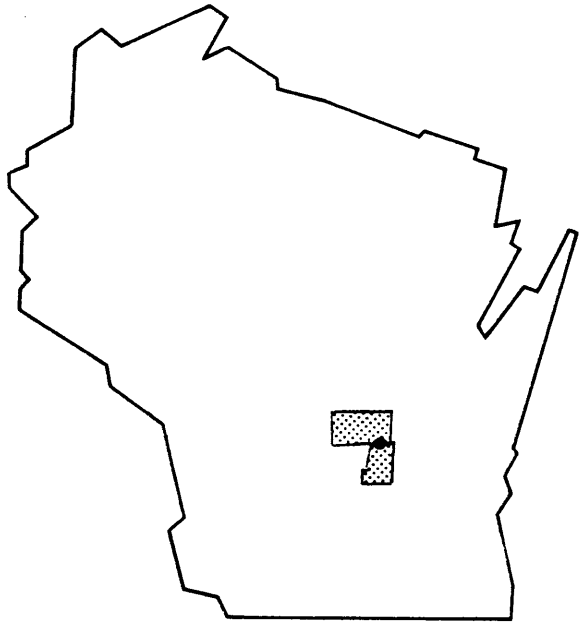
FLOOD INSURANCE STUDY



CITY OF BERLIN, WISCONSIN
GREEN LAKE AND WAUSHARA COUNTIES

SEPTEMBER 1977

U.S. DEPARTMENT of HOUSING & URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

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FLOOD INSURANCE STUDY

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the City of Berlin, Green Lake and Waushara Counties, Wisconsin, and to aid in the administration of the Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Berlin to the regular program of flood insurance by the Federal Insurance Administration. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

Identification of streams requiring detailed study was done in a meeting attended by personnel of the U.S. Army Corps of Engineers, the Federal Insurance Administration, and officials of the City of Berlin in January 1975.

A public meeting was held in July 1975 to inform local officials, as well as private residents and businessmen, of the areas being studied, the progress of the study, and the eventual ramifications of the study for insurance and flood plain management objectives.

The City of Berlin Planning Commission Coordinator was contacted for and supplied pertinent information and maps for this study.

The U.S. Geological Survey was contacted for and supplied flood marks and flow information (Reference 1).

During the course of the work by the U.S. Army Corps of Engineers, flood elevations, flood boundaries, and floodway delineations were reviewed with community officials and with officials of the State Department of Natural Resources. On May 12, 1976, the results of the work by the U.S. Army Corps of Engineers were reviewed at a final coordination meeting attended by personnel of the U.S. Army Corps of Engineers, and the Federal Insurance Administration, and residents and community officials of the City of Berlin. The results of the study were acceptable to all present.

1.3 Authority and Acknowledgments

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Army Corps of Engineers, Chicago District, under Inter-Agency Agreement Nos. H-16-75 and H-7-76, Project Order Nos. 20 and 1, respectively. This work, which was completed in April 1976, covered all flooding sources affecting the City of Berlin.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Berlin, Green Lake and Waushara Counties, Wisconsin. The area of study is shown on the Vicinity Map (Figure 1).

The stream segments studied in detail for this report include those portions of the Upper Fox River, Barnes Creek, and Winchell Springs Creek within the city's corporate limits. The areas studied in detail were chosen with consideration given to all forecasted development and proposed construction through 1980.

A small, unnamed tributary to Winchell Springs Creek was studied by approximate methods because no development is expected along it in the foreseeable future.

2.2 Community Description

The City of Berlin is primarily situated in the northeastern corner of Green Lake County, although a portion of the city extends into southeastern Waushara County. It is located along the Upper Fox River, approximately 30 miles upstream from the river's junction with Lake Winnebago at Oshkosh. The city currently has an incorporated area of 5.6 square miles.

In 1673, Jacques Marquette and Louis Jolliet were the first white men to visit the Mascoutin Indians who inhabited the area of present day Berlin. Later, in 1846, Nathan Strong led a party commissioned by the Federal Government to select a site for a bridge across the Fox River, which would provide access to the northern

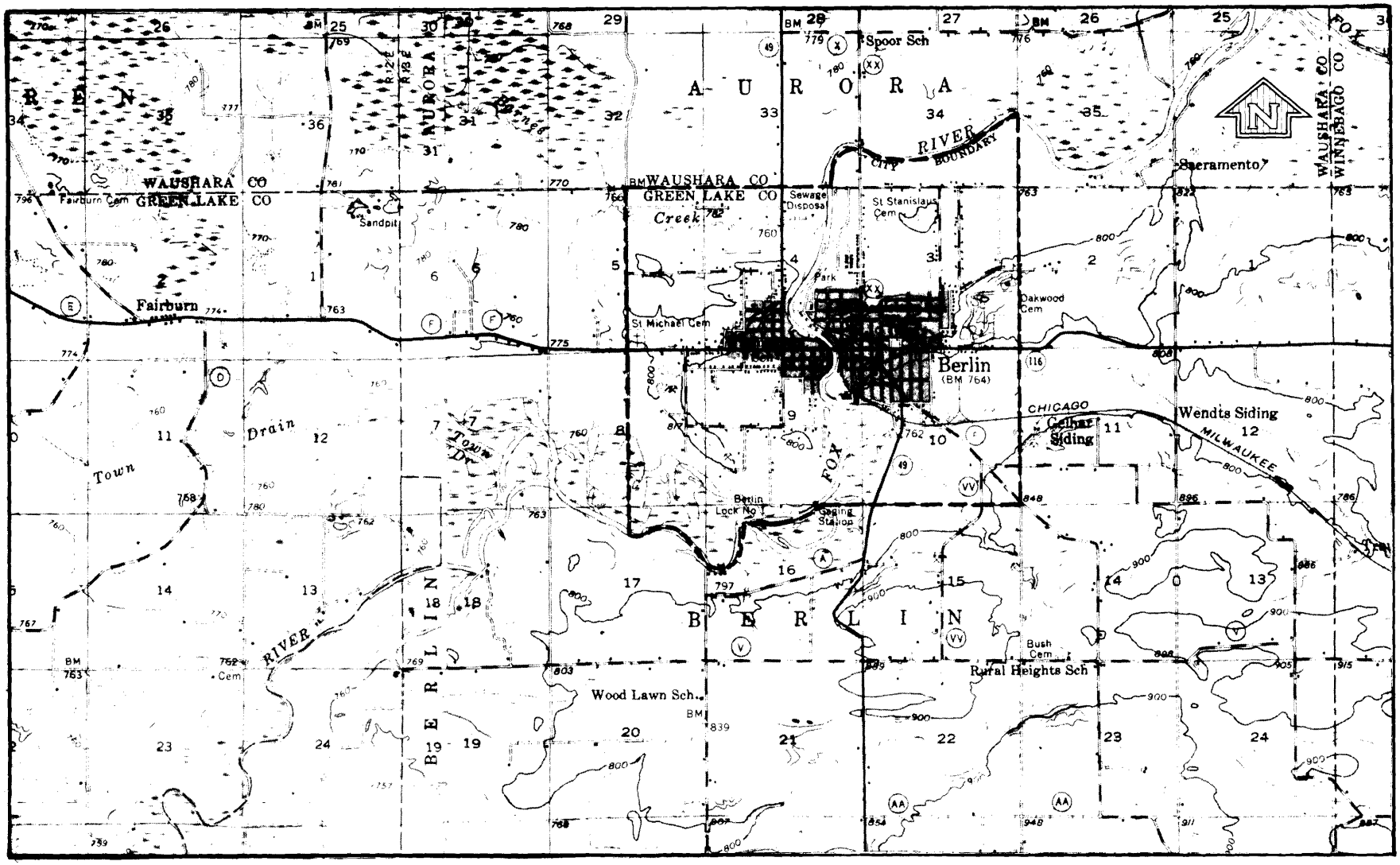

FIGURE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WAUSHARA COS.)

VICINITY MAP

timber land. Strong selected a site within the present city limits and founded it as Strong's Landing. Settlers of English descent came to the area in 1847, followed by immigrants from Germany and Poland. The original act incorporating the City of Berlin was approved in 1857.

The 1970 census lists the population of the city as 5338, an increase of 10.3 percent from the 1960 population of 4838. Current principal industries include tanning, textiles, houseboat building, leather products, fur products, and the manufacturing of foundry products and photographic and optical equipment. The city also provides excellent natural recreational facilities for boating, fishing, hunting, camping, and swimming.

Topography within the City of Berlin is varied. Large parts of the southern portion of the city, near the Fox River and Winchell Springs Creek, are flat and marshy. Most of the developed areas of the city lie on gently rolling slopes. The northern portion of the city, though virtually flat, is higher than the southern part of the city, and is therefore not marshy. Undeveloped land is covered with a mixture of trees and low-lying brush.

Average monthly temperatures for the Berlin area vary from 17.2°F in January to 69.2°F in August, resulting in an average annual temperature of 45.4°F (Reference 2). Average annual precipitation amounts to approximately 34 inches (Reference 3).

The Fox River, which has a total drainage area of 6430 square miles, rises in Columbia County in south-central Wisconsin, just east of Portage. The river then flows northeasterly through Lakes Buffalo, Apuckawa, Butte des Morts, Winnebago, and Little Lake Butte des Morts, eventually emptying into Green Bay. That portion of the river upstream of Lake Winnebago is referred to as the Upper Fox River, while that portion below Lake Winnebago is known as the Lower Fox River.

The Fox River played an important role in transportation until approximately 1890. Freight and passengers were carried by steamboat from Lake Winnebago to the Wisconsin River Canal at Portage. Excursion boats continued to use the river until 1920, when dredging was discontinued. The series of locks and dams along the Upper Fox River, including the Berlin lock and dam, are currently under the jurisdiction of the State of Wisconsin, which has abandoned their maintenance as navigation facilities.

The flood plain of the Fox River contains a mixture of open space, industrial, commercial, residential, and recreational land uses. The city has developed substantial strips of parklands along the river and has plans for more such areas. The flood plain of Winchell Springs Creek is primarily determined by the backwater levels at the various flow-restrictive bridges traversing the creek. Open space, industrial, residential, commercial, and agricultural land uses are included in areas which would be inundated by the 100-year flood of Winchell Springs Creek. The Barnes Creek flood plain consists primarily of undeveloped low-lying grasslands, although some residential properties are included. The City of Berlin has enacted regulations, as discussed in Section 2.4, to control the future development of these flood plains.

2.3 Principal Flood Problems

Although the majority of severe flooding along the Upper Fox River has occurred in the spring, floods have been recorded in all seasons of the year. These floods can occur entirely from rainfall, from rainfall accompanied with snowmelt, or from snowmelt alone.

The U.S. Geological Survey maintains a recording water-stage gage at Berlin, 1 mile upstream from the Huron Street bridge. Data collected from this gage and newspaper accounts provide the primary sources of information on flooding within Berlin. Records from this gage, which cover a period from 1898, indicate that the maximum recorded discharge for the Fox River at Berlin is 6900 cubic feet per second (cfs), and occurred on March 17 and 18, 1946 (Reference 1). The river stage for this flood was 15.5 feet. A stage of 15.59 feet was recorded on March 15, 1973 (Reference 1). Although the discharge for this flood was only 6010 cfs the stage-discharge relationship was altered by ice formations. Early U.S. Army Corps of Engineers data, in a U.S. Geological Survey publication (Reference 4), indicate that a stage of 16.2 feet was reached in November 1881.

Some scenes of the 1973 flood are shown in Figures 2 and 3.

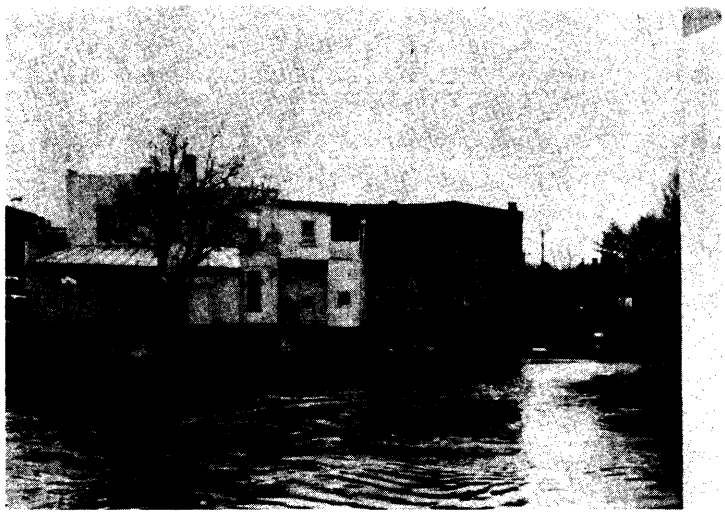

Figure 2. Scene of the March 1973 Flood Looking West From the City Parking Lot Across the Fox River

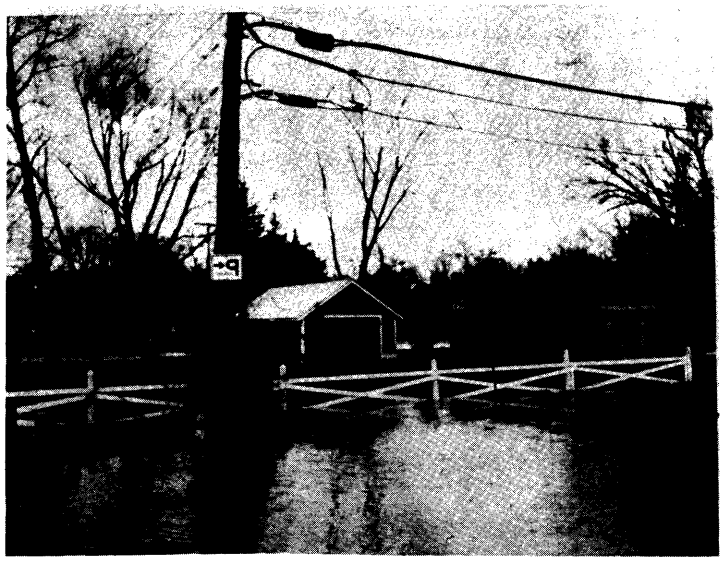

Figure 3. Scene of the March 1973 Flood Looking North From the Corner of Mill and Webster Streets

2.4 Flood Protection Measures

There are no structural flood protection measures in the City of Berlin. There is an abandoned navigational lock and dam in the southwest portion of the city, but it does not provide any flood control for the city.

The City of Berlin has adopted a flood plain zoning ordinance to direct the future development of the city's flood plains. This ordinance restricts the type of development which may occur in all lands adjacent to any stream or river within the city, and which are at, or below, the 760-foot contour line as shown on the official city topographic map.

3.0 ENGINEERING METHODS

For flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10-, 50, 100-, and 500-years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the watersheds of the streams.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each stream segment studied in detail in the city.

For the Fox River, flood flow frequency data were based on statistical analysis of stage-discharge records covering a 76-year period at the Berlin gaging station operated by the U.S. Geological Survey (Reference 1). This analysis followed the standard log-Pearson Type III method as outlined by the Water Resources Council (Reference 5). The 500-year flood discharge was determined by straight-line extrapolation of a log-probability curve of flood discharges computed for frequencies up to 100 years.

For Barnes Creek, Winchell Springs Creek, and its unnamed tributary, flood flow frequency data were based on a regional discharge-frequency curve developed by the U.S. Army Corps of Engineers as part of a previous Flood Plain Information Report for Clintonville, Wisconsin (Reference 6).

Drainage area - peak discharge relationships for stream segments in the city are illustrated in Figure 4.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of streams in the community were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along the segments of each stream studied in detail.

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the U.S. Army Corps of Engineers HEC-2 step backwater computer program (Reference 7). Cross sections for the backwater analyses were field surveyed and were located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures in the highly urbanized areas. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Boundary and Floodway Map (Exhibit 2).

Channel roughness factors (Manning's "n") for these computations were assigned on the basis of field inspection of flood plain areas. For all streams studied in detail, channel roughness coefficients varied from 0.033 to 0.035 and the overbank roughness coefficient was 0.075.

The 100-year flood stage for streams studied by approximate methods was determined by solving Manning's equation for depth of flow in the channel (Reference 8). These streams were field inspected to obtain typical stream cross sections, average streambed slope, and Manning's "n" values.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1). Starting elevations for the Fox River were selected by trial and error, such that the computed water-surface elevations at the Berlin gage were equivalent to the values obtained from a U.S. Geological Survey rating curve at this same location (Reference 9). For the other streams, starting elevations were developed by the slope-area method. All elevations are referenced to the National Geodetic Vertical Datum of 1929. Elevation reference marks used in the study are shown on the maps.

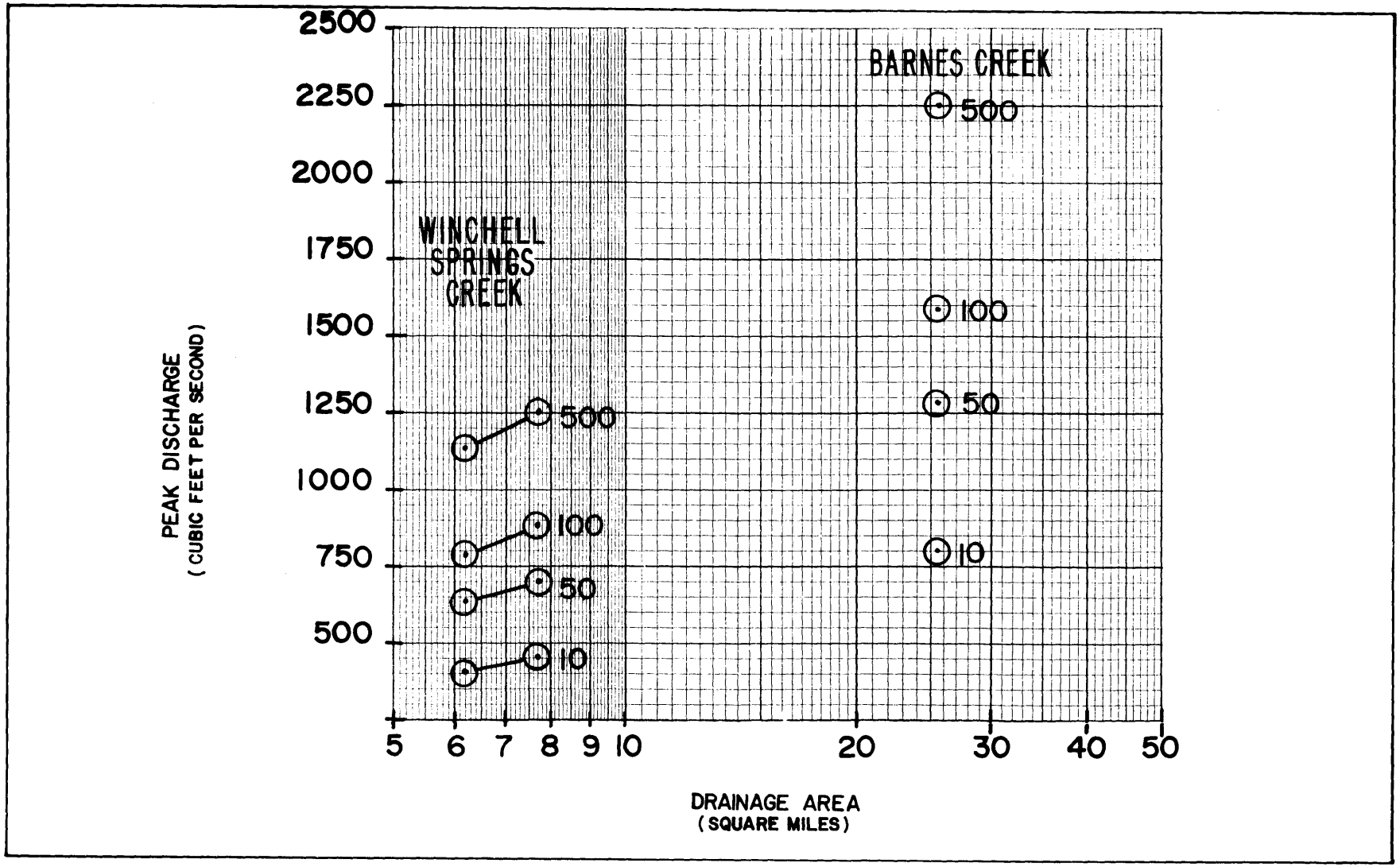

FIGURE 4

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI

(GREEN LAKE AND WAUSHARA COS.)

FREQUENCY-DISCHARGE, DRAINAGE AREA CURVES

BARNES CREEK, WINCHELL SPRINGS CREEK

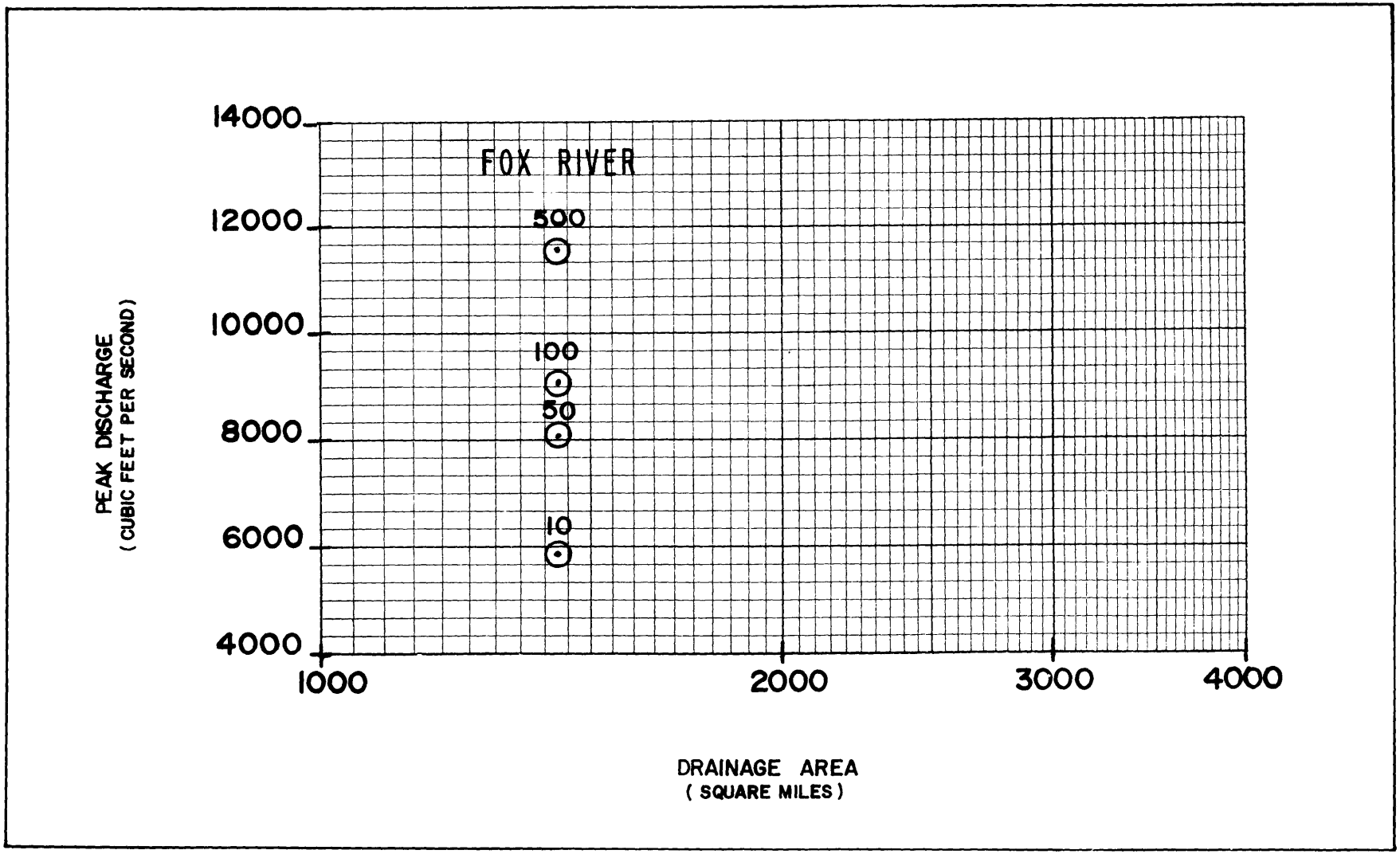

FIGURE 4

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WAUSHARA COS.)

FREQUENCY-DISCHARGE, DRAINAGE AREA CURVES

FOX RIVER

As noted previously, flood elevations in the city are often raised by ice jams during spring thaws. The hydraulic analyses for this study, however, are based only on the effects of unobstructed flow. The flood elevations, as shown on the profiles, are thus considered valid only if hydraulic structures in general remain unobstructed, and dams and other flood control structures operate properly and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community.

For each stream studied in detail, the boundaries of the 100- and the 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4800, with a contour interval of 2 feet (Reference 10), and a contour map at a scale of 1:6000, with a 1 foot contour interval (Reference 11). In cases where the 100- and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

For streams studied by approximate methods, the boundaries have been delineated by relating approximate 100-year elevations to topographic maps (Reference 10).

Small areas within the flood boundaries may lie above the flood elevations, and therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity and increases flood

heights, thus increasing flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodway for this study was computed on the basis of effective flow area in accordance with State of Wisconsin guidelines. That is, the floodway is defined by the limit of encroachment on both banks which will not cause any significant stage rise (usually 0.1 to 0.5 foot) above the 100-year flood plain elevation. The results of these computations are tabulated at selected cross sections for each stream studied in detail (Table 1). As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. Where the boundaries of the floodway and the 100-year flood are close together, only the floodway boundary has been shown. Portions of the Fox River floodway extend outside the corporate limits of Berlin.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood significantly at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 5.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
WINCHELL SPRINGS CREEK							
A	0.06	104	243	3.29	754.64[2]	754.57[2]	0.07
B	0.09	110	633	1.26	759.37[2]	759.37[2]	0.00
C	0.18	690	3371	0.24	759.45[2]	759.41[2]	0.04
D	0.20	725	3105	0.25	759.45[2]	759.42[2]	0.03
E	0.35	250	836	0.94	759.47[2]	759.43[2]	0.04
F	0.37	175	742	1.06	759.52[2]	759.49[2]	0.03
G	0.41	50	241	3.28	759.58[2]	759.55[2]	0.03
H	0.44	50	268	2.95	761.30	761.30	0.00
I	0.51	75	379	2.08	761.76	761.76	0.00
J	0.54	780	2717	0.29	762.10	762.04	0.06
K	0.61	1310	3693	0.21	762.11	762.05	0.06
L	0.80	1120	1584	0.50	762.14	762.09	0.05
M	0.95	950	981	0.81	762.28	762.23	0.05

[1] Miles Above Confluence With Fox River [2] Water-Surface Elevations Without Considering Fox River Backwater

TABLE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WANSHARA COS.)

FLOODWAY DATA

WINCHELL SPRINGS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
FOX RIVER							
A	85.10[1]	900[2]	3,566	2.54	755.30	755.29	0.01
B	85.78[1]	416	2,730	3.32	756.61	756.11	0.50
C	86.06[1]	307	2,579	3.52	757.04	756.54	0.50
D	86.09[1]	356[2]	2,130	4.26	757.09	756.59	0.50
E	86.42[1]	460	3,884	2.34	757.89	757.47	0.42
F	86.54[1]	588	1,961	4.59	757.91	757.51	0.40
G	87.03[1]	293	2,642	3.41	759.06	758.77	0.29
H	87.39[1]	550	2,764	3.26	759.51	759.25	0.26
I	87.44[1]	130	1,880	4.79	759.61	759.36	0.25
J	87.47[1]	175	3,406	2.64	760.19	759.95	0.24
K	87.86[1]	660	5,440	1.65	760.52	760.29	0.23
L	88.48[1]	2090[2]	14,067	0.64	760.77	760.47	0.30
M	89.00[1]	1464[2]	12,701	0.71	760.83	760.51	0.32
N	89.30[1]	1403[2]	8,414	1.07	760.88	760.55	0.33
O	89.32[1]	1232[2]	8,213	1.10	760.88	760.55	0.33
P	89.35[1]	2415[2]	14,281	0.63	760.92	760.56	0.36
Q	89.89[1]	3266[2]	24,301	0.37	760.97	760.61	0.36
R	90.56[1]	3399[2]	26,646	0.34	761.01	760.66	0.35
BARNES CREEK							
A	0.44[3]	135	314	5.03	758.09[4]	758.09[4]	0.00
B	0.47[3]	160	1,142	1.38	758.64	758.64	0.00
C	0.85[3]	240	1,300	1.22	759.61	759.55	0.06
D	1.34[3]	320	1,010	1.56	760.44	760.36	0.08
E	1.82[3]	300	1,209	1.31	761.41	761.31	0.10
F	1.86[3]	70	311	5.08	762.10	761.96	0.14

[1]Miles Above Mouth [2]Portion of Floodway Outside Corporate Limits [3]Miles Above Confluence With Fox River [4]Water-Surface Elevations Without Considering Fox River Backwater

TABLE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WANSHARA COS.)

FLOODWAY DATA

FOX RIVER-BARNES CREEK

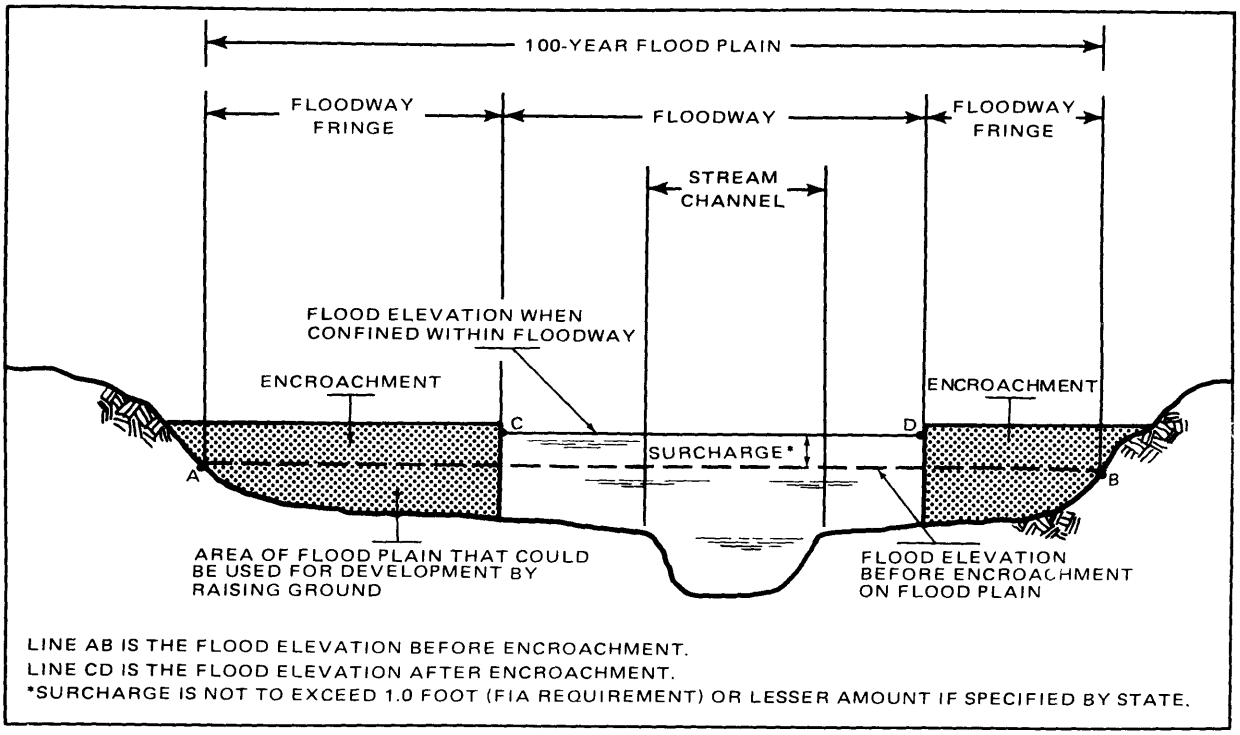

Figure 5. Floodway Schematic

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each of the segments of each flooding source studied in detail affecting Berlin.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot

Three reaches meeting the above criteria were required for the flooding sources of Berlin, one for each stream studied. The locations of the reaches are shown on the Flood Profiles (Exhibit 1).

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is the Federal Insurance Administration device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHF are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective Flood Hazard Factors, the entire incorporated area of the City of Berlin was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special flood hazard areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations or Flood Hazard Factors determined.
Zones A3 and A4:	Special flood hazard areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to Flood Hazard Factors.

Zone B: Areas between the special flood hazard area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 2, "Flood Insurance Zone Data," summarizes the flood elevation differences, Flood Hazard Factors, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Berlin is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Insurance Administration.

6.0 OTHER STUDIES

The firm of Owen Ayres and Associates is performing a Flood Insurance Study for the unincorporated areas of Green Lake County. The flood profiles and insurance zones reflected in this study have been coordinated with, and are in agreement with, those areas of the Green Lake County study where the two coincide. However, due to better detailed topographic information being available for the City of Berlin, the flood boundaries do not precisely agree between these two studies.

The Flood Insurance Study for the City of Berlin is authoritative for purposes of the Federal Insurance Administration and presented information supersedes all previous determinations.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
FOX RIVER Reach 1	01	-1.83	-0.45	+1.21	020	A4	Varies - See Map
BARNES CREEK Reach 1	01	-1.66	-0.53	+0.89	015	A3	Varies - See Map
WINCHELL SPRINGS CREEK Reach 1	01	-2.14	-0.53	+2.64	020	A4	Varies - See Map

[1] FLOOD INSURANCE RATE MAP PANEL [2] WEIGHTED AVERAGE [3] ROUNDED TO NEAREST FOOT

TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WANSHARA COS.)

FLOOD INSURANCE ZONE DATA

FOX RIVER-BARNES CREEK-WINCHELL SPRINGS CREEK

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study are on file indefinitely at the office of the U.S. Army Corps of Engineers, Chicago District, 219 South Dearborn Street, Chicago, Illinois 60604.

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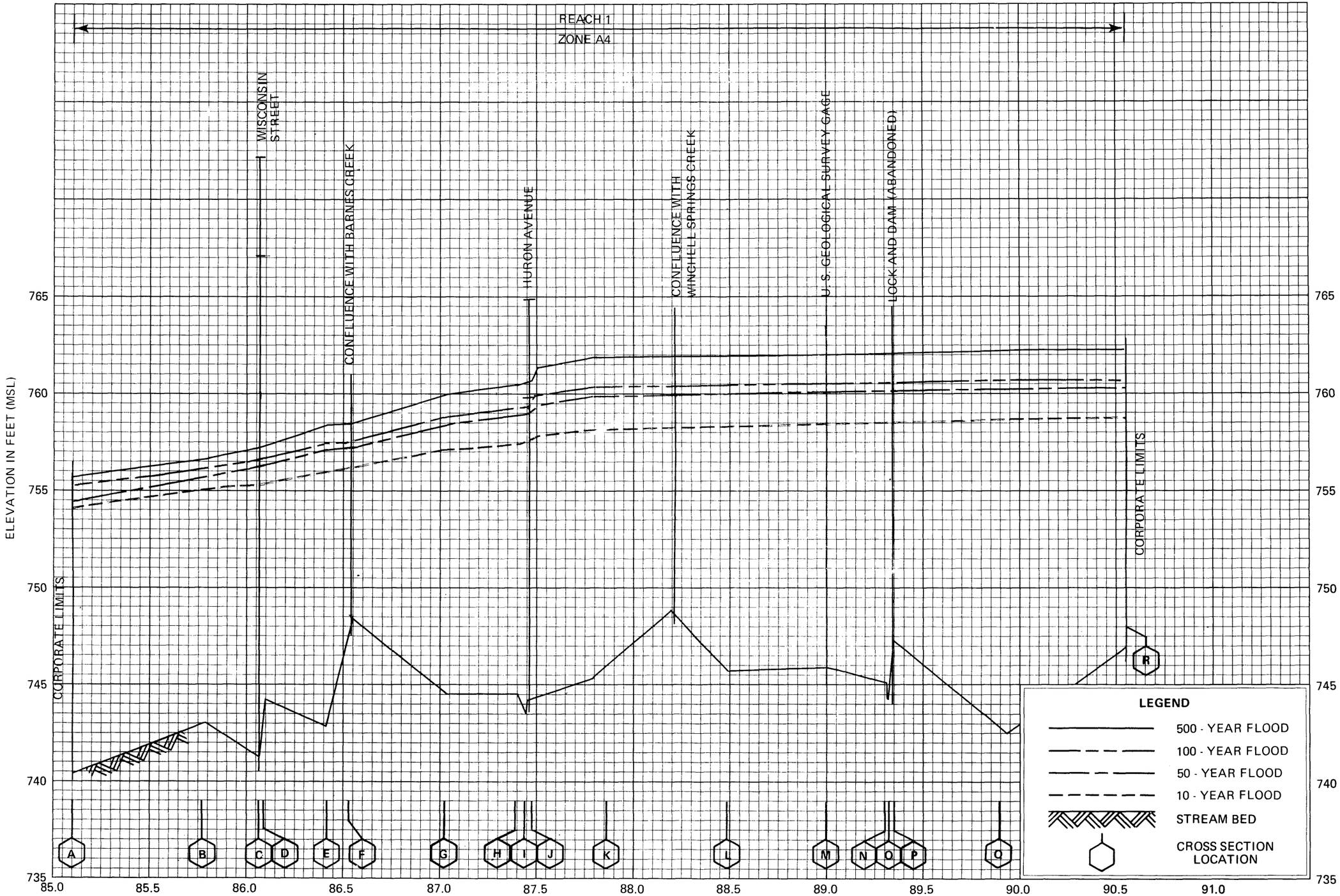
11. City of Berlin Planning Commission Coordinator, Contour Map, Scale 1:6000, Contour Interval 1 foot: Berlin, Wisconsin (1972)

    City of Berlin, Wisconsin, The Comprehensive Plan, Berlin, Wisconsin, November 1967



FLOOD PROFILES

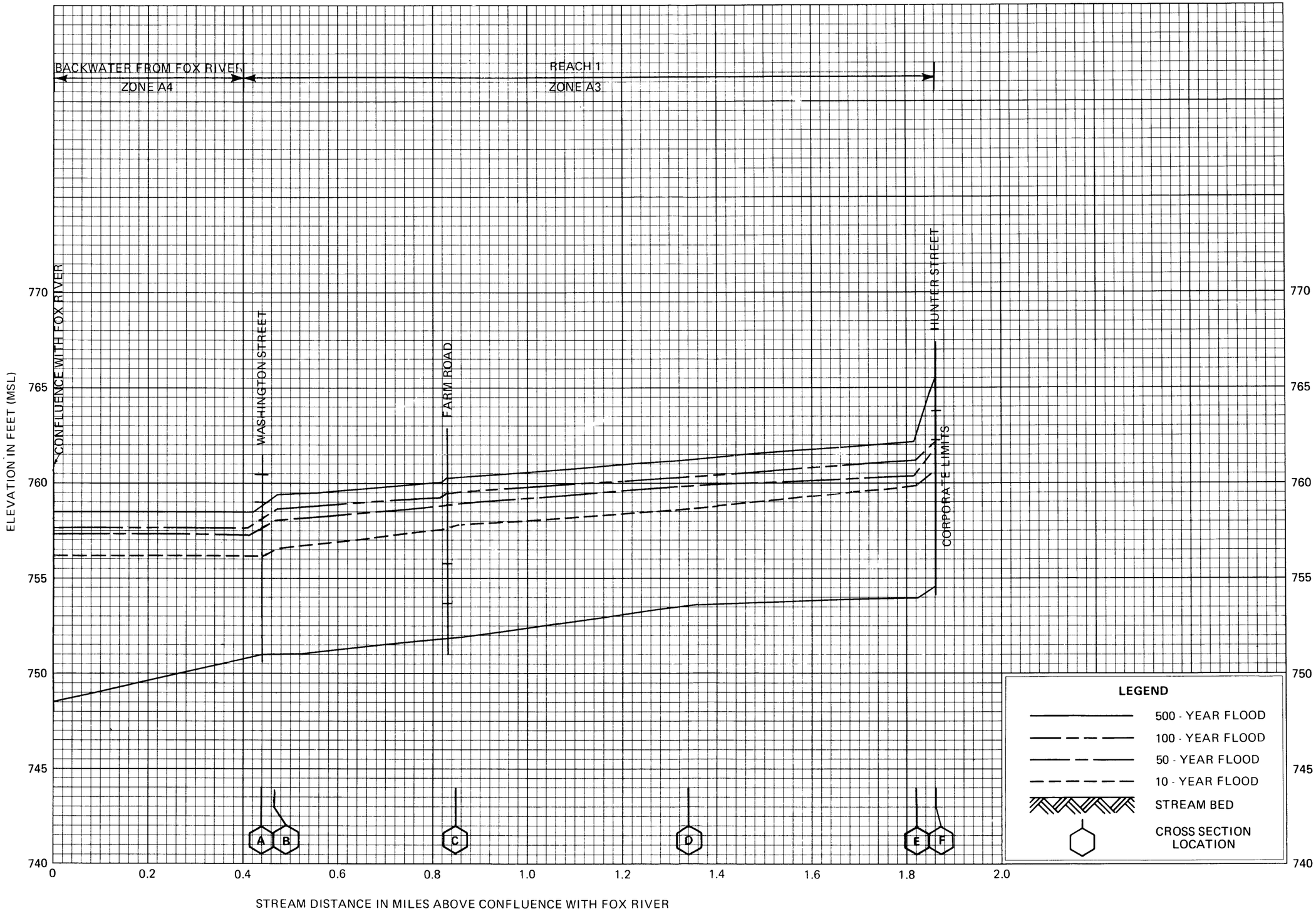
FOX RIVER

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI

(GREEN LAKE AND WAUSHARA COS.)

01P



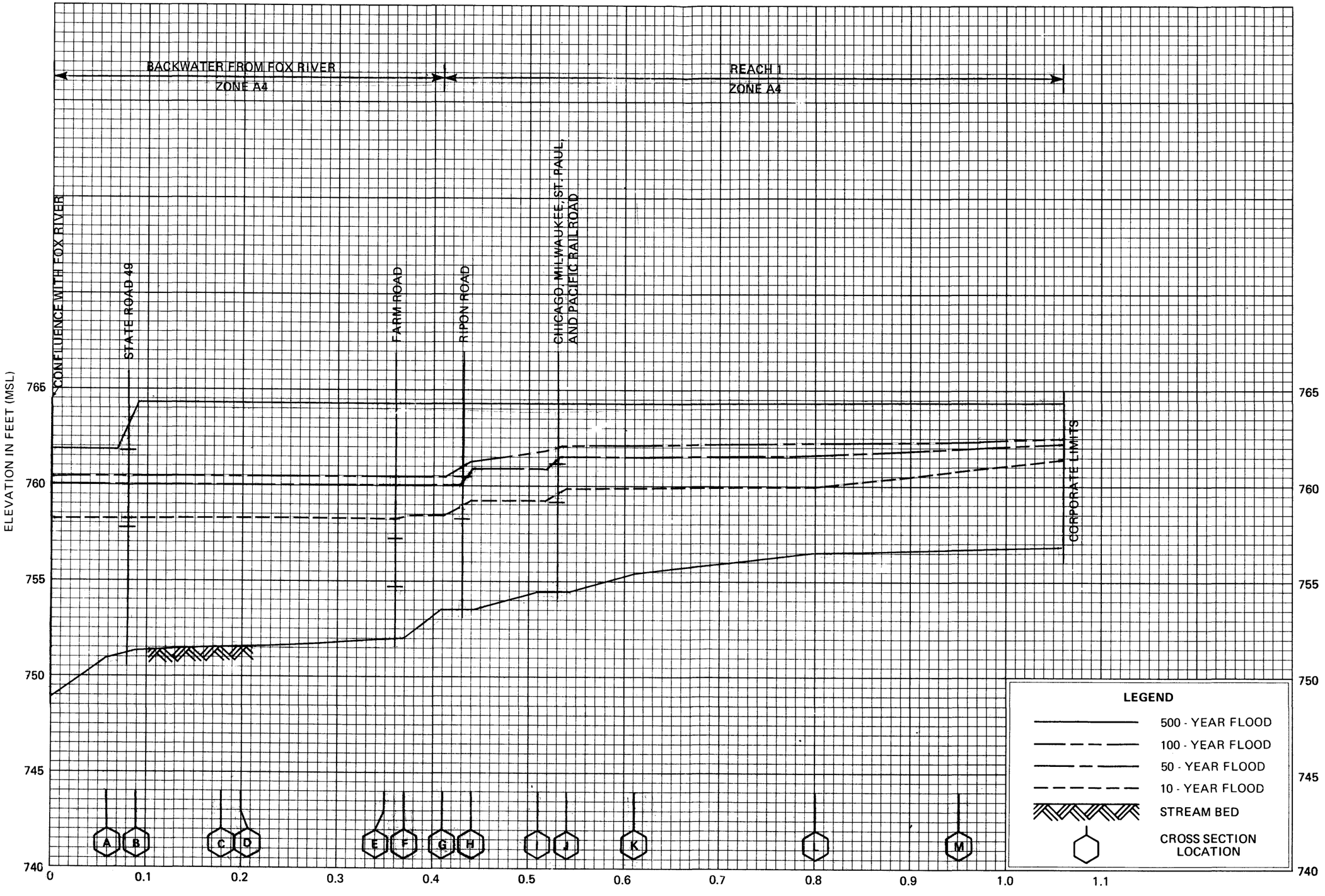
FLOOD PROFILES

BARNES CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WAUSHARA COS.)

02P



FLOOD PROFILES

WINCHELL SPRINGS CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF BERLIN, WI
(GREEN LAKE AND WAUSHARA COS.)

03P