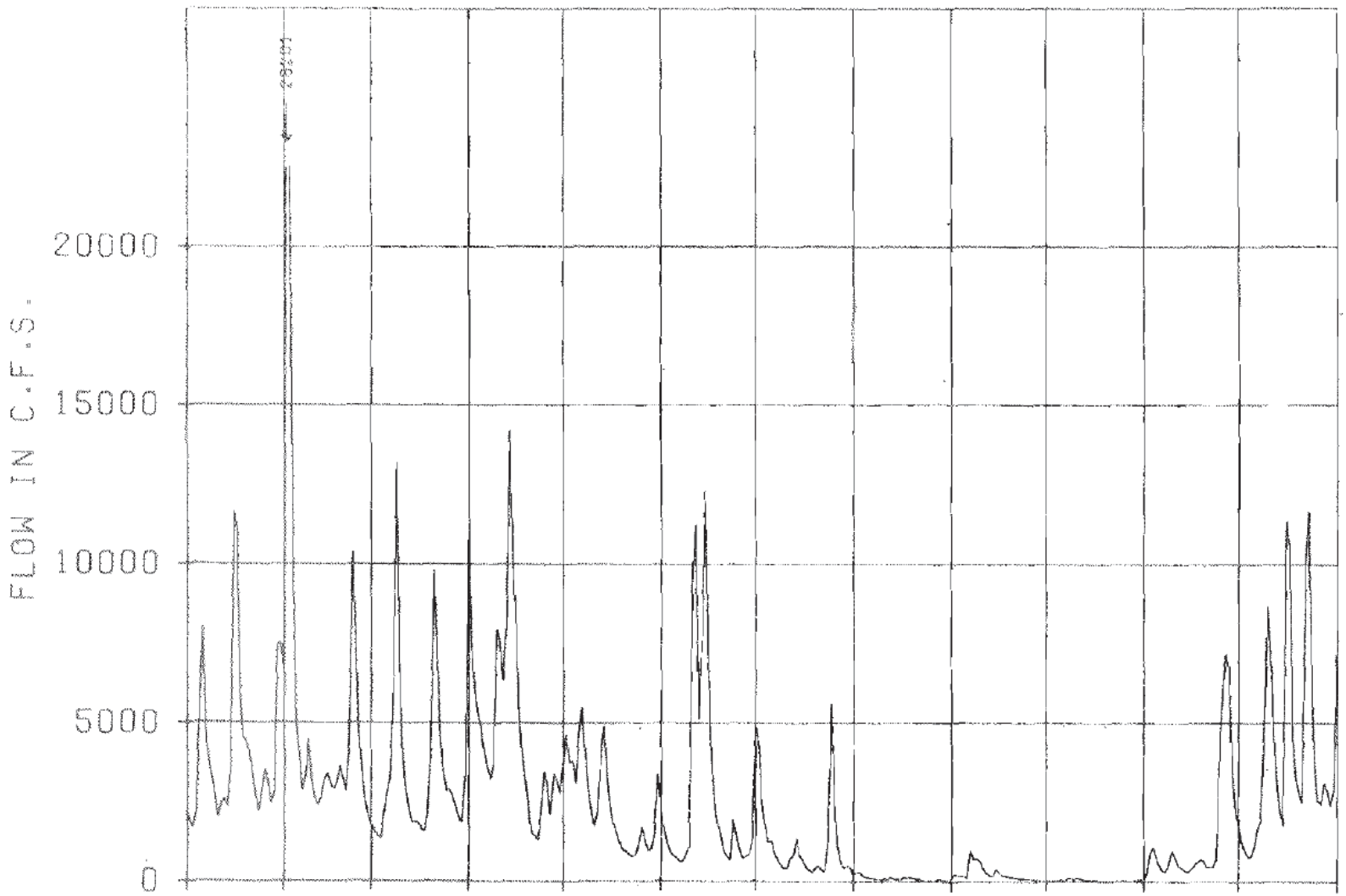


YEAR 1950

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-43

TYGART RIVER AT DAMSITE

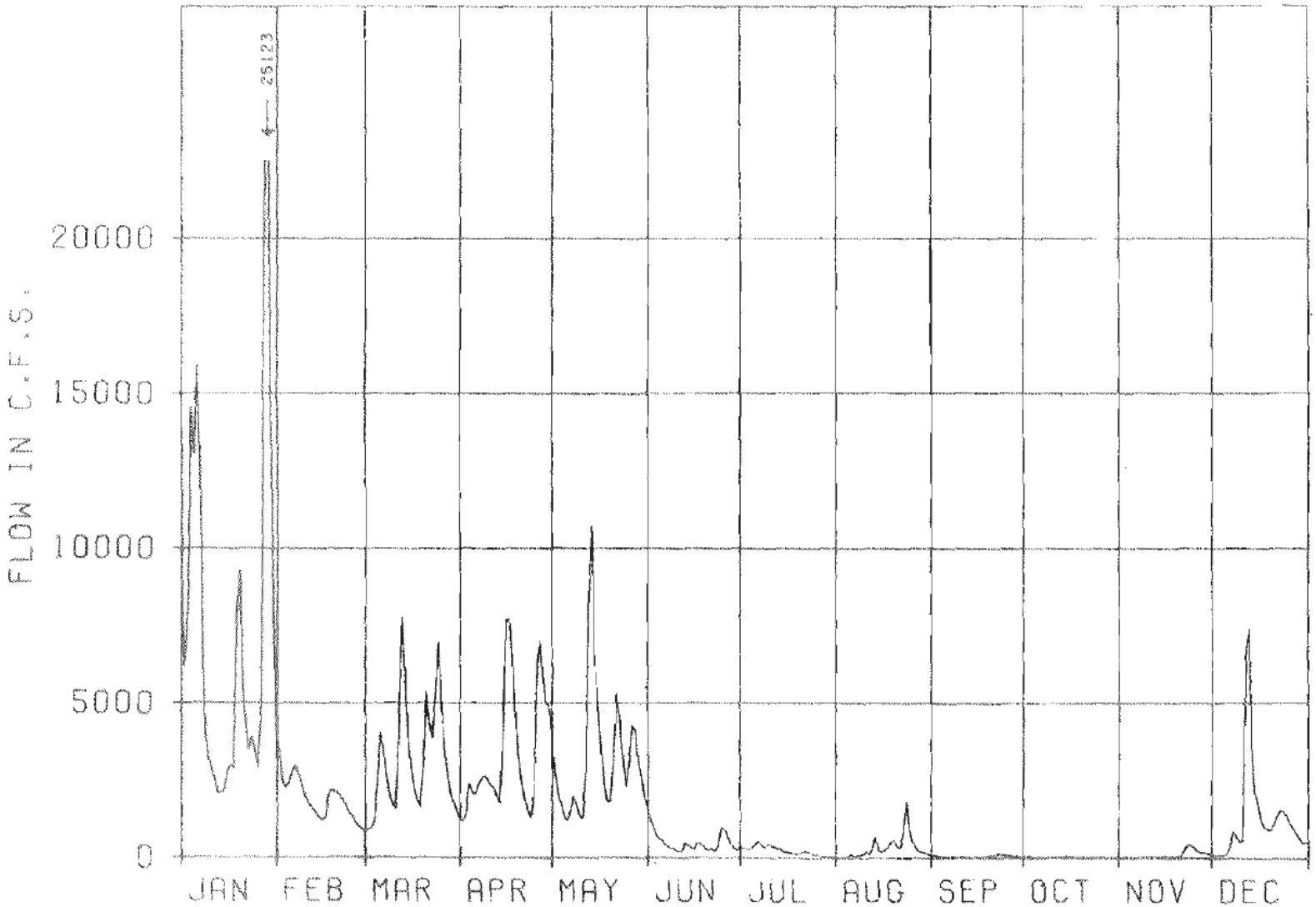


YEAR 1951

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-44

TYGART RIVER AT DAMSITE

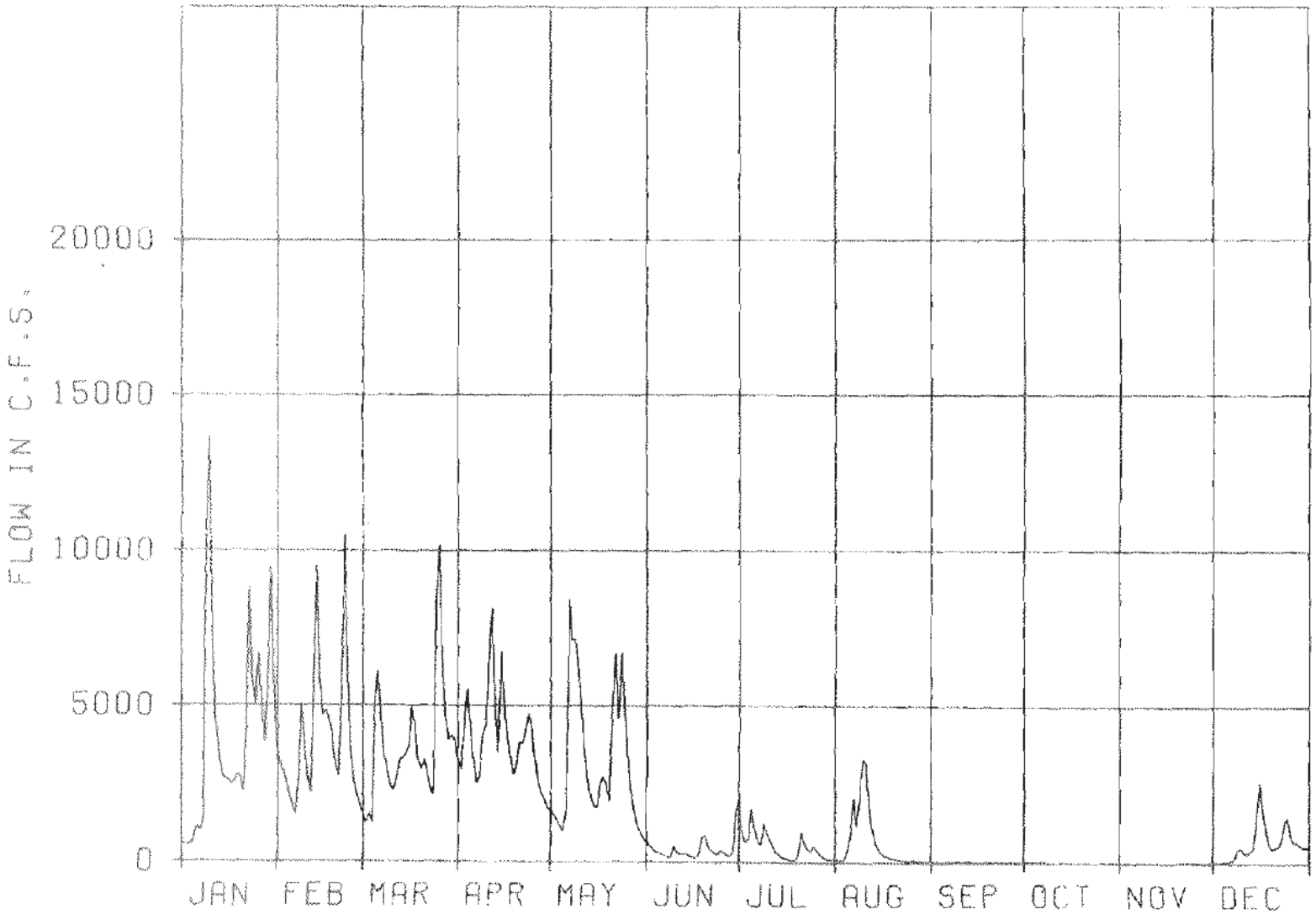


YEAR 1952

U.S ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-45

TYGART RIVER AT DAMSITE

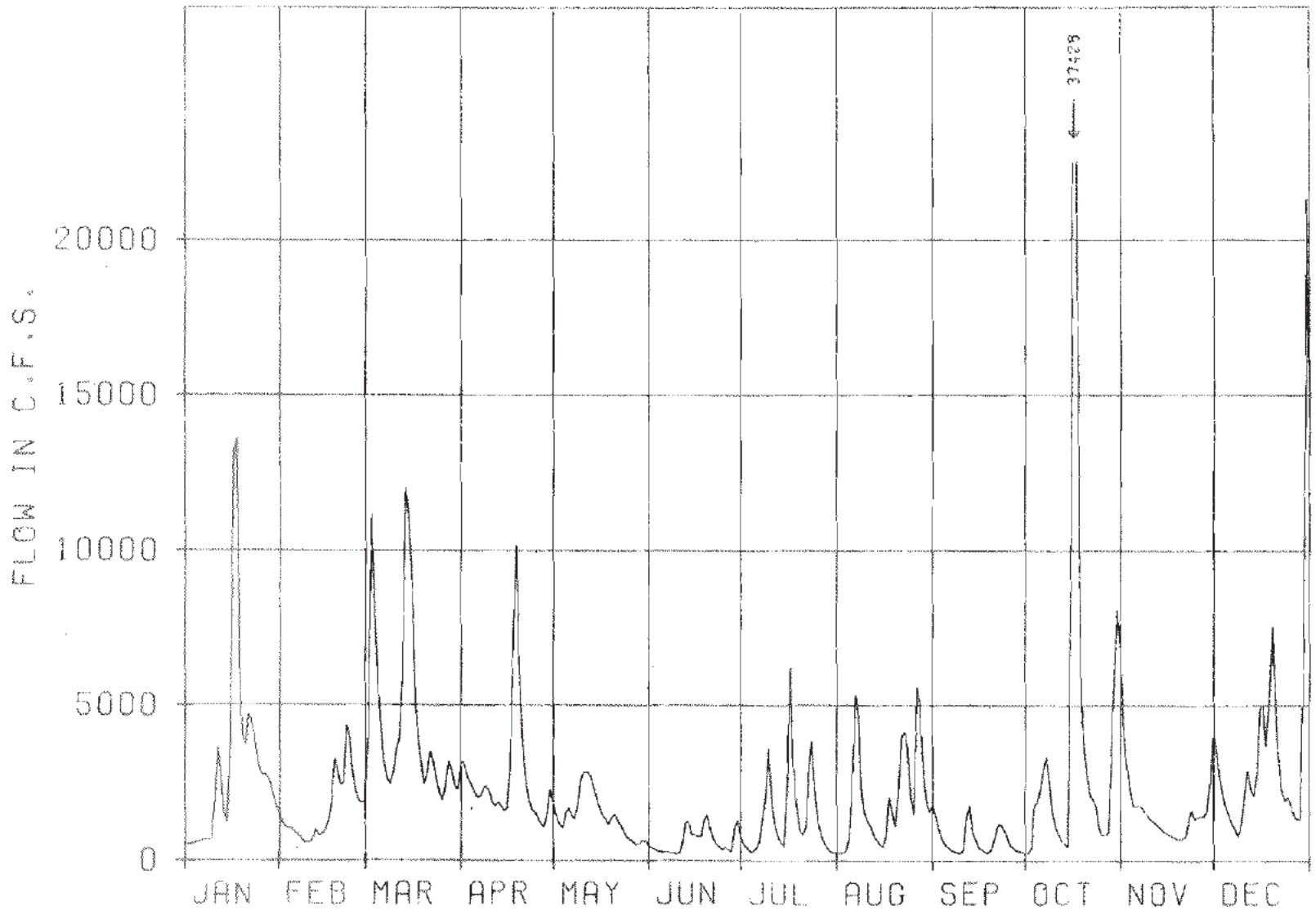


YEAR 1953

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 22-46

TYGART RIVER AT DAMSITE

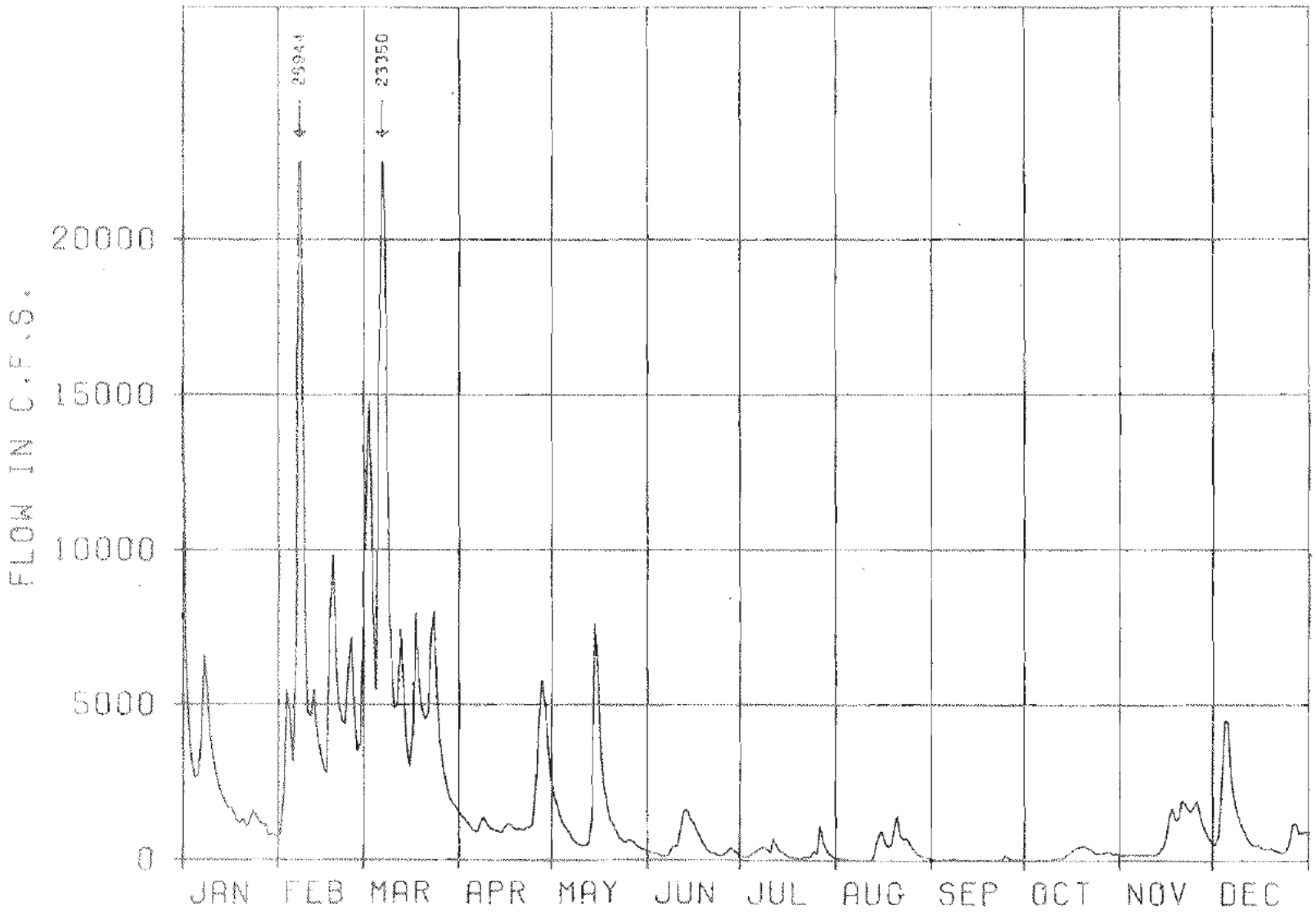


YEAR 1954

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-47

TYGART RIVER AT DAMSITE



YEAR 1955

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-48

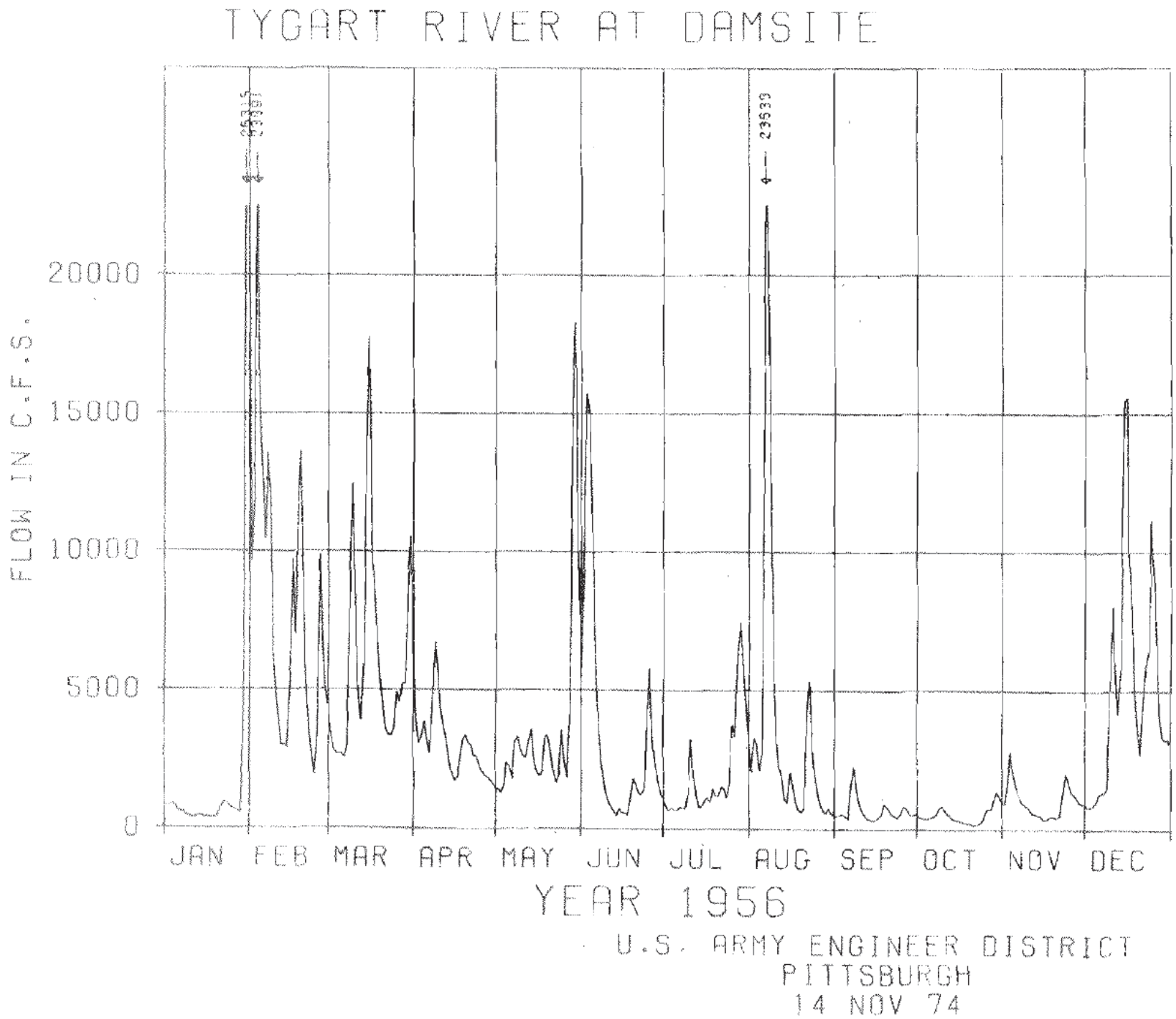
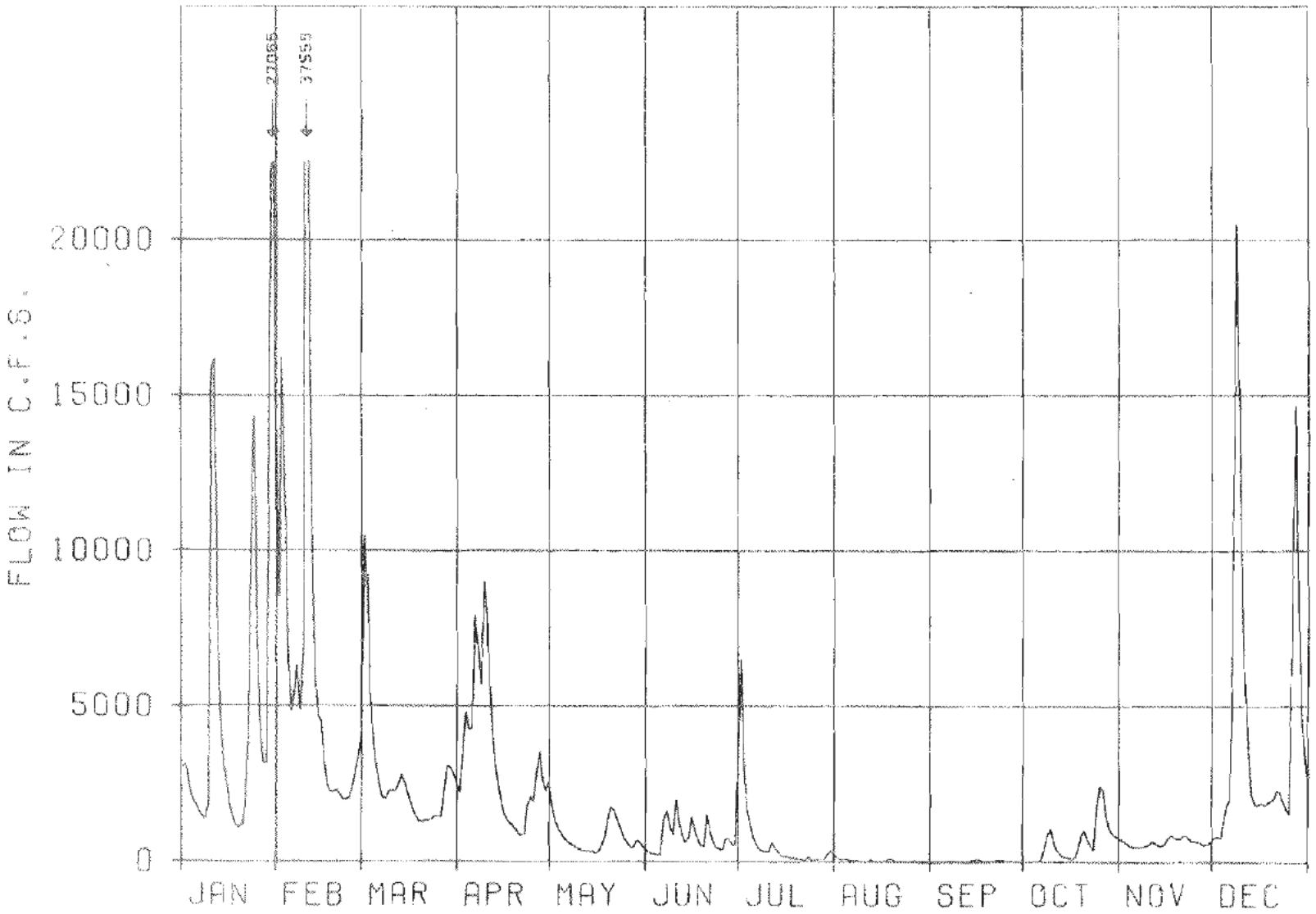

TYGART RIVER AT DAMSITE
23533
FLOW IN C.F.S.
20000
15000
10000
5000
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
YEAR 1956
U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-44

TYGART RIVER AT DAMSITE

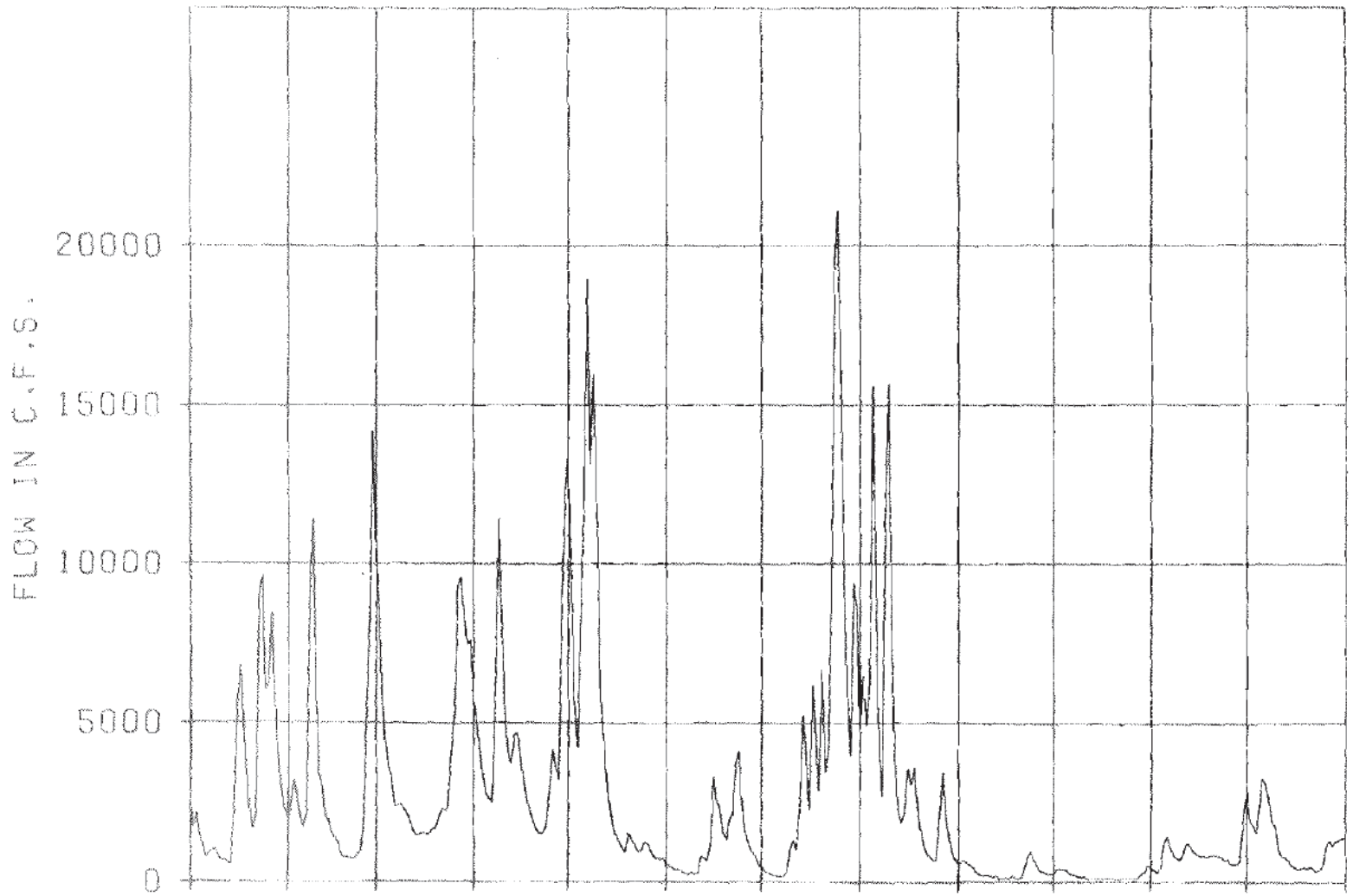


YEAR 1957

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-50

TYGART RIVER AT DAMSITE

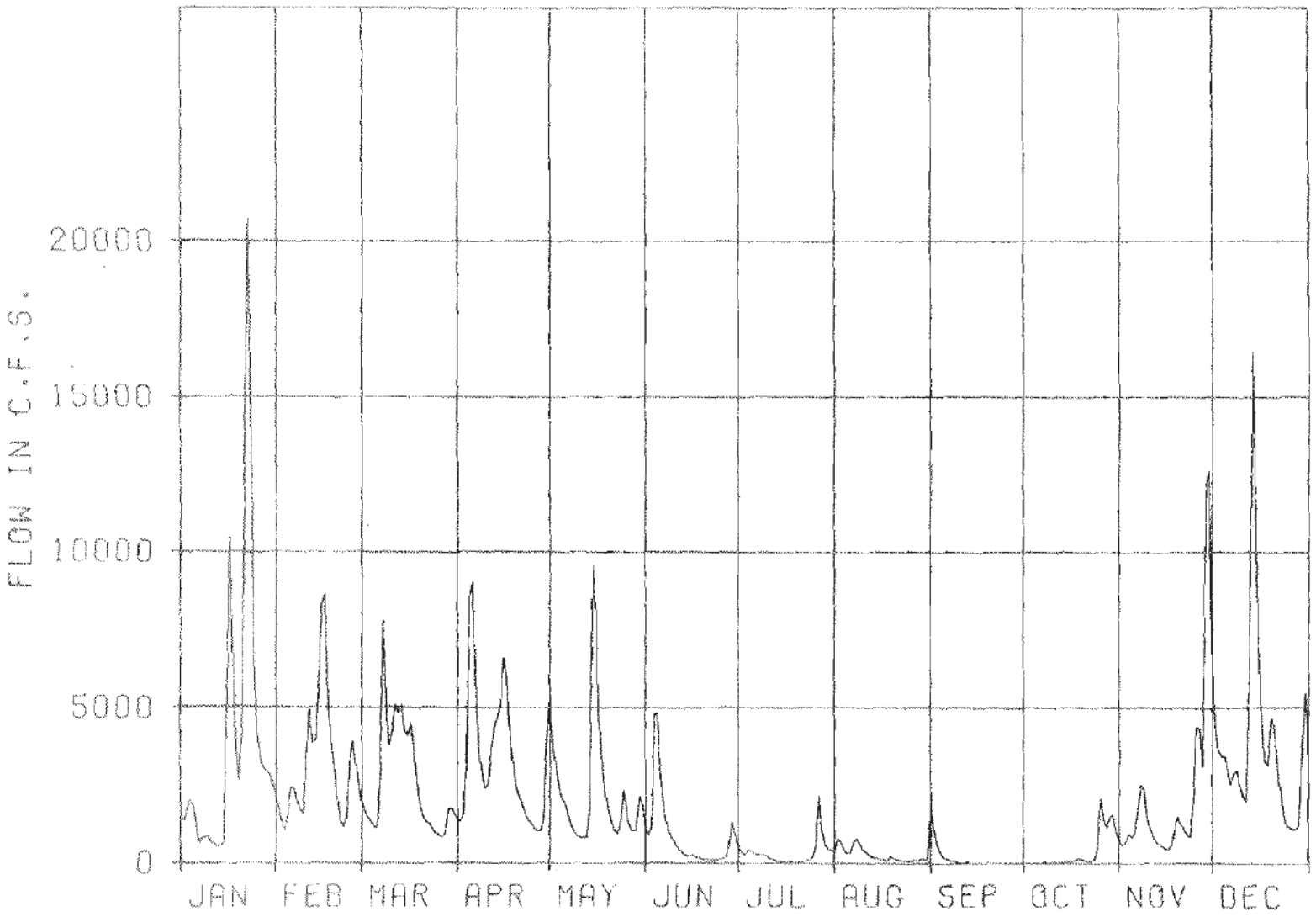


YEAR 1958

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-51

TYGART RIVER AT DAMSITE

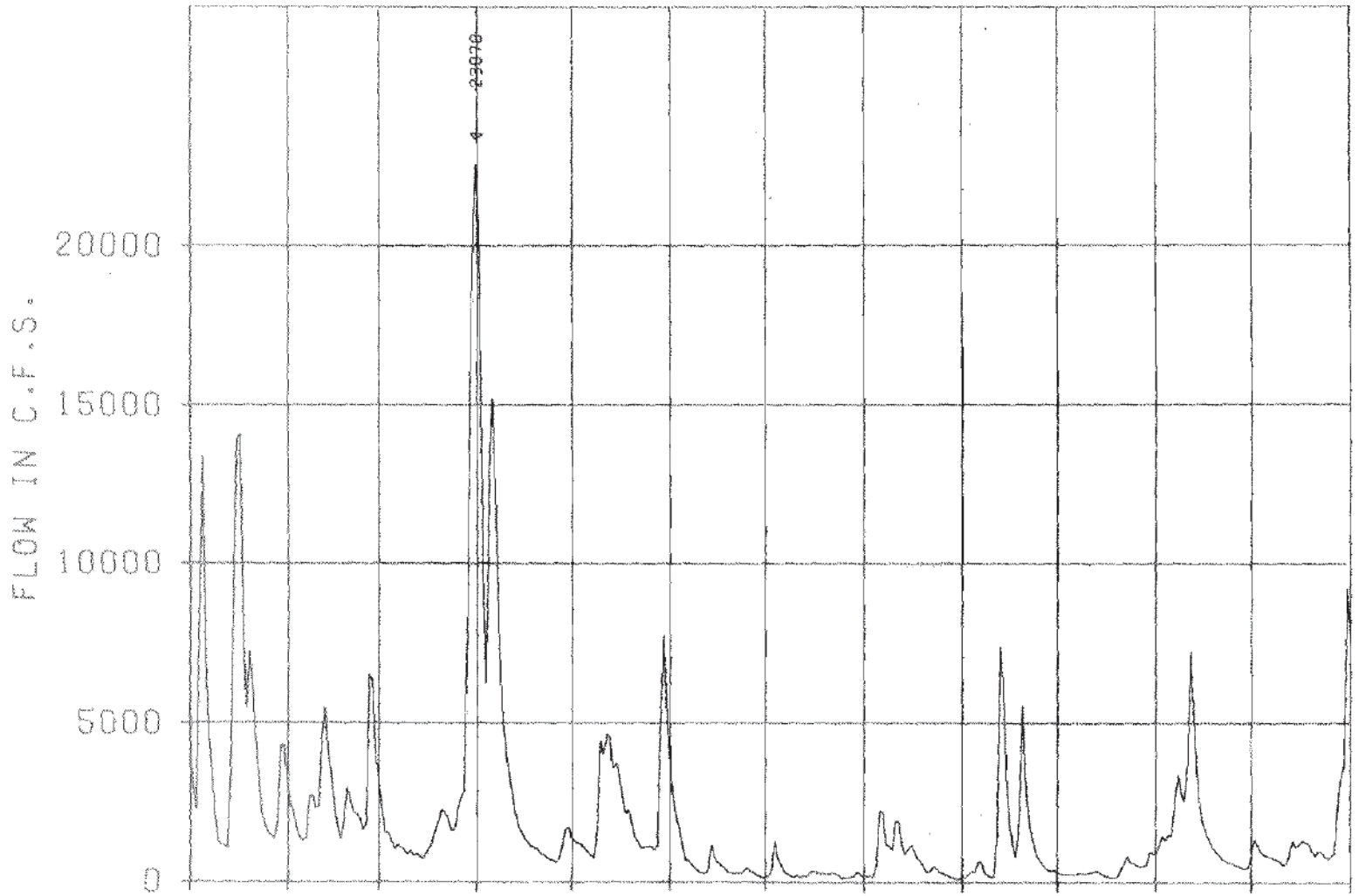


YEAR 1959

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV '74

PLATE 23-52

TYGART RIVER AT DAMSITE

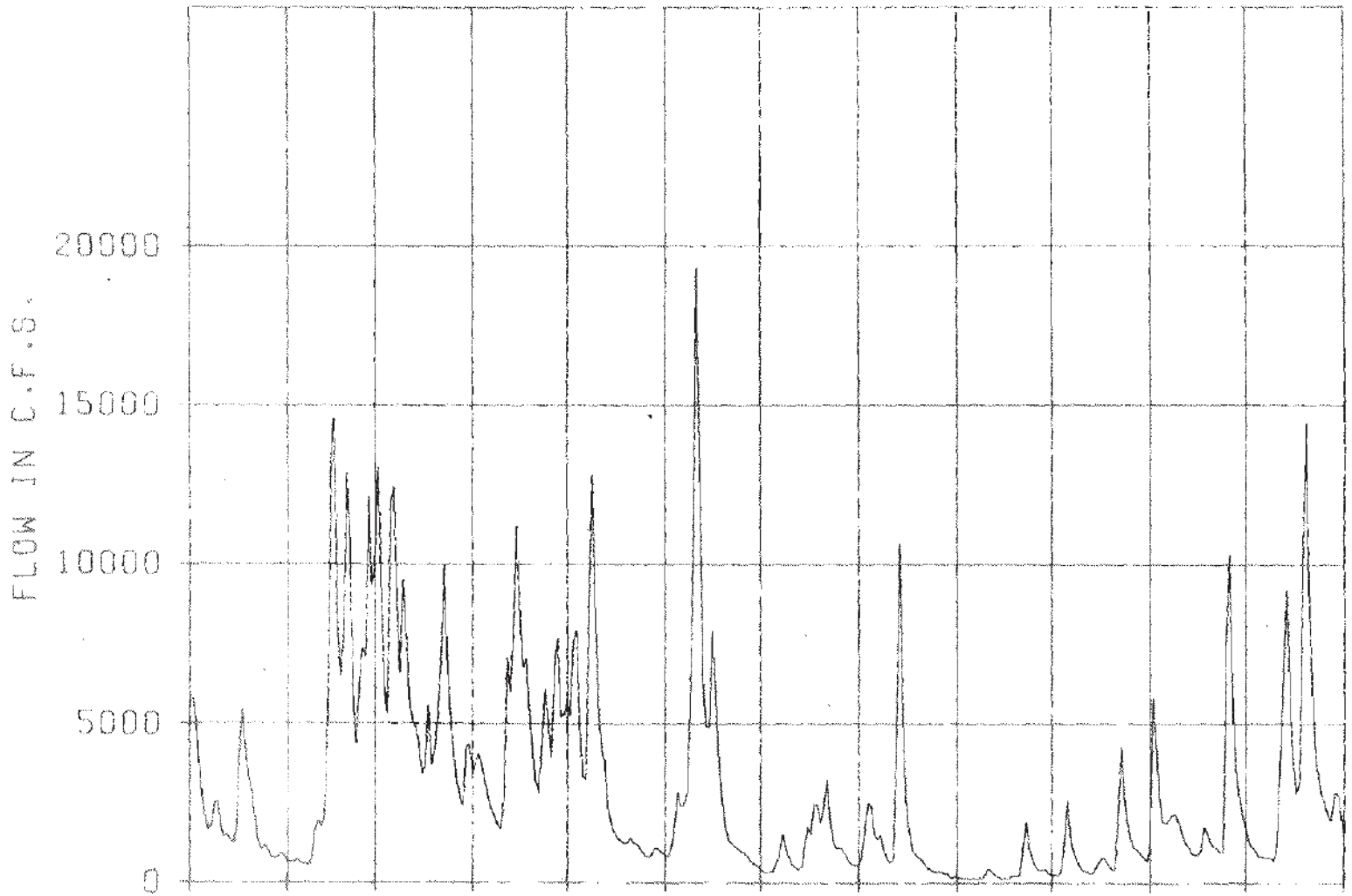


YEAR 1960

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-53

TYGART RIVER AT DAMSITE

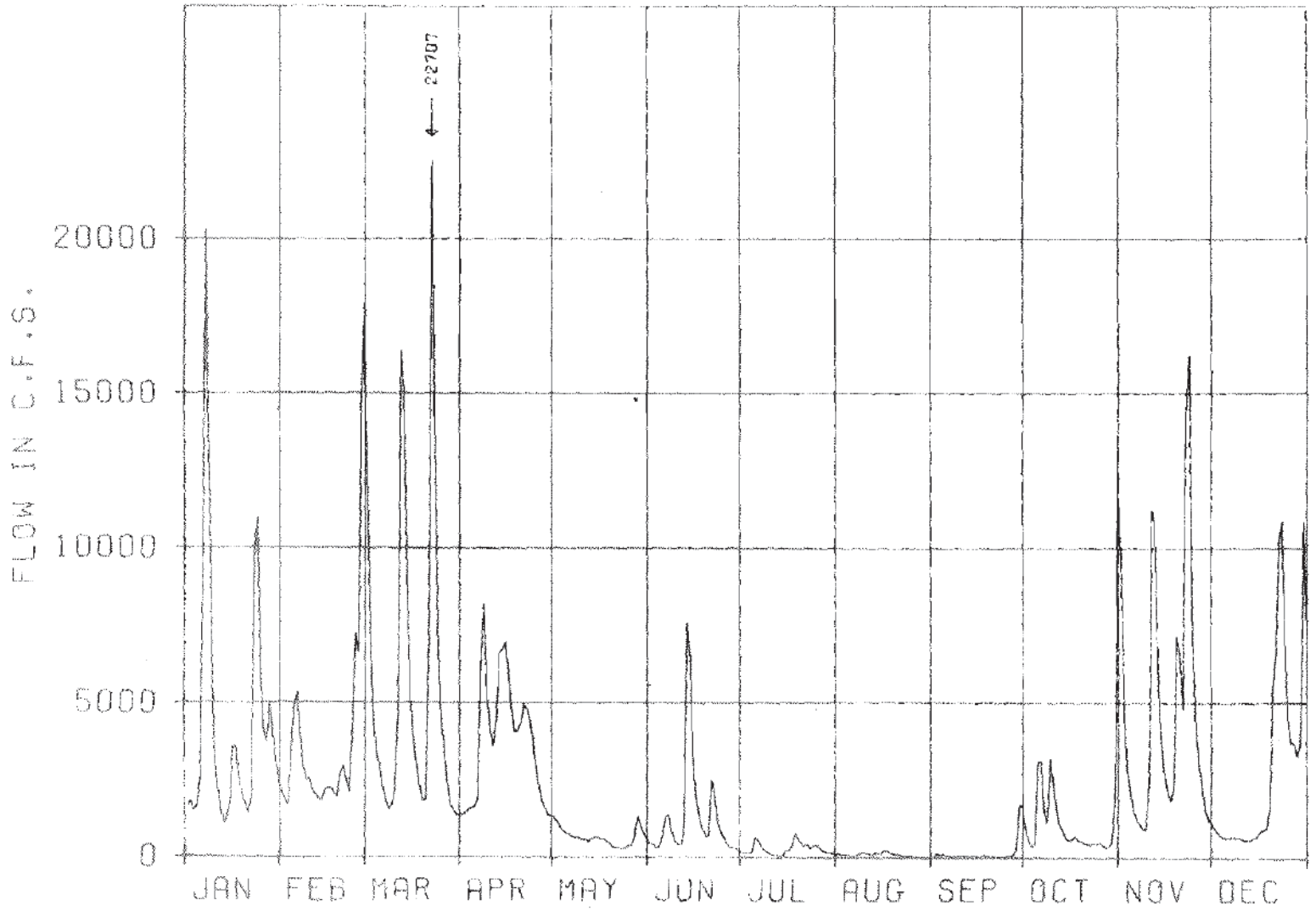


YEAR 1961

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-54

TYGART RIVER AT DAMSITE

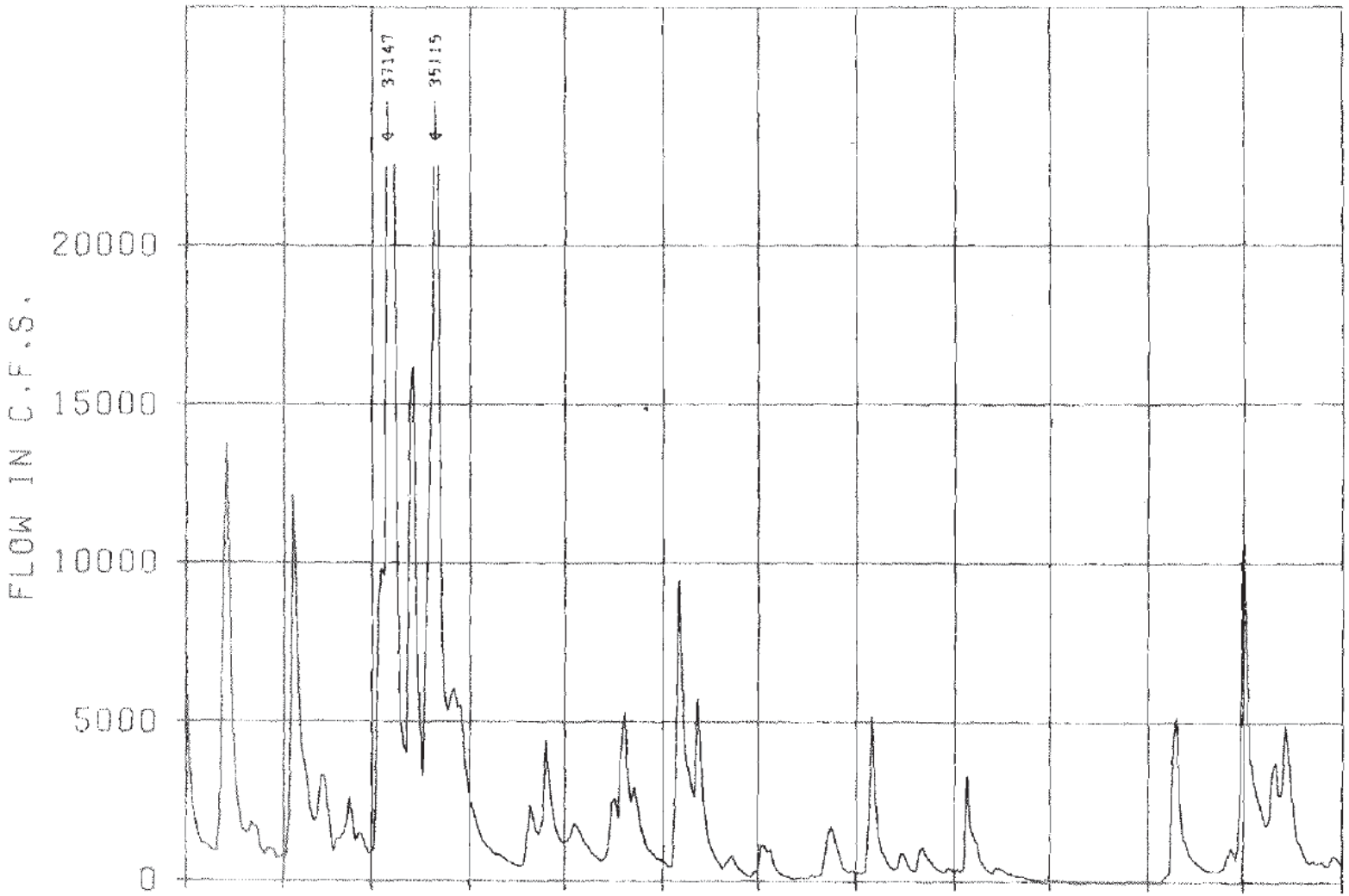


YEAR 1962

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-55

TYGART RIVER AT DAMSITE

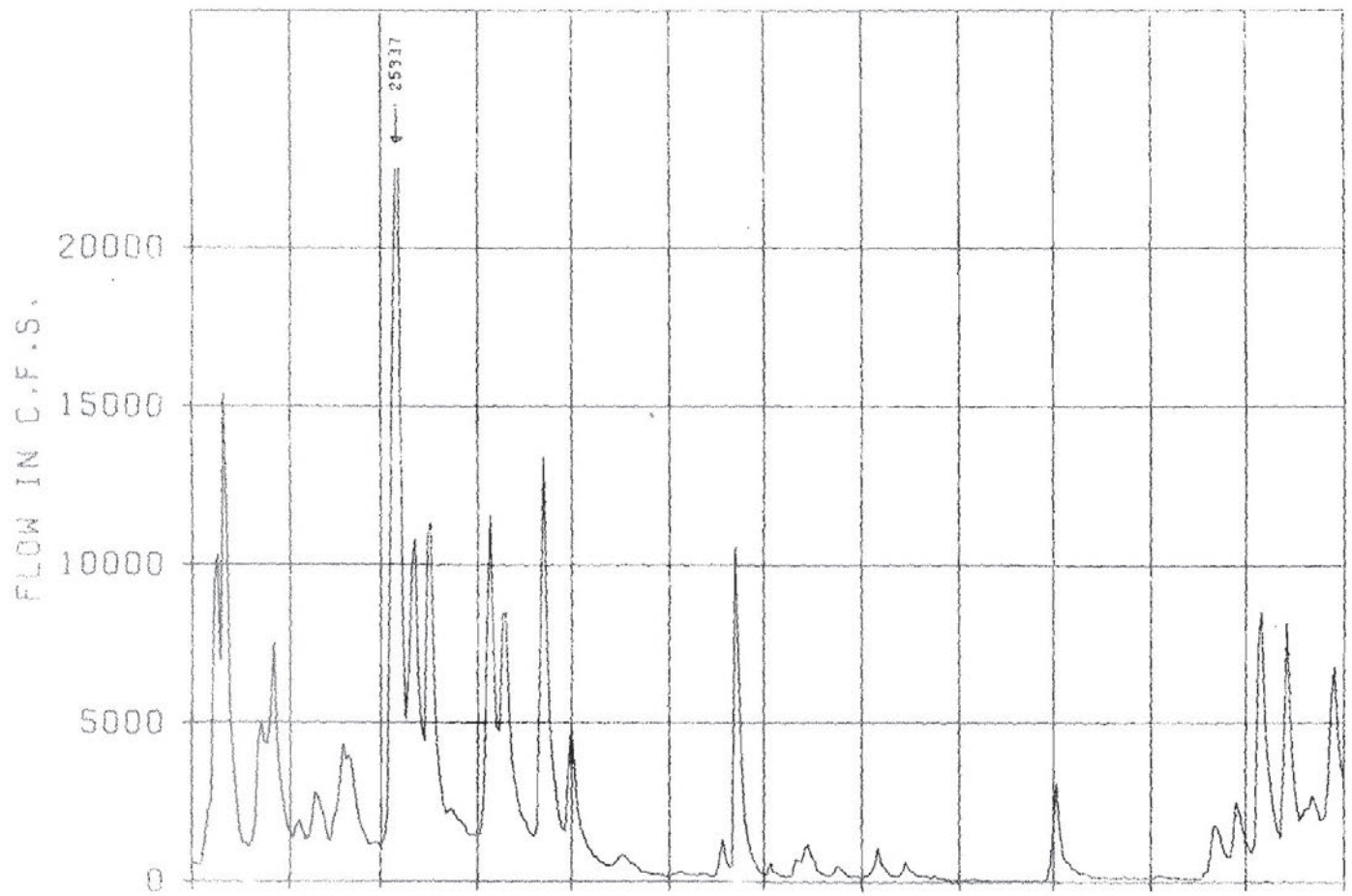


YEAR 1963

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-56

TYGART RIVER AT DAMSITE

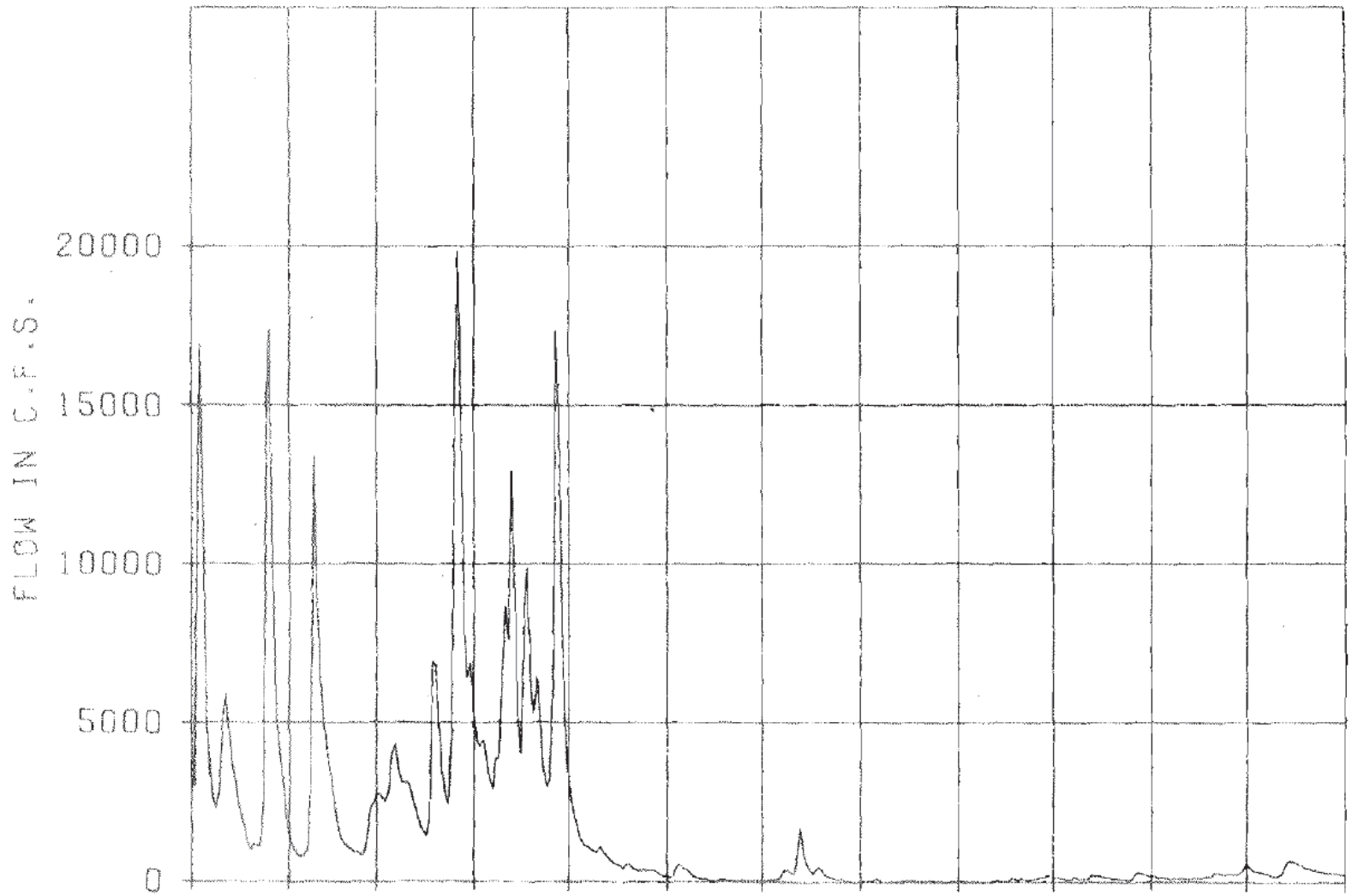


YEAR 1964

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-57

TYGART RIVER AT DAMSITE

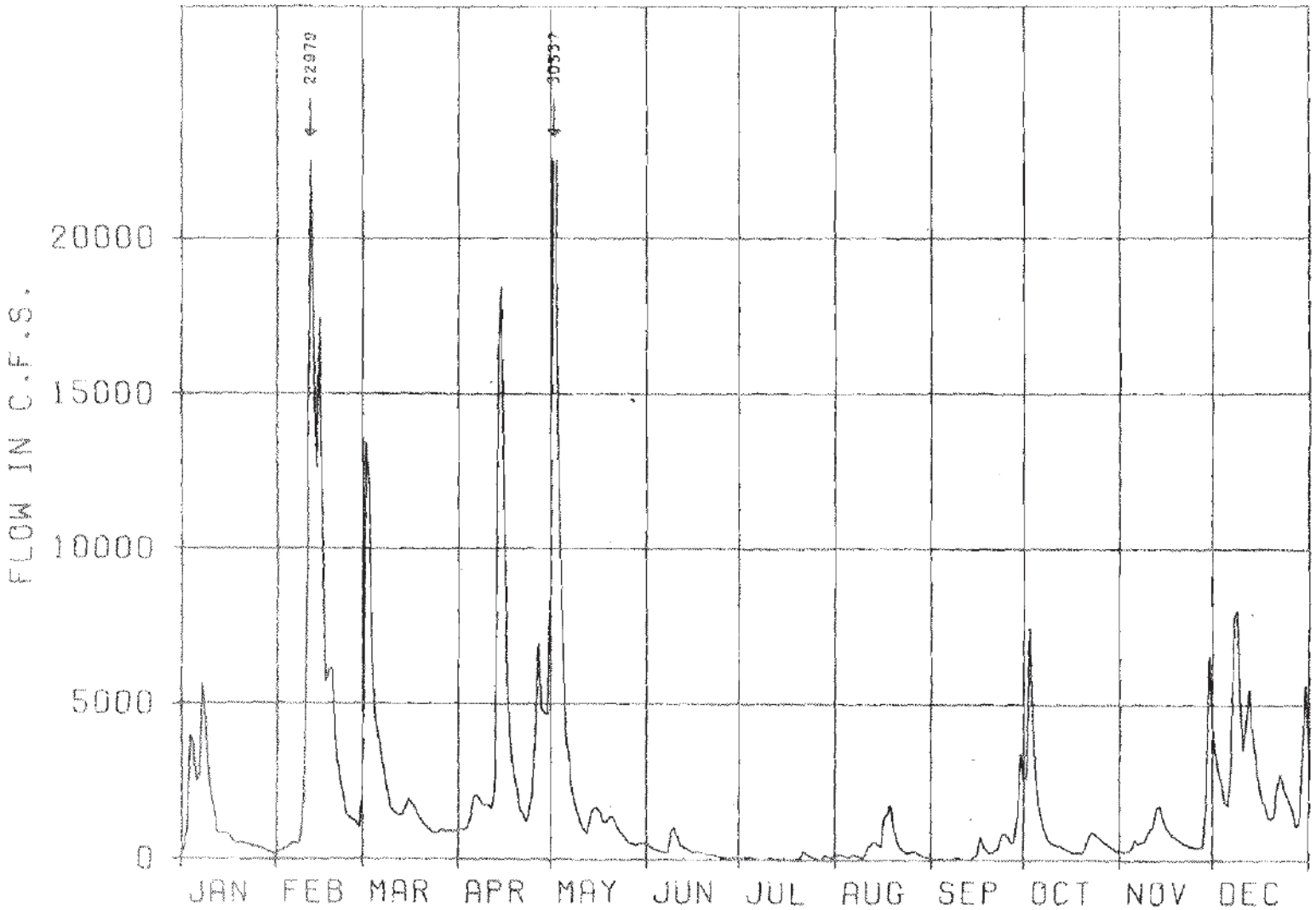


YEAR 1965

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-38

TYGART RIVER AT DAMSITE

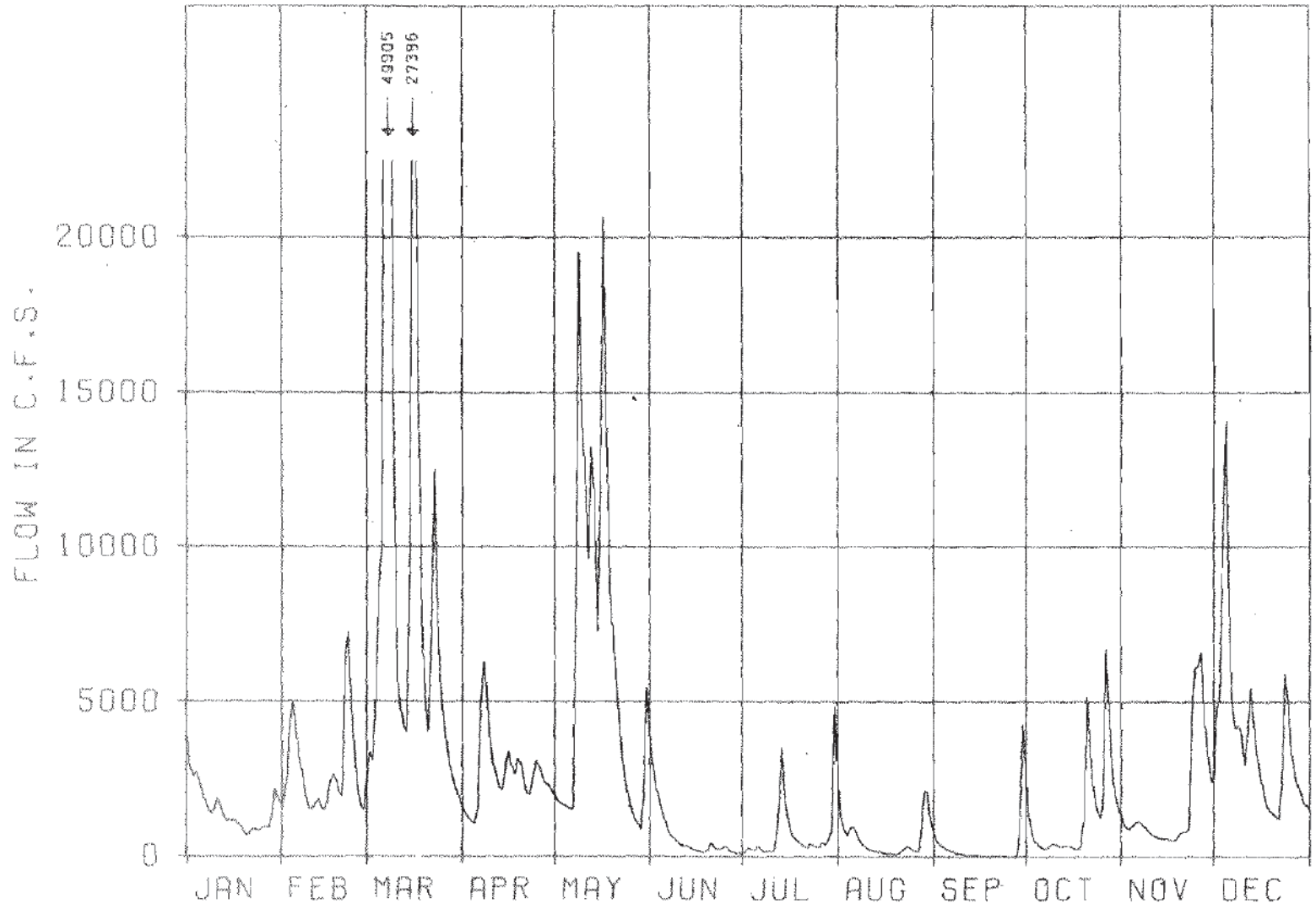


YEAR 1966

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV '74

PLATE 23-59

TYGART RIVER AT DAMSITE

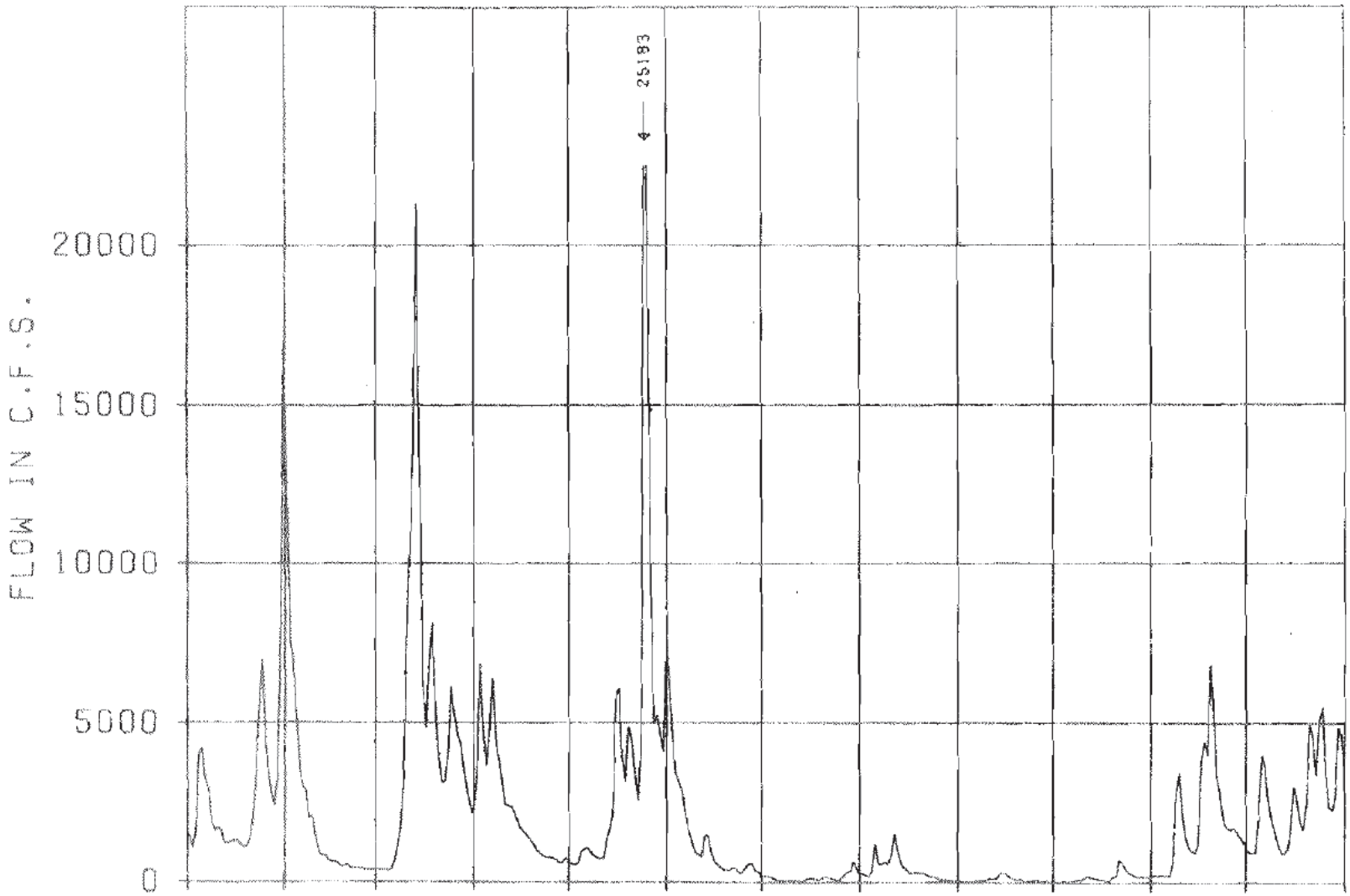


YEAR 1967

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-60

TYGART RIVER AT DAMSITE

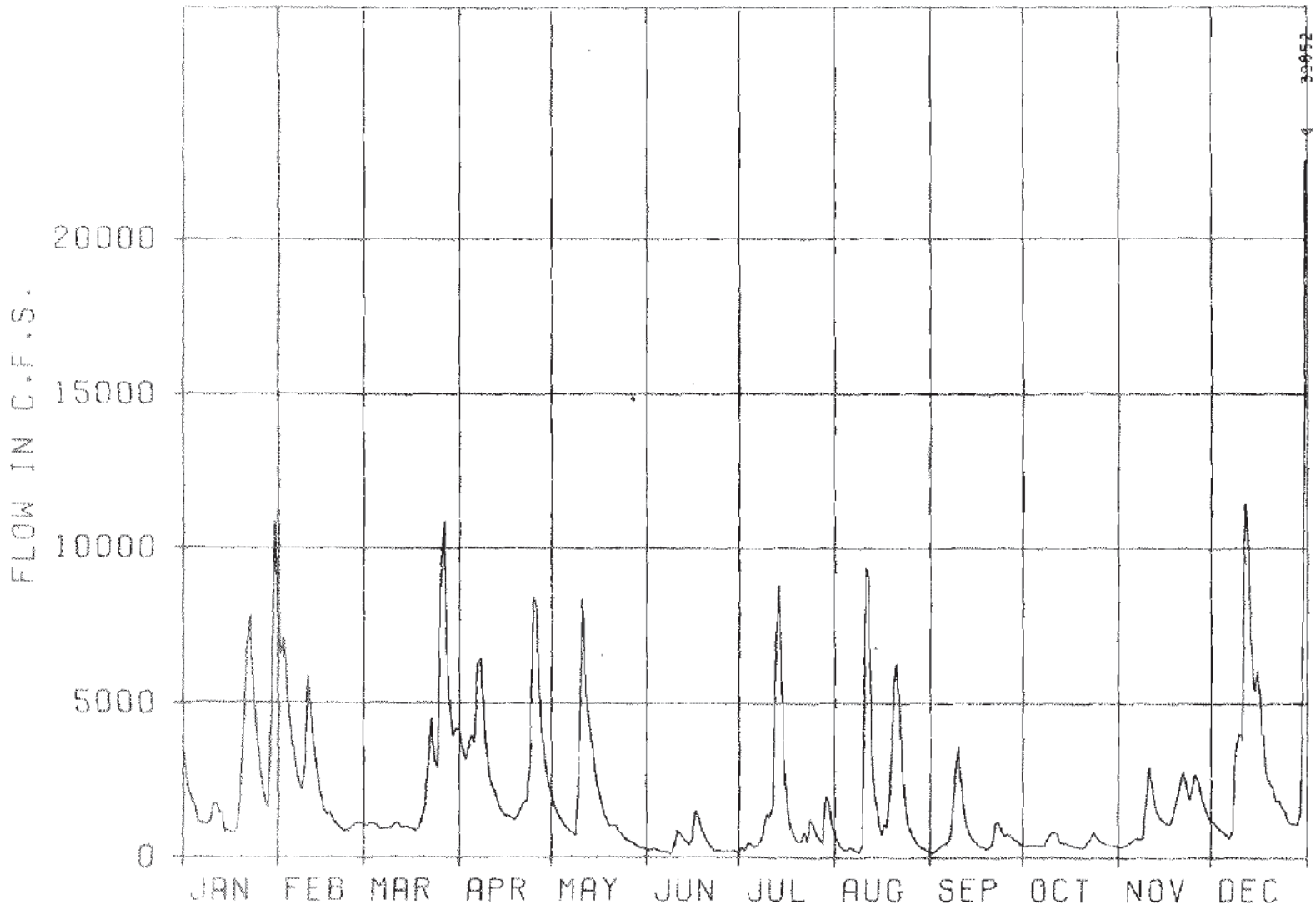


YEAR 1968

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-64

TYGART RIVER AT DAMSITE

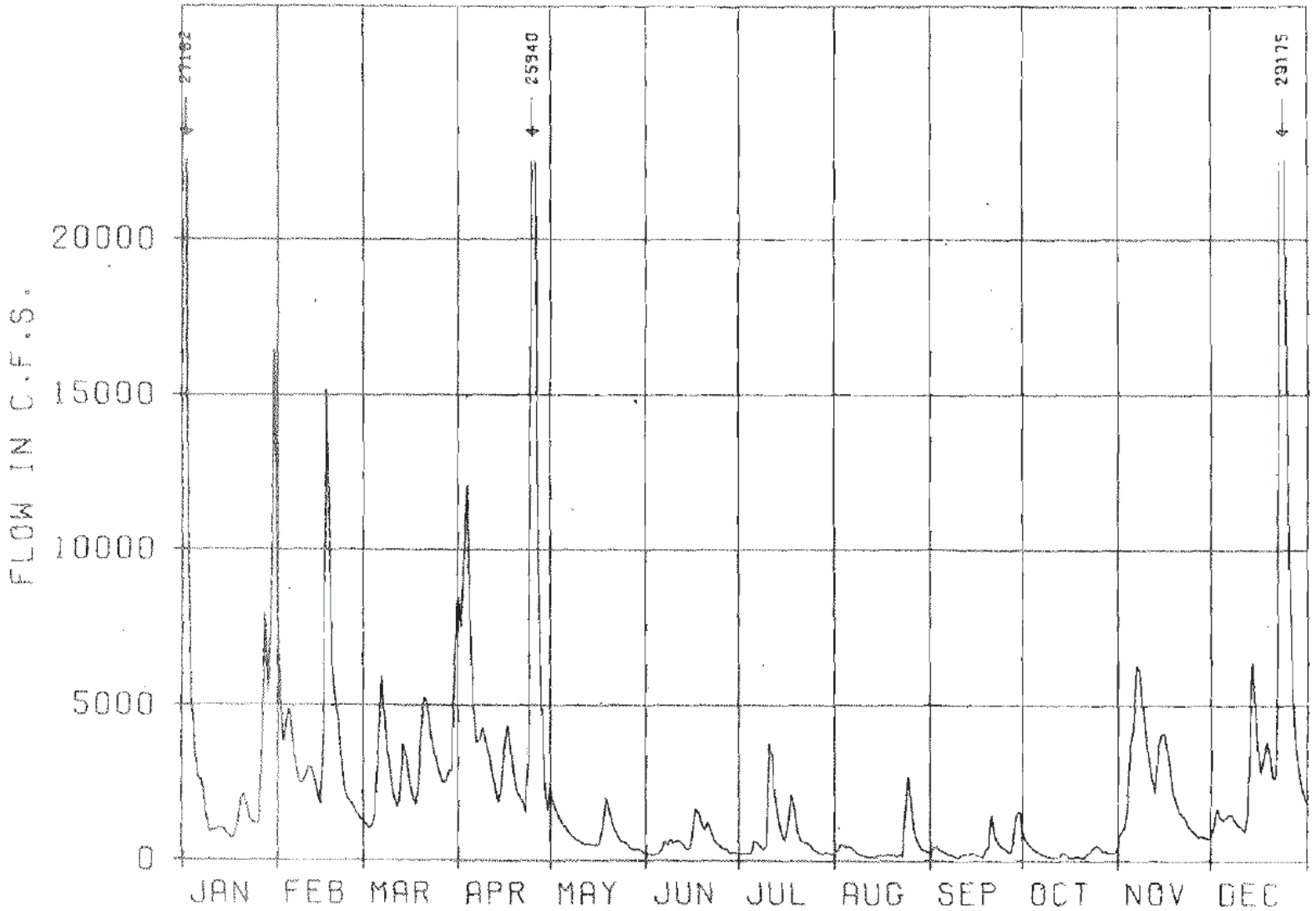


YEAR 1969

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-62

TYGART RIVER AT DAMSITE

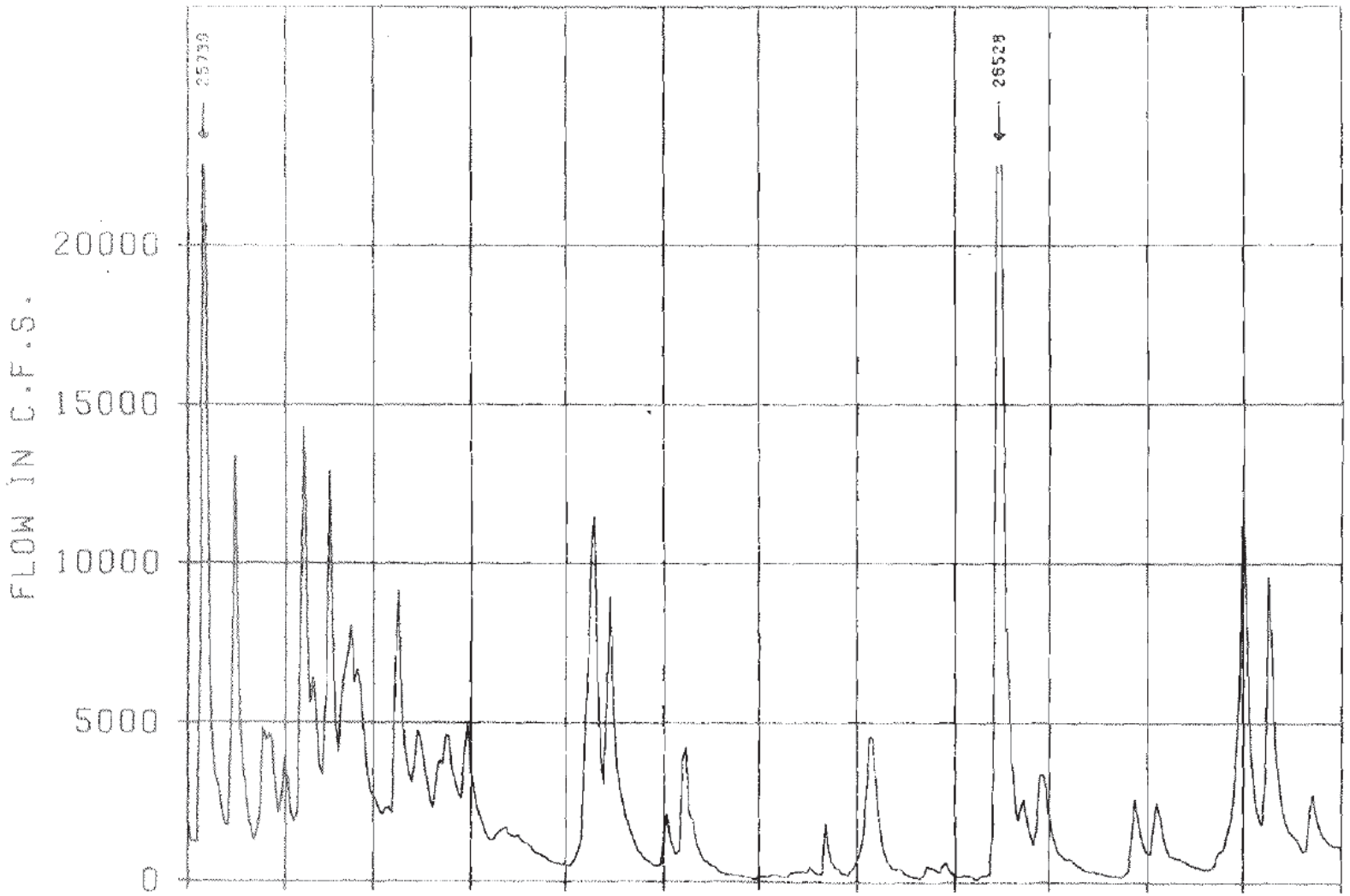


YEAR 1970

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-63

TYGART RIVER AT DAMSITE

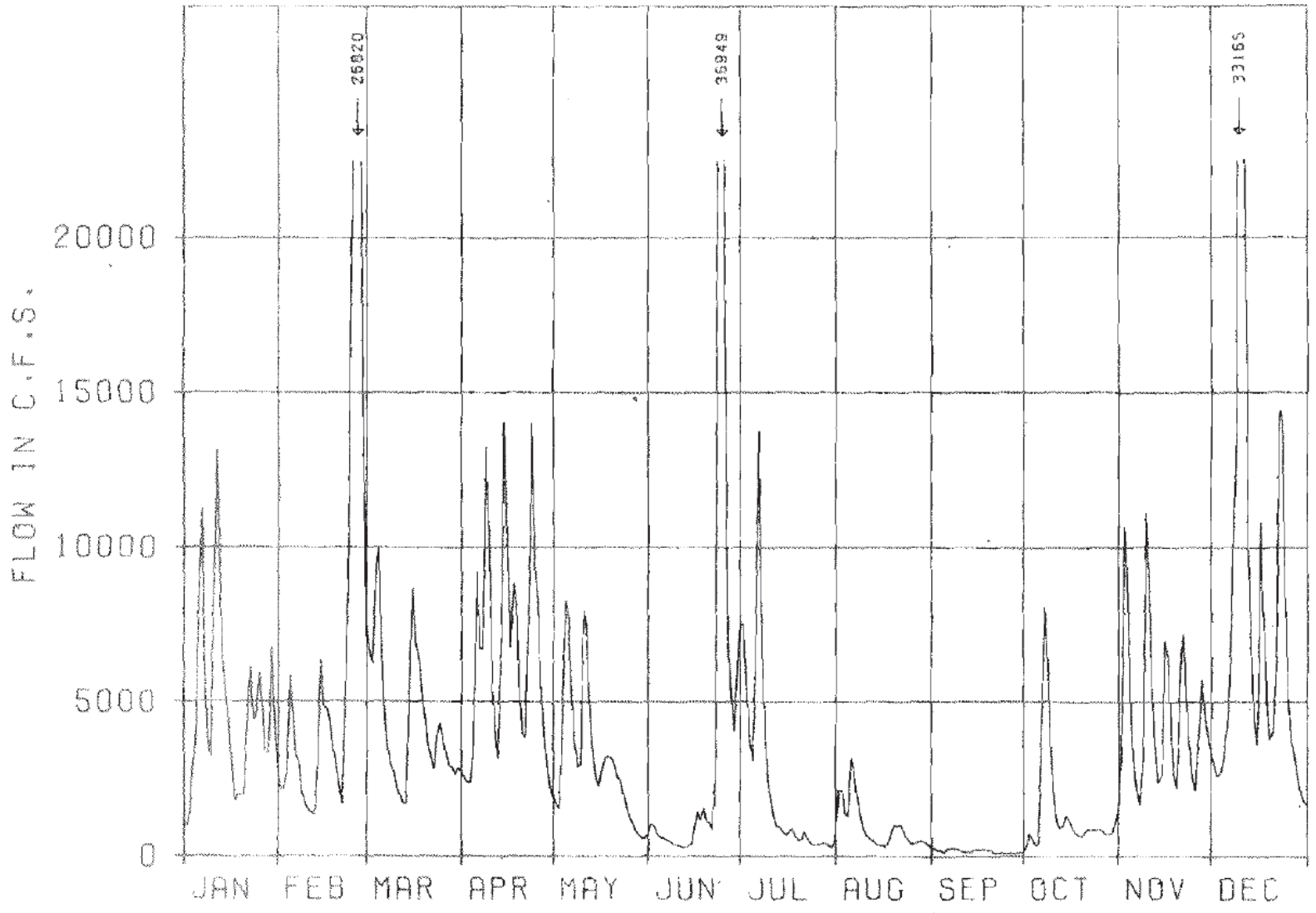


YEAR 1971

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-94

TYGART RIVER AT DAMSITE

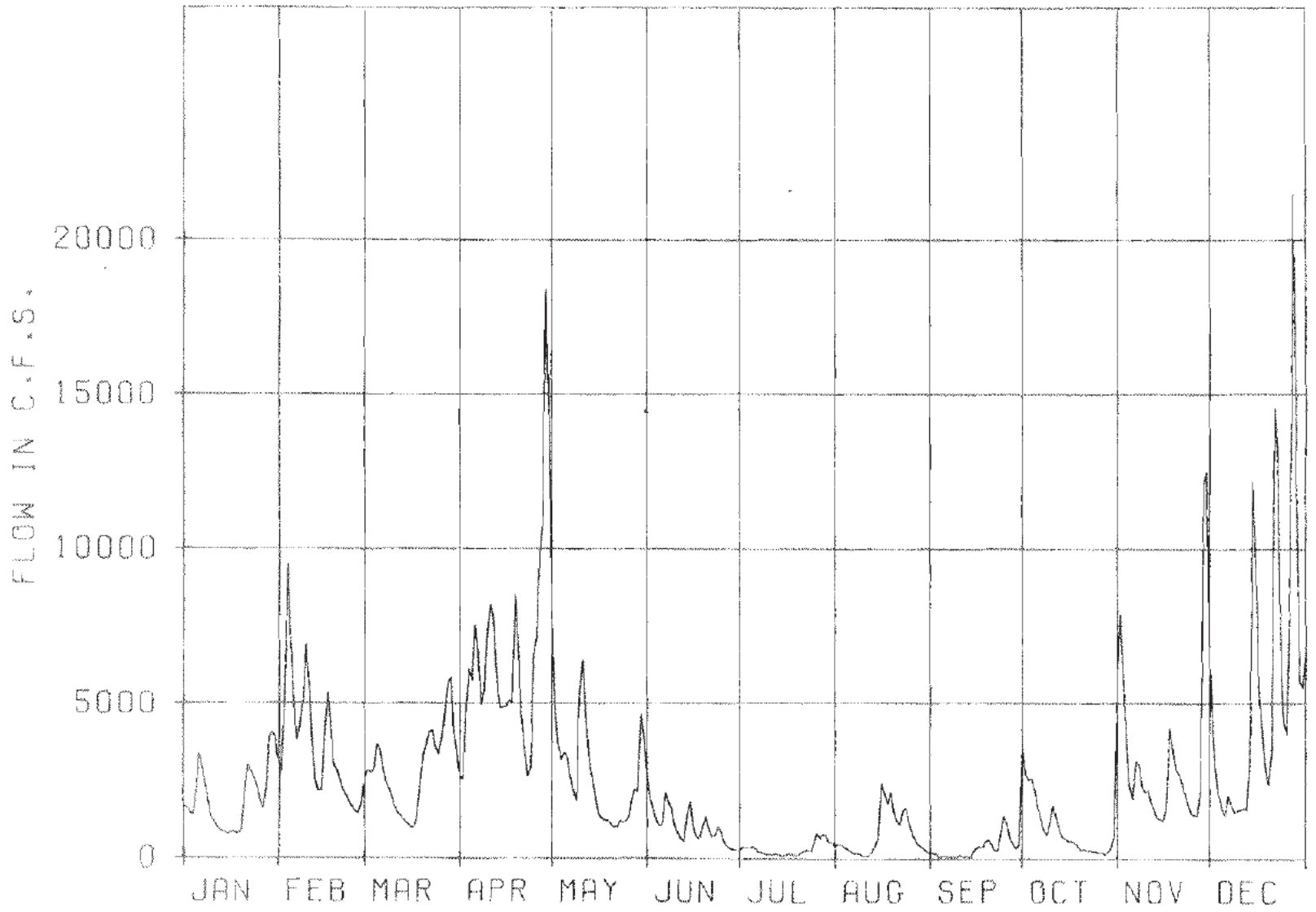


YEAR 1972

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-65

TYGART RIVER AT DAMSITE

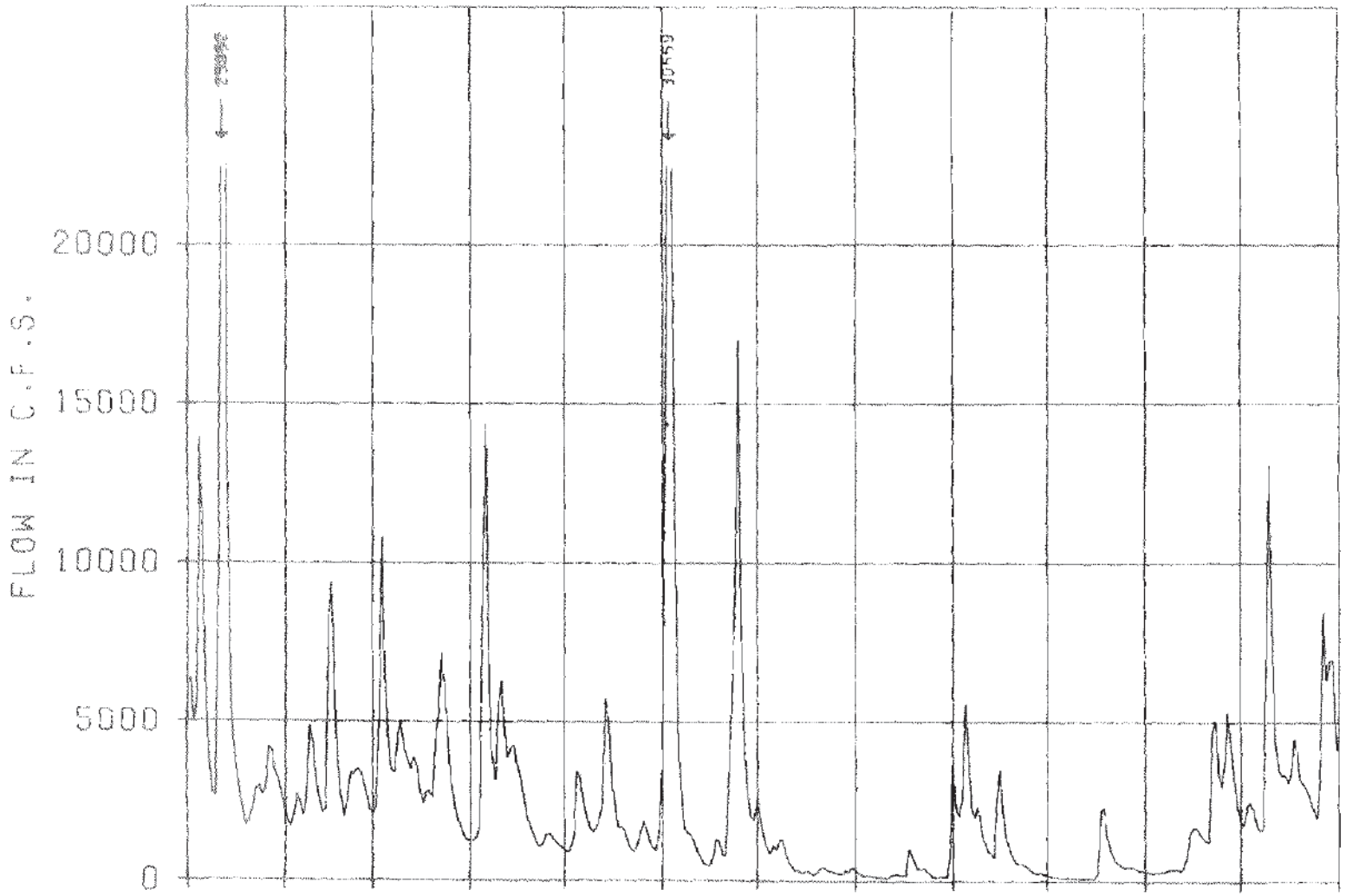


YEAR 1973

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
14 NOV 74

PLATE 23-66

TYGART RIVER AT DAMSITE

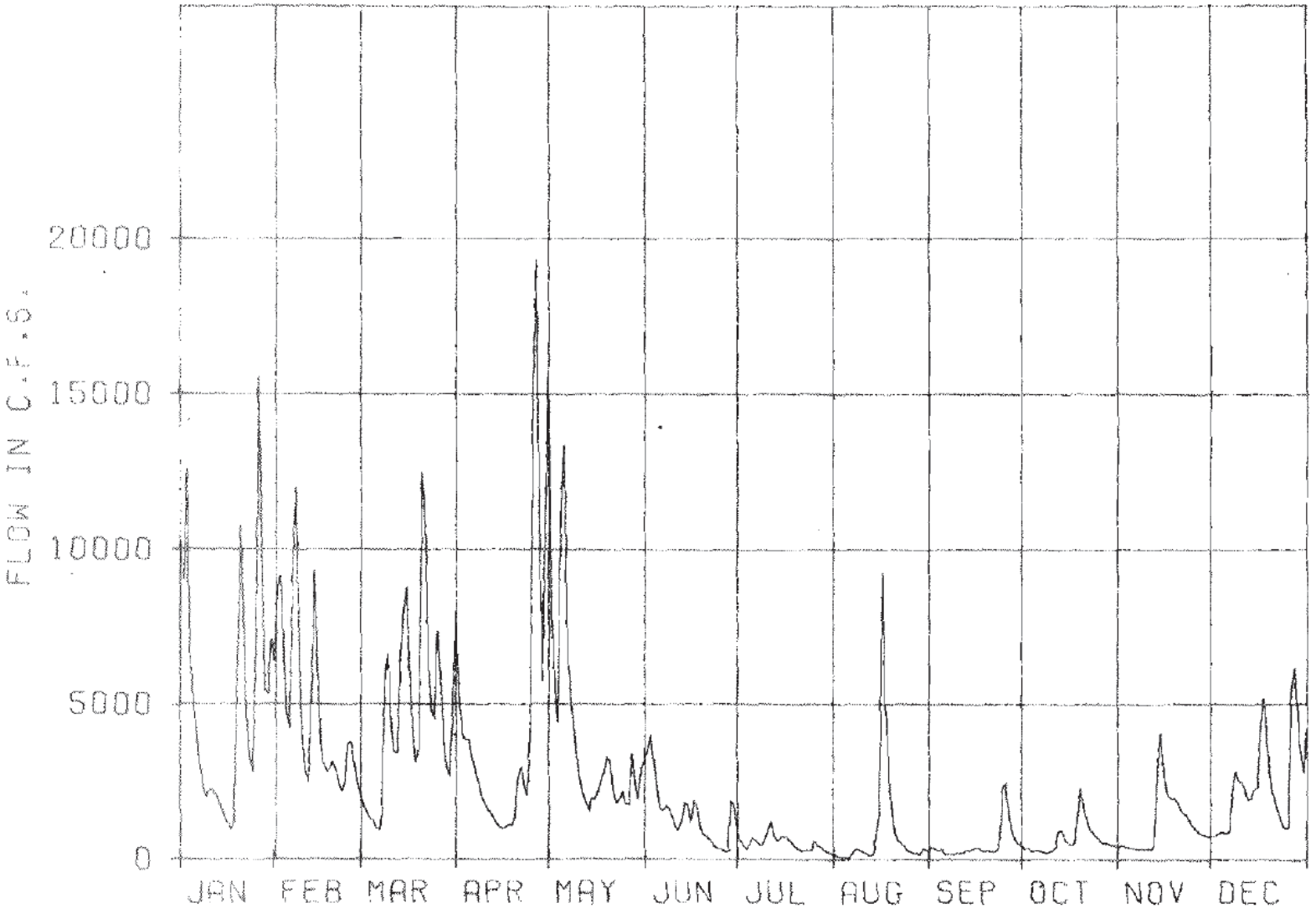


YEAR 1974

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
2[illegible] JUL 75

PLATE 23-67

TYGART RIVER AT DAMSITE



YEAR 1975

U.S. ARMY ENGINEER DISTRICT
PITTSBURGH
28 JUL 76

PLATE 23-68

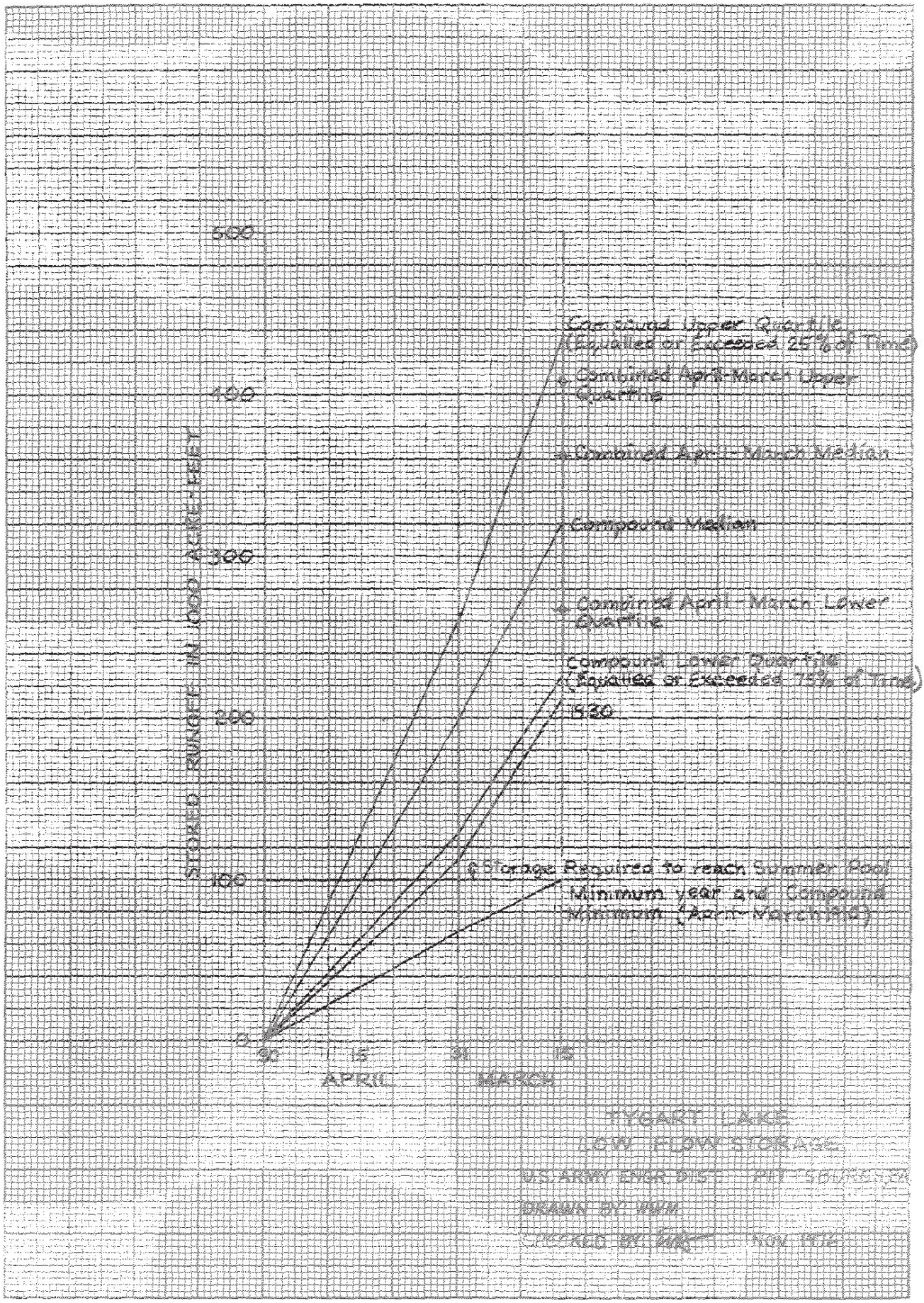

500
400
300
200
100
0
STORED RUNOFF IN 1000 ACRE-FEET
Computed Upper Quartile
(Equalled or Exceeded 25% of Time)
Combined April-March Upper Quartile
Combined April-March Median
Compound Median
Combined April-March Lower Quartile
Compound Lower Quartile
(Equalled or Exceeded 75% of Time)
1930
Storage Required to reach Summer Pool
Minimum year and Compound Minimum (April-March Inflow)
30
15
APRIL
MARCH
15
TYGART LAKE
LOW FLOW STORAGE
U.S. ARMY ENGR DIST. PITTSBURGH
DRAWN BY WWM
CHECKED BY
NOV 1961

PLATE 24

STAGE IN FEET
DISCHARGE IN 1000 CFS
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TYGART RIVER AT PHILIPPI, W.VA.
STAGE DISCHARGE RELATION
U.S. ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY: CFP
CHECKED BY:
NOV 1974

PLATE 25

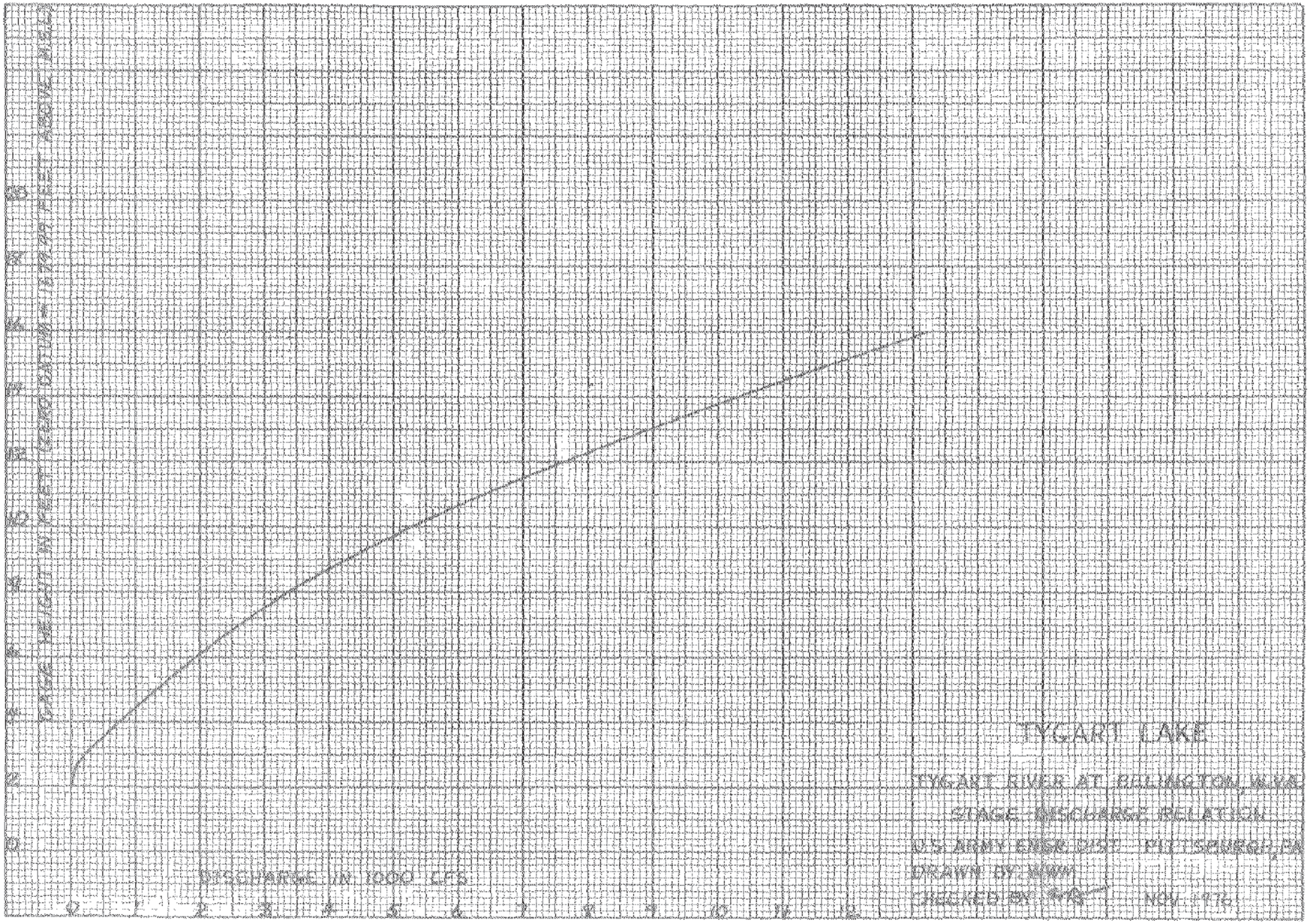

TYGART LAKE
TYGART RIVER AT PHILIPPI(?), W.VA.
STAGE DISCHARGE RELATION
U.S. ARMY ENGR. DIST. PITTSBURGH, PA
DRAWN BY
CHECKED BY
NOV. 1976
DISCHARGE IN 1000 CFS
0
1
2
3
4
5
6
7
8
9
10
11
12

PLATE 26

TYGART LAKE
TYGART RIVER AT ELKINS, W.VA.
(CHANNEL GAGE)
STAGE-DISCHARGE RELATION
DISCHARGE IN 1000 CFS
STAGE IN FEET ABOVE GAGE DATUM

PLATE 27

TYGART LAKE
TYGART RIVER AT DAILEY, W.VA.
STAGE - DISCHARGE RELATION
U.S. ARMY ENGR. DIST. PITTSBURGH, PA
DRAWN BY WWM
CHECKED BY
NOV. 1976
STAGE IN FEET ABOVE NORMAL POOL ELEVATION
DISCHARGE IN 1000 CFS
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40

PLATE 28

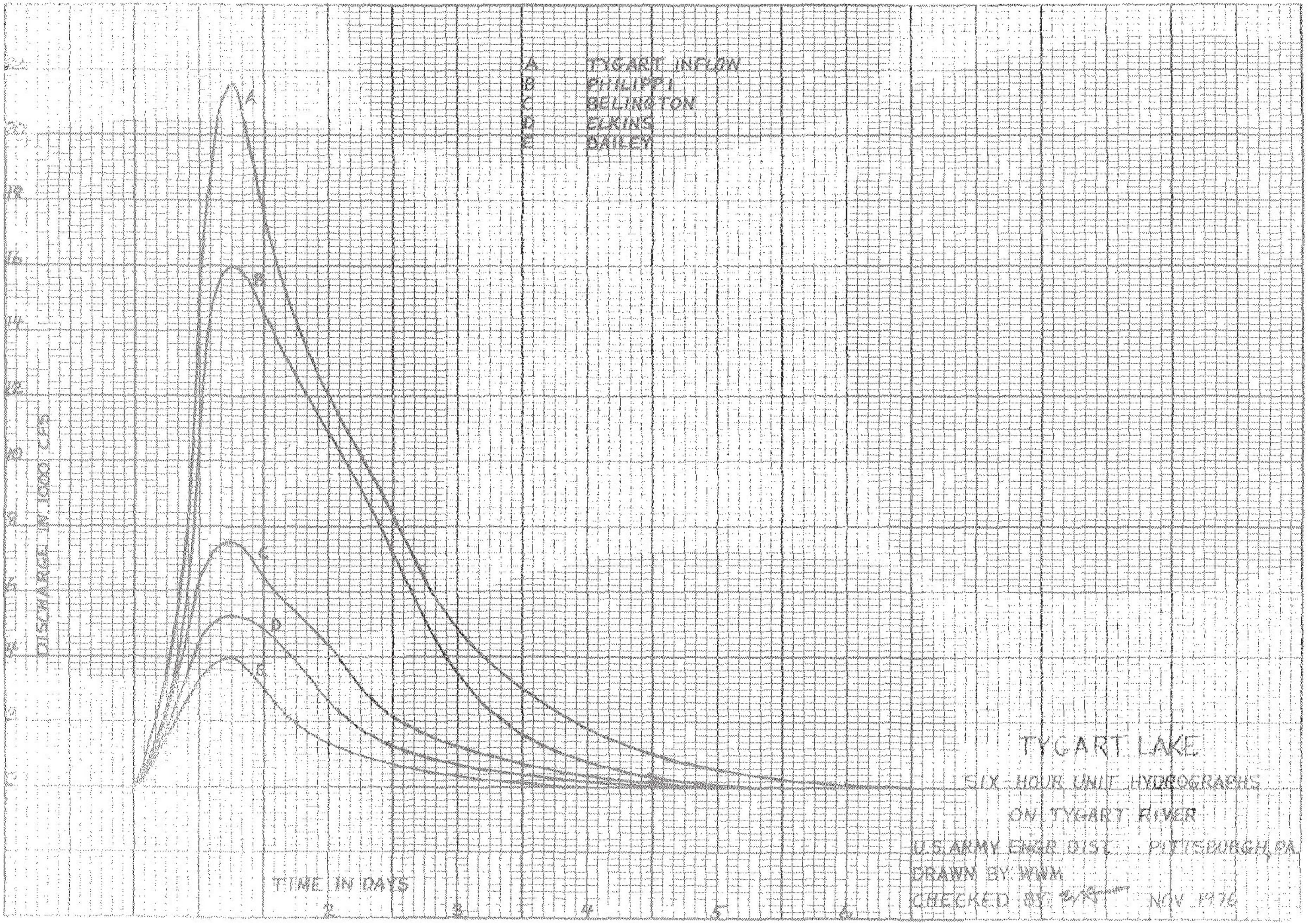

A TYGART INFLOW
B PHILIPPI
C BELINGTON
D ELKINS
E BAILEY
DISCHARGE IN 1000 CFS
TIME IN DAYS
2
3
4
5
6
TYGART LAKE
SIX HOUR UNIT HYDROGRAPHS
ON TYGART RIVER
U.S.ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY WWM
CHECKED BY
NOV 1976

PLATE 29

RESERVOIR POOL ELEVATION - MSL
1160
1140
1120
1100
1080
POOL ELEVATION
INFLOW
OUTFLOW
DISCHARGE IN 1000 CFS
0
10
20
30
40
50
60
70
80
90
JULY 1912
17
18
19
20
21
22
23
24
25
26
27
28
TOTAL RAINFALL FOR PERIOD = 6.52 IN.
" RUNOFF " " = 3.77 IN.
" LOSSES " " = 2.75 IN.
TYGART LAKE
JULY 1912 FLOOD
THEORETICAL RESERVOIR OPERATIONS
U.S. ARMY ENGR. DIST. PITTSBURGH, PA.
DRAWN BY: WWM
CHECKED BY: CVP
NOV 1976

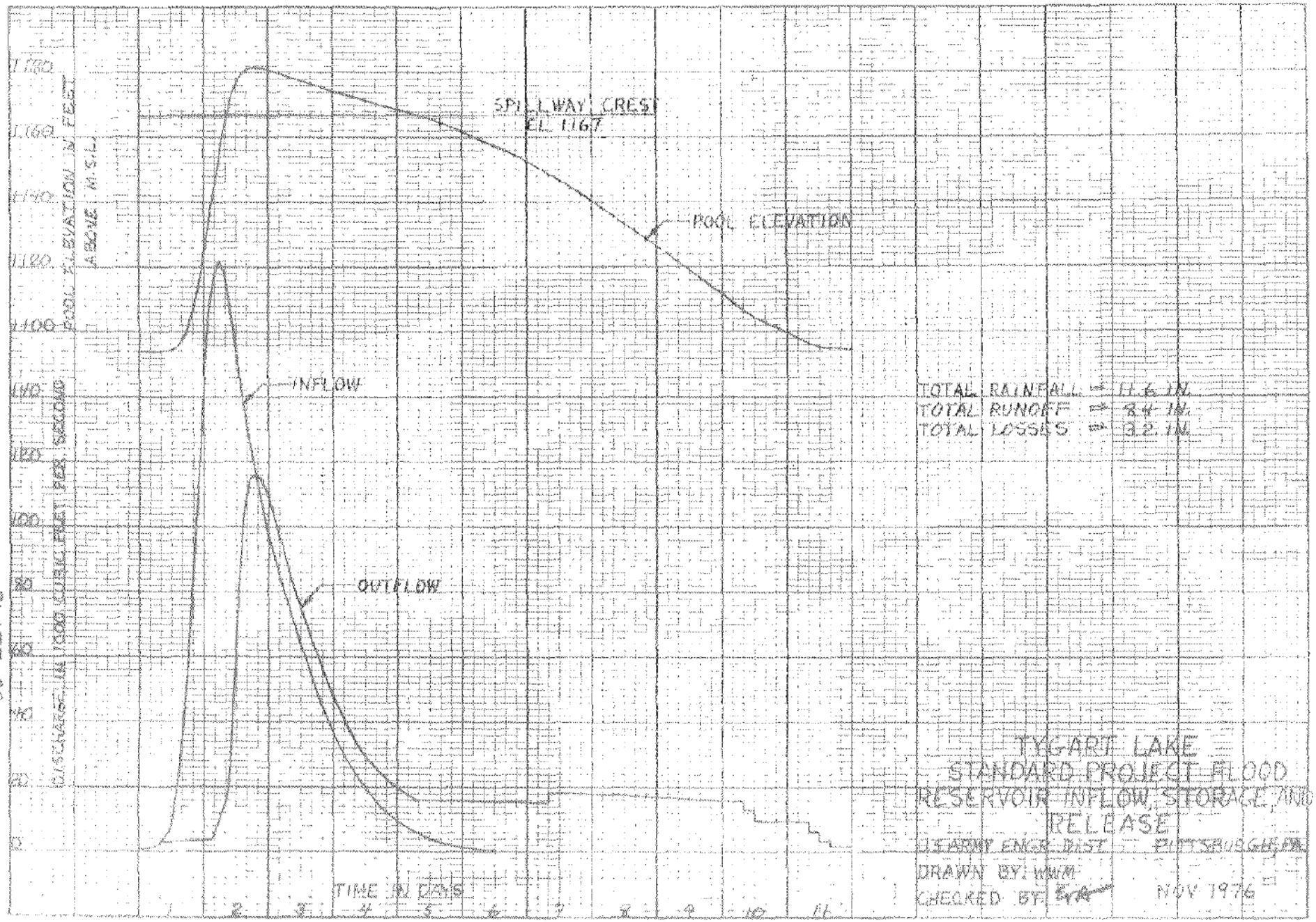
PLATE 30

DISCHARGE IN 1000 CFS
RESERVOIR POOL ELEV. MSL
POOL ELEVATION
INFLOW
OUTFLOW
1160
1140
1120
1100
1080
60
40
20
0
OCTOBER 1937
NOVEMBER
21
28
29
30
31
1
2
3
4
5
TOTAL RAINFALL FOR PERIOD = 9.87 IN.
" RUNOFF " " = 3.50 IN.
" LOSSES " " = 6.37 IN.
TYGART LAKE
OCTOBER 1937 FLOOD
THEORETICAL RESERVOIR OPERATIONS
U.S. ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY: WWA
CHECKED BY: E.M.
NOV. 1976

PLATE 31

1190
1180
1170
1160
1150
1140
1130
1120
1110
1100
1090
"TRUE" ELEVATION ABOVE MSL
SUMMER POOL ELEV. 1094
FULL POOL ELEV. 1167
100
100%
RECURRENCE INTERVAL IN YEARS
TYGART LAKE
STORAGE FREQUENCY
U.S. ARMY ENGR. DIST. PITTSBURGH
DRAWN BY WWM
CHECKED BY
NOV 1976

PLATE 32



TYGART LAKE
STANDARD PROJECT FLOOD
RESERVOIR INFLOW, STORAGE AND RELEASE

DEPARTMENT OF THE ARMY — PITTSBURGH DISTRICT — CORPS OF ENGINEERS
DRAWN BY: WWM
CHECKED BY: EVK
NOV 1976

PLATE 33

DISCHARGE IN 1,000 CUBIC FEET PER SECOND
POOL ELEVATION IN FEET ABOVE M.S.L.
SPILLWAY CREST EL. 1167
POOL ELEVATION
INFLOW
OUTFLOW
TIME IN DAYS
TOTAL RAINFALL = 20.5 IN.
TOTAL RUNOFF = 17.3 IN.
TOTAL LOSSES = 3.2 IN.
TYGART LAKE
SPILLWAY DESIGN FLOOD
RESERVOIR INFLOW, STORAGE, AND RELEASE
U.S. ARMY ENGINEER DIST. PITTSBURGH, PA
DRAWN BY: WVM
CHECKED BY: [illegible]
NOV. 1976

PLATE 34

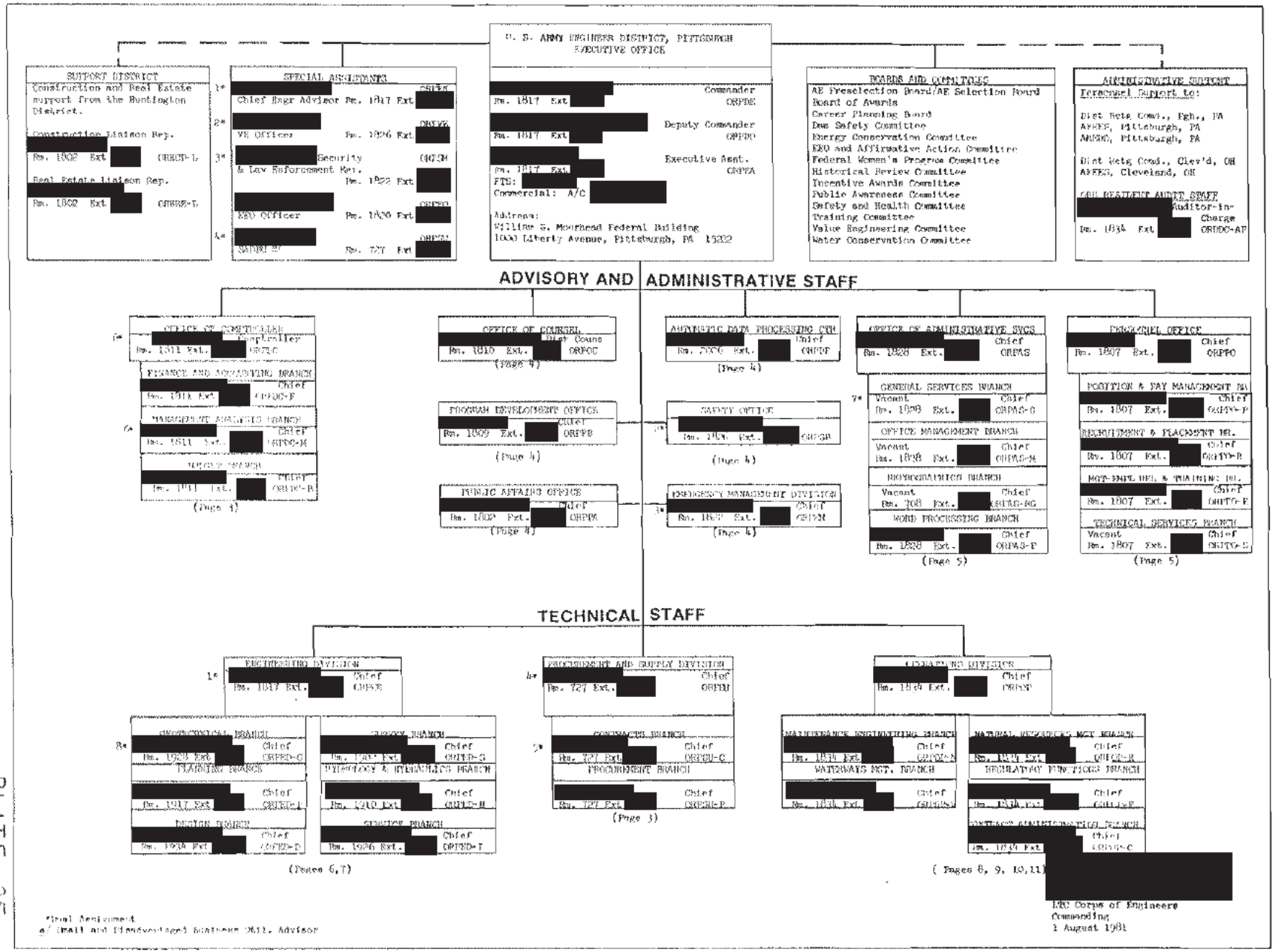

U. S. ARMY ENGINEER DISTRICT, PITTSBURGH
EXECUTIVE OFFICE
Commander
ORPDE
Deputy Commander
ORPDO
Executive Asst.
ORPEA
FTS:
Commercial: A/C
Address:
William S. Moorhead Federal Building
1000 Liberty Avenue, Pittsburgh, PA 15222
SUPPORT DISTRICT
Construction and Real Estate support from the Huntington District.
Construction Liaison Rep.
Rm. 1002 Ext. ORHCH-L
Real Estate Liaison Rep.
Rm. 1002 Ext. ORHRE-L
SPECIAL ASSISTANTS
Chief Engr Advisor Rm. 1817 Ext. ORDES
VE Officer Rm. 1826 Ext. ORDVE
Security & Law Enforcement Mgr. Rm. 1822 Ext. ORDSO
EEO Officer Rm. 1820 Ext. ORDEO
SAVANNAH AV Rm. 727 Ext. ORPEU
BOARDS AND COMMITTEES
AE Preselection Board/AE Selection Board
Board of Awards
Career Planning Board
Dam Safety Committee
Energy Conservation Committee
EEO and Affirmative Action Committee
Federal Women's Program Committee
Historical Review Committee
Incentive Awards Committee
Public Awareness Committee
Safety and Health Committee
Training Committee
Value Engineering Committee
Water Conservation Committee
ADMINISTRATIVE SUPPORT
Personnel Support to:
Dist Hdtq Comd., Pgh., PA
AFEES, Pittsburgh, PA
AMMRC, Pittsburgh, PA
Dist Hdtq Comd., Clev'd, OH
AFEES, Cleveland, OH
FOU RESIDENT AUDIT STAFF
Auditor-in-Charge
Rm. 1034 Ext. ORHDC-AF
ADVISORY AND ADMINISTRATIVE STAFF
OFFICE OF COMPTROLLER
Comptroller
Rm. 1311 Ext. ORPCO
FINANCE AND ACCOUNTING BRANCH
Chief
Rm. 1311 Ext. ORPDC-F
MANAGEMENT ANALYSIS BRANCH
Chief
Rm. 1311 Ext. ORPDC-M
(Page 4)
OFFICE OF COUNSEL
Chief Counsel
Rm. 1810 Ext. ORPOC
(Page 4)
PROGRAM DEVELOPMENT OFFICE
Chief
Rm. 1009 Ext. ORPPB
(Page 4)
PUBLIC AFFAIRS OFFICE
Chief
Rm. 1002 Ext. ORPPA
(Page 4)
AUTOMATIC DATA PROCESSING CTR
Chief
Rm. 7000 Ext. ORPDP
(Page 4)
SAFETY OFFICE
Rm. 1004 Ext. ORPSH
(Page 4)
EMERGENCY MANAGEMENT DIVISION
Chief
Rm. 1807 Ext. ORPEM
(Page 4)
OFFICE OF ADMINISTRATIVE SVCS
Chief
Rm. 1828 Ext. ORPAS
GENERAL SERVICES BRANCH
Vacant
Chief
Rm. 1828 Ext. ORPAS-G
OFFICE MANAGEMENT BRANCH
Vacant
Chief
Rm. 1828 Ext. ORPAS-M
REPRODUCTION BRANCH
Vacant
Chief
Rm. 308 Ext. ORPAS-RG
WORD PROCESSING BRANCH
Chief
Rm. 1828 Ext. ORPAS-P
(Page 5)
PERSONNEL OFFICE
Chief
Rm. 1807 Ext. ORPPO
POSITION & PAY MANAGEMENT BR
Chief
Rm. 1807 Ext. ORPPO-P
RECRUITMENT & PLACEMENT BR.
Chief
Rm. 1807 Ext. ORPPO-R
MGT-EMPL REL & TRAINING BR.
Chief
Rm. 1807 Ext. ORPTO-P
TECHNICAL SERVICES BRANCH
Vacant
Chief
Rm. 1807 Ext. ORPTO-S
(Page 5)
TECHNICAL STAFF
ENGINEERING DIVISION
Chief
Rm. 1017 Ext. ORPEN
CONSTRUCTION BRANCH
Chief
Rm. 1028 Ext. ORPED-C
TECHNICAL BRANCH
Chief
Rm. 1017 Ext. ORPED-T
DESIGN BRANCH
Chief
Rm. 1004 Ext. ORPED-D
CONSTRUCTION BRANCH
Chief
Rm. 1007 Ext. ORPED-C
HYDROLOGY & HYDRAULICS BRANCH
Chief
Rm. 1010 Ext. ORPED-H
GEOTECH BRANCH
Chief
Rm. 1026 Ext. ORPED-T
(Pages 6,7)
PROCUREMENT AND SUPPLY DIVISION
Chief
Rm. 727 Ext. ORPEU
CONTRACTS BRANCH
Chief
Rm. 727 Ext. ORPEU-C
PROCUREMENT BRANCH
Chief
Rm. 727 Ext. ORPEU-P
(Page 3)
OPERATIONS DIVISION
Chief
Rm. 1014 Ext. ORPOP
MAINTENANCE ENGINEERING BRANCH
Chief
Rm. 1834 Ext. ORPOM-M
WATERWAYS MGT. BRANCH
Chief
Rm. 1834 Ext. ORPOM-W
NATURAL RESOURCES MGT BRANCH
Chief
Rm. 1834 Ext. ORPOC-R
REGULATORY FUNCTIONS BRANCH
Chief
Rm. 1834 Ext. ORPOC-E
CONTRACT ADMINISTRATION BRANCH
Chief
Rm. 1834 Ext. ORPOC-C
(Pages 8, 9, 10, 11)
LTC Corps of Engineers
Commanding
1 August 1981
1* Civil Assistant
2* Small and Disadvantaged Business Util. Advisor

PLATE 35

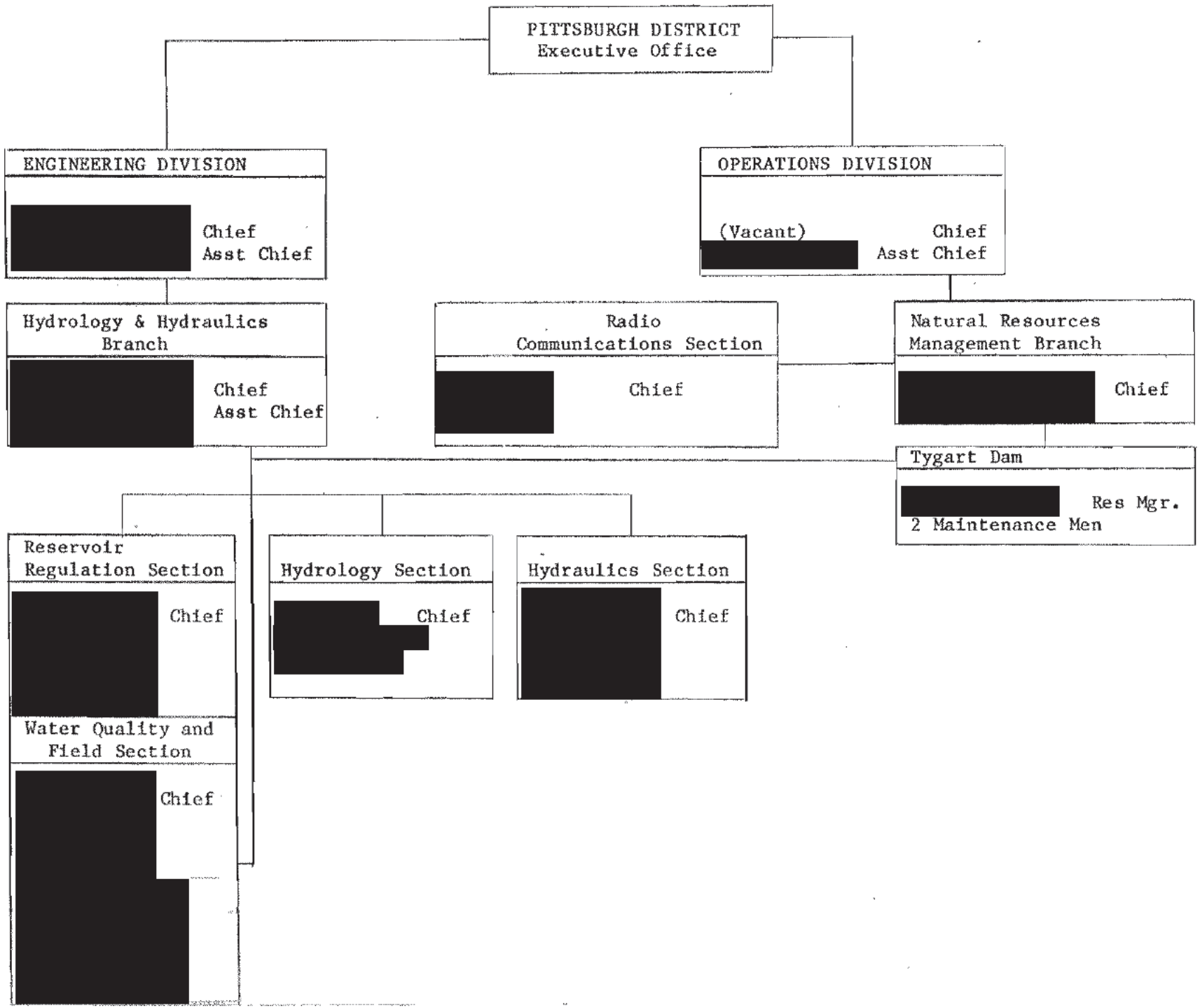
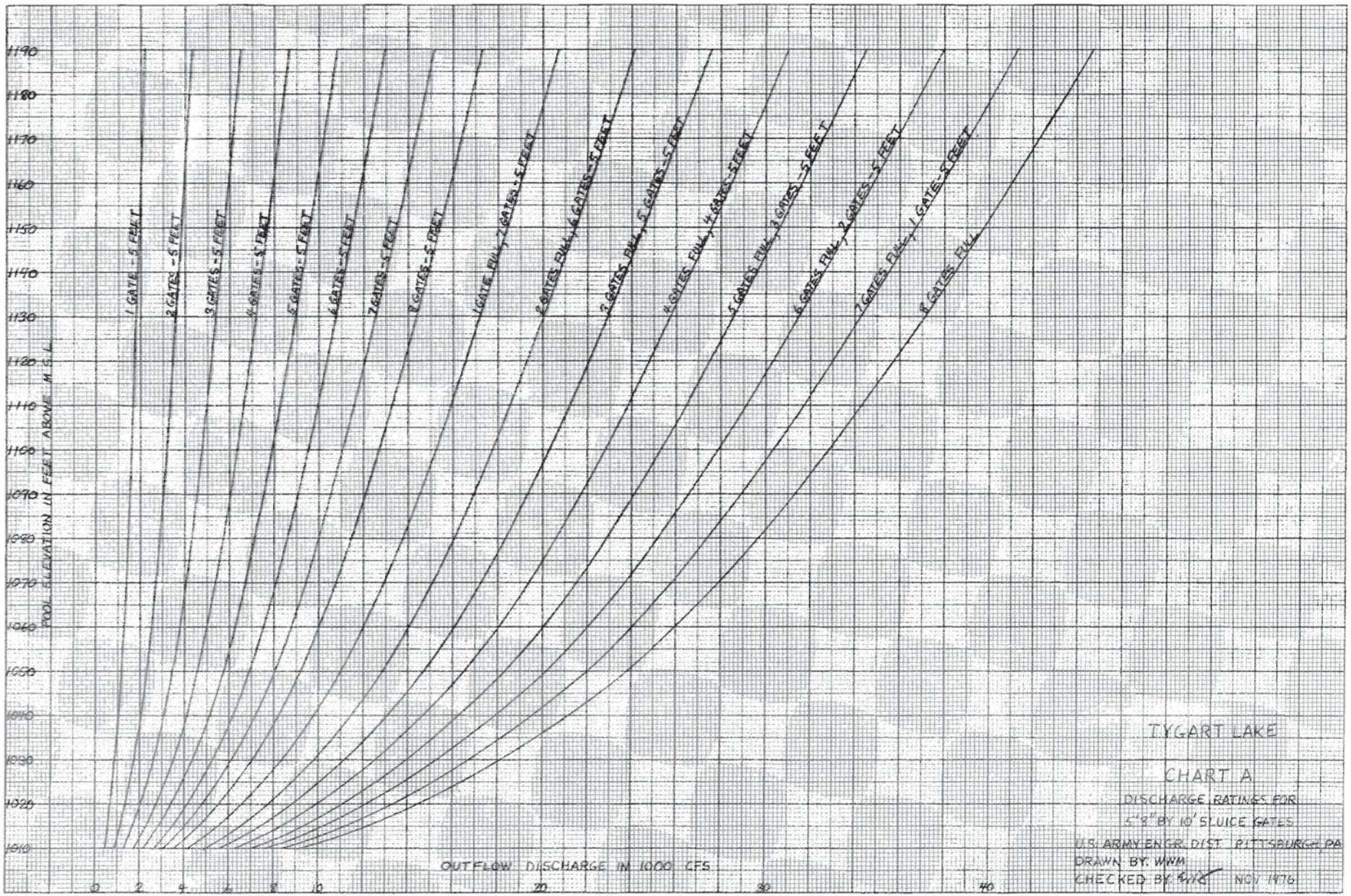

PITTSBURGH DISTRICT
Executive Office
ENGINEERING DIVISION
[redacted]
Chief
Asst Chief
OPERATIONS DIVISION
(Vacant)
Chief
[redacted]
Asst Chief
Hydrology & Hydraulics
Branch
[redacted]
Chief
Asst Chief
Radio
Communications Section
[redacted]
Chief
Natural Resources
Management Branch
[redacted]
Chief
Tygart Dam
[redacted]
Res Mgr.
2 Maintenance Men
Reservoir
Regulation Section
[redacted]
Chief
Hydrology Section
[redacted]
Chief
Hydraulics Section
[redacted]
Chief
Water Quality and
Field Section
[redacted]
Chief

PLATE 36



TYGART LAKE

CHART A

DISCHARGE RATINGS FOR
5'-3" BY 10' SLUICE GATES

U.S. ARMY ENGR. DIST. PITTSBURGH PA
DRAWN BY: WWM
CHECKED BY: [illegible] NOV 1976

PLATE 37

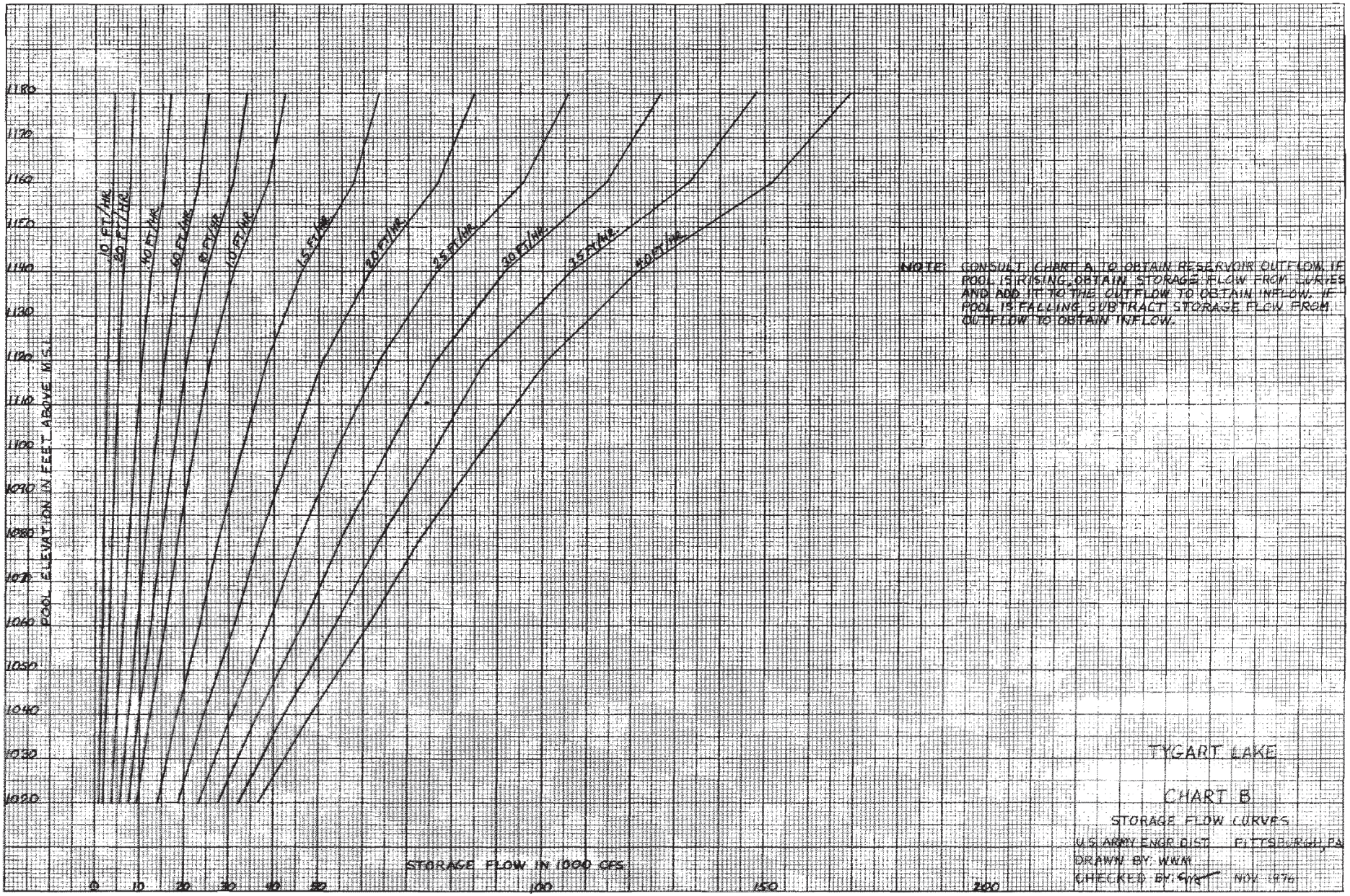

POOL ELEVATION IN FEET ABOVE M.S.L.
1180
1170
1160
1150
1140
1130
1120
1110
1100
1090
1080
1070
1060
1050
1040
1030
1020
10 FT/HR.
20 FT/HR.
30 FT/HR.
40 FT/HR.
60 FT/HR.
80 FT/HR.
100 FT/HR.
150 FT/HR.
200 FT/HR.
250 FT/HR.
300 FT/HR.
350 FT/HR.
400 FT/HR.
STORAGE FLOW IN 1000 CFS.
0
10
20
30
40
50
100
150
200
NOTE: CONSULT CHART A TO OBTAIN RESERVOIR OUTFLOW. IF POOL IS RISING, OBTAIN STORAGE FLOW FROM CURVES AND ADD IT TO THE OUTFLOW TO OBTAIN INFLOW. IF POOL IS FALLING, SUBTRACT STORAGE FLOW FROM OUTFLOW TO OBTAIN INFLOW.
TYGART LAKE
CHART B
STORAGE FLOW CURVES
U.S. ARMY ENGR DIST. PITTSBURGH, PA.
DRAWN BY: WWM
CHECKED BY:
NOV. 1976

PLATE 38

REGULATION DUTIES

BE ALERT!

OBSERVE THE WEATHER - WATCH THE POOL LEVEL
OBTAIN STREAM & RAIN DATA - CHECK OUTLETS
KNOW THE CONTROLS - CONTACT PITTSBURGH

SPECIAL

EMERGENCY SCHEDULE

(SEE PAGE 9 OF PROJECT SUPERVISOR'S MANUAL FOR LESS CRITICAL CONDITIONS)

CONTROLS		1	2	3
A	POOL	1094	1140	1160
	MINIMUM HOURLY RISE	2.0'	1.0'	RISING

B CARR CHINA STAGE BELOW 16.7 FEET

C NO ORDERS FROM PITTSBURGH FOR CONDITIONS

DUTIES:

(1) WITH CONTROL A(1,2,OR 3) AND C OBTAIN GAGE READINGS FOR ELKINS, BUCKHANNON, BELINGTON, AND PHILIPPI, SPECIAL RAINFALL REPORTS, AND HOURLY POOL READINGS.

(2) CONTACT PITTSBURGH.

IF NO CONTACT CAN BE MADE WITH PITTSBURGH WITHIN TWO HOURS AFTER DUTY (1) IS PERFORMED, USE RADIO ON THE HOUR AND CONTINUE TO CHECK POOL HOURLY

(3) MAKE NO CHANGE IN GATES UNLESS CONTROL B EXISTS AND POOL IS FALLING.

(4) IF CONTROL B EXISTS, CONSULT EMERGENCY REGULATION SCHEDULE ON PAGE 9 OF PROJECT SUPERVISOR'S MANUAL. OUTFLOW STAGE SHOULD BE KEPT AT OR SLIGHTLY BELOW 16.7 FEET UNTIL POOL FALLS TO WITHIN 30 FEET OF ITS PRE-FLOOD ELEVATION.