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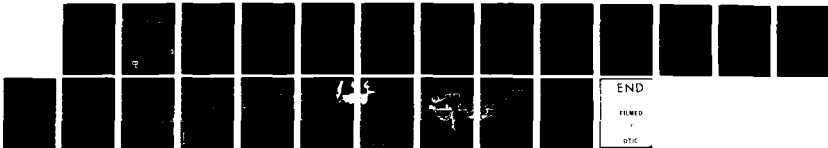
ELLICOTT CREEK ERIE COUNTY NEW YORK SPECIAL FLOOD
HAZARD EVALUATION REPORT(U) CORPS OF ENGINEERS BUFFALO
NY BUFFALO DISTRICT R W WADE JAN 83

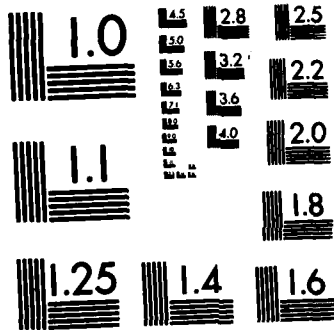
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Special Flood Hazard Evaluation Report

(12)

AD A 1 24 829

Ellicott Creek

Erie County
New York

Prepared For
Town Of Alden

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SELECTED
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January 1983

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A424 829	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Special Flood Hazard Evaluation Report, Ellicott Creek, Erie County, New York.		5. TYPE OF REPORT & PERIOD COVERED FINAL
7. AUTHOR(s) ROBERT W. WADE		6. PERFORMING ORG. REPORT NUMBER N/A
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Engineer District, Buffalo 1776 Niagara Street Buffalo, NY 14207		8. CONTRACT OR GRANT NUMBER(s) N/A
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Engineer District, Buffalo 1776 Niagara Street Buffalo, NY 14207		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS ANB05 07010 00000
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE January 1983
		13. NUMBER OF PAGES 12
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release, distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Prepared in cooperation with town of Alden, NY		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Geographic Information Flood Plain Flood Profiles Floodway Flood Plain Management Flood Boundaries		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information on the flood plain, floodway, and flood profiles for a selected reach of Ellicott Creek within the town of Alden, NY for use in a flood plain management program.		

SPECIAL FLOOD HAZARD /
EVALUATION REPORT
ELLICOTT CREEK
TOWN OF ALDEN, ERIE COUNTY, NY

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SPECIAL FLOOD HAZARD
EVALUATION REPORT
ELLICOTT CREEK
TOWN OF ALDEN, ERIE COUNTY, NY

INTRODUCTION

This Special Flood Hazard Evaluation Report investigates the potential flood situation along Ellicott Creek from Crittenden Road Bridge upstream to the County Line Road Bridge, a distance of 2.9 miles. Most of the area along the stream is agricultural or residential. Although large floods have occurred, studies indicate that even larger floods are possible.

This report has been prepared because a knowledge of potential floods and flood hazards is important in land use planning. It includes a history of flooding along Ellicott Creek and identifies those areas that are subject to possible future floods. Special emphasis is given to these floods through maps and water surface profiles. The report does not provide solutions to flood problems. However, it does furnish a suitable basis for the adoption of land use controls to guide flood plain development and thereby prevents intensification of the flood loss problem. It will also aid in the development of other flood damage reduction techniques to modify flooding and reduce flood damages which might be embodied in an overall Flood Plain Management (FPM) program. Other studies, those of environmental attributes and the current and future land use role of the flood plain as part of its surroundings, would also profit from this information.

The report was prepared at the request of the town of Alden.

The assistance and cooperation of Krehbiel Associates, Inc., Town Engineers, in supplying useful data for the preparation of this report are appreciated.

Additional copies of this report can also be obtained from the New York State Department of Environmental Conservation. The Buffalo District Corps of Engineers will provide technical assistance and guidance to planning agencies in the interpretation and use of the data.

PAST FLOODS

Along Ellicott Creek, the greatest flood of record occurred in March 1936. A more recent flood occurred in July 1963 as a result of an intensive rainstorm of 6 inches. No detailed flooding records are available for the community in the area of this study.

FUTURE FLOODS

Floods of the same or larger magnitude as those that have occurred in the past are likely to occur some time in the future. Larger floods have been experienced in the past on streams with similar geographical and physiological characteristics to those found in the study area. Similar combinations of rainfall, snowmelt, and runoff which caused these floods could occur within the study area. To assess the flooding potential of the study

area, it is necessary to consider storms and floods that have occurred in regions with the same topography, watershed cover, and physical characteristics.

Flood Magnitudes and Their Frequencies

Floods are classified on the basis of their frequency or return period. A 100-year flood is an event whose magnitude can be expected to be equaled or exceeded on the average of once every hundred years. The 100-year event has a 1 percent chance of occurrence in any given year. It is important to note that, while on a long-term basis the occurrence averages out to once per hundred years, floods of this magnitude can occur in any given year or even in consecutive years and within any given time interval. The 100-year flood is also known as the Base Flood.

Similarly, the 10, 50, and 500-year flood events are those floods whose magnitudes can, on the long term, be expected to occur on the average of once in every 10, 50, or 500 years.

It should be noted that there is a greater than 50 percent probability that a 100-year flood event will occur during a 70-year lifetime. Additionally, a house which is built at the 100-year flood level has about a one in four chance of being flooded in a 30-year mortgage life.

Table 1 is a summary of peak discharges for two recurrence intervals (in years).

Table 1 - Peak Flows on Ellicott Creek

Location	Drainage Area (sq. mi.)	100-Year Flood Discharge (cfs)	500-Year Discharge (cfs)
Ellicott Creek at Crittenden Road Bridge	16.6	3,700	4,500

A 500-year frequency flood is defined as a flood having an average frequency of occurrence in the order of once in 500 years at a designated location, or a flood having a 0.2 percent chance of occurrence in any given year. It is generally recognized as an upper level of anticipated flooding that should be used in community planning of critical structures. A flood of this magnitude is usually catastrophic, especially when they occur in developed stream valleys.

Hazards and Damages of Large Floods

The extent of damage caused by any flood depends on the topography of the flooded area, the depth and duration of flooding, the velocity of flow, the rate of rise in water surface elevation, and developments in the flood plain. Deep water flowing at a high velocity and carrying floating debris would create conditions hazardous to persons and vehicles which attempt to cross the flood plain. Generally, water 3 or more feet deep which flows at a velocity of 3 or more feet per second could easily sweep an adult off his

feet and create definite danger of injury or drowning. Rapidly rising and swiftly flowing floodwater may trap persons in homes that are ultimately destroyed or in vehicles that are ultimately submerged or floated. Since waterlines can be ruptured by deposits of debris and by the force of flood waters, there is the possibility of contaminated domestic water supplies. Damaged sanitary sewer lines and sewage treatment plants could result in the pollution of flood waters and could create health hazards. Isolation of areas by floodwater could create hazards in terms of medical, fire, or law enforcement emergencies.

Flooded Areas

Plate 1 shows water surface profiles for the 500 and 100-year floods. Depth of flow in the channel can be estimated from this plate. The town of Alden maps, sheets 40, 41, and 49, show the flooded area. The areas that would be inundated by the 100-year and 500-year floods are shown in detail on those plates. The actual limits of these overflow areas may vary somewhat from those shown on the maps because the scale of the maps do not permit precise plotting of the flooded area boundaries.

Table 2 is a list of elevation reference marks. The list is furnished as an aid to local interests in setting minimum elevations for future development or establishing other elevations necessary to flood plain planning. All elevations in this report are on the National Geodetic Vertical Datum of 1929.

Table 2 - Elevation Reference Marks in the Town of Alden Study Area

Reference Mark	Elevation (NGVD)(1) (feet)	Description of Location
RM 3	824.01	A chiseled cross on northeast corner of the north abutment of Crittenden Road Bridge over Ellicott Creek.
RM 4	835.16	A railroad spike, 1 foot above ground, on south side of NYSE&G pole 533-84 and NYT pole 19 near northeast corner of North Road Bridge over Ellicott Creek 2,620+ feet east of centerline of Crittenden Road.
RM 5	831.52	A chiseled cross on southeast corner of the south abutment of North Road Bridge over Ellicott Creek 2,430+ feet west of centerline of County Line Road.
RM 6	832.02	A chiseled square painted orange on northeast corner of the north abutment of North Road Bridge over Ellicott Creek 1,570+ feet west of centerline of County Line Road.

(1) Elevation reference marks used in the study are shown on the maps.

Obstructions

During floods, debris collecting on bridges could decrease their flow-carrying capacity and cause greater water depths (backwater effect) upstream of these structures. Since the occurrence and amount of debris are indeterminate factors, only the physical characteristics of the structures were considered in preparing the profiles. No reduction in the carrying capacity from clogging or jamming was considered. Similarly, the flooded area maps show the backwater effect of obstructive bridges, but do not reflect increased water surface elevations that could be caused by debris collecting against the structures.

UNIFIED FLOOD PLAIN MANAGEMENT PROGRAMS

Historically, the alleviation of flood damage has been accomplished almost exclusively by the construction of protective works such as reservoirs, channel improvements, and floodwalls and levees. However, in spite of the billions of dollars that have already been spent for construction of well-designed and efficient flood control works, annual flood damages continue to accelerate because the number of persons and structures occupying floodprone lands is increasing faster than protective works can be provided.

Recognition of this trend in recent years has forced a reassessment of the flood control concept and resulted in the broadened concept of unified flood plain management programs. Legislative and administrative policies frequently cite two approaches - structural and nonstructural - for adjusting to the flood hazard. In this context, "structural" is usually intended to mean adjustments that modify the behavior of floodwaters through the use of measures such as public works dams and channel work. "Nonstructural" is usually intended to include all other adjustments (e.g., regulations, floodproofing, insurance, etc.) in the way society acts when occupying or modifying a flood plain. Both structural and nonstructural tools are used for achieving desired future flood plain conditions. There are three basic strategies which may be applied individually or in combination: (1) modifying the susceptibility to flood damage and disruption, (2) modifying the floods themselves, and (3) modifying (reducing) the adverse impacts of floods on the individual and the community.

Modify Susceptibility to Flood Damage and Disruption

The strategy to modify susceptibility to flood damage and disruption consists of actions to avoid dangerous, economic, undesirable, or unwise use of the flood plain. Responsibility for implementing such actions rests largely with the non-Federal sector.

These actions include restrictions in the mode and the time of occupancy; in the ways and means of access; in the pattern, density, and elevation of structures and in the character of their materials (structural strength, absorptiveness, solubility, corrodibility); in the shape and type of buildings and in their contents; and in the appurtenant facilities and landscaping of the grounds. The strategy may also necessitate changes in the

interdependencies between flood plains and surrounding areas not subject to flooding, especially interdependencies regarding utilities and commerce.

Implementing tools for these actions include land use regulations, development and redevelopment policies, floodproofing, disaster preparedness and response plans, and flood forecasting and warning systems. Different tools may be more suitable to developed or underdeveloped flood plains or to urban or rural areas. The information contained in this report is particularly useful for the preparation of flood plain regulations.

a. Flood Plain Regulations.

Flood plain regulations apply to the full range of ordinances and other means designed to control land use and construction within floodprone areas. The term encompasses zoning ordinances, subdivision regulations, building and housing codes, encroachment line statutes, open area regulations, and other similar methods of management which affect the use and development of floodprone areas.

Flood plain land use management does not prohibit use of floodprone areas; to the contrary, flood plain land use management seeks the best use of flood plain lands. The flooded area maps and the water surface profiles contained in this report can be used to guide development in the flood plain. The elevations shown on the profiles should be used to determine flood heights because they are more accurate than the flooded outlines. Development in areas susceptible to frequent flooding should consist of construction which has a low damage potential such as parking areas and golf courses. If high value construction such as buildings are considered for areas subject to frequent flooding, the land should be elevated to minimize damages. If it is uneconomical to elevate the land in these areas, means of flood proofing the structures should be given careful consideration.

b. Development Zones.

A flood plain consists of two useful zones. The first zone is the designated "floodway" or that cross sectional area required for carrying or discharging the anticipated flood waters with a maximum 1-foot increase in flood levels. Velocities are the greatest and most damaging in the floodway. Regulations essentially maintain the flow-conveying capability of the floodway to minimize inundation of additional adjacent areas. Uses which are acceptable for floodways include parks, parking areas, open spaces, etc.

The second zone of the flood plain is termed the "floodway fringe" or restrictive zone, in which inundation might occur but where depths and velocities are generally low. Such areas can be developed provided structures are placed high enough or floodproofed to be reasonably free from flood damage during the Base (100-year) Flood.

c. Formulation of Flood Plain Regulations.

Formulation of flood plain regulations in a simplified sense involves selecting the type and degree of control to be exercised for each specific

flood plain. In principal, the form of the regulations is not as important as a maintained adequacy of control. The degree of control normally varies with the flood hazard as measured by depth of inundation, velocity of flow, frequency of flooding, and the need for available land. Considerable planning and research is required for the proper formulation of flood plain regulations. Where formulation of flood plain regulation is envisioned to require a lengthy period of time during which development is likely to occur, temporary regulations should be adopted to be amended as necessary.

Modify Flooding

The traditional strategy of modifying floods through the construction of dams; dikes, levees, and floodwalls; channel alternations; high flow diversions and spillways; and land treatment measures has repeatedly demonstrated its effectiveness for protecting property and saving lives, and it will continue to be a strategy of flood plain management. However, in the future, reliance solely upon a flood modification strategy is neither possible nor desirable. Although the large capital investment required by flood modifying tools has been provided largely by the Federal Government, sufficient funds from Federal sources have not been and are not likely to be available to meet all situations for which flood modifying measures would be both effective and economically feasible. Another consideration is that the costs of maintaining and operating flood control structures fall upon local Governments except for major Federal reservoirs with flood control storage.

Flood modifications acting alone leave a residual flood loss potential and can encourage an unwarranted sense of security leading to inappropriate use of lands in the areas that are directly protected and often in adjacent areas. For this reason, measures to modify possible floods should usually be accompanied by measures to modify the susceptibility to flood damage, particularly by land use regulations.

Flood modifying tools permit changes in the volume of runoff, in the peak stage of the flood, in the time of rise and duration, in the extent of the area flooded, in the velocity and depth of floodwaters, and consequently in the amount of debris, sediment, and pollutants that floods carry.

Modify the Impact of Flooding on Individuals and the Community

A third strategy for mitigating flood losses consists of actions designed to assist individuals and communities in their preparatory, survival, and recovery responses to floods. Tools include information dissemination and education, arrangements for spreading the costs of the loss over time, and purposeful transfer of some of the individual's loss to the community.

The distinction between a reasonable and unreasonable transfer of costs from the individual to the community can also be regulated and is the key to effective flood plain management.

GLOSSARY

- BACKWATER** The resulting high water surface in a given stream due to a downstream obstruction or high stages in an intersecting stream.
- BASE FLOOD** A flood which has an average frequency of occurrence in the order of once in 100 years although the flood may occur in any year. It is based on statistical analysis of streamflow records available for the watershed and analysis of rainfall and runoff characteristics in the general region of the watershed. It is commonly referred to as the "100-year flood."
- DISCHARGE** The quantity of flow in a stream at any given time, usually measured in cubic feet per second (cfs).
- FLOOD** An overflow of lands not normally covered by water. Floods have two essential characteristics: The inundation of land is temporary; and the lands are adjacent to and inundated by overflow from a river, stream, ocean, lake, or other body of standing water.
- Normally a "flood" is considered as any temporary rise in streamflow or stage, but not the ponding of surface water, that results in significant adverse effects in the vicinity. Adverse effects may include damages from overflow of land areas, temporary backwater effects in sewers and local drainage channels, creation of unsanitary conditions or other unfavorable situations by deposition of materials in stream channels during flood recessions, rise of groundwater coincident with increased streamflow, and other problems.
- FLOOD CREST** The maximum stage or elevation reached by floodwaters at a given location.
- FLOOD FREQUENCY** A statistical expression of the average time period between floods equaling or exceeding a given magnitude. For example, a 100-year flood has a magnitude expected to be equaled or exceeded on the average of once every hundred years; such a flood has a 1 percent chance of being equaled or exceeded in any given year. Often used interchangeably with RECURRENCE INTERVAL.
- FLOOD PLAIN** The areas adjoining a river, stream, watercourse, ocean, lake, or other body of standing water that have been or may be covered by floodwater.

FLOOD PROFILE

A graph showing the relationship of water surface elevation to location; the latter generally expressed as distance upstream from mouth for a stream of water that flows in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.

FLOOD STAGE

The stage or elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area in which the elevation is measured.

FLOODWAY

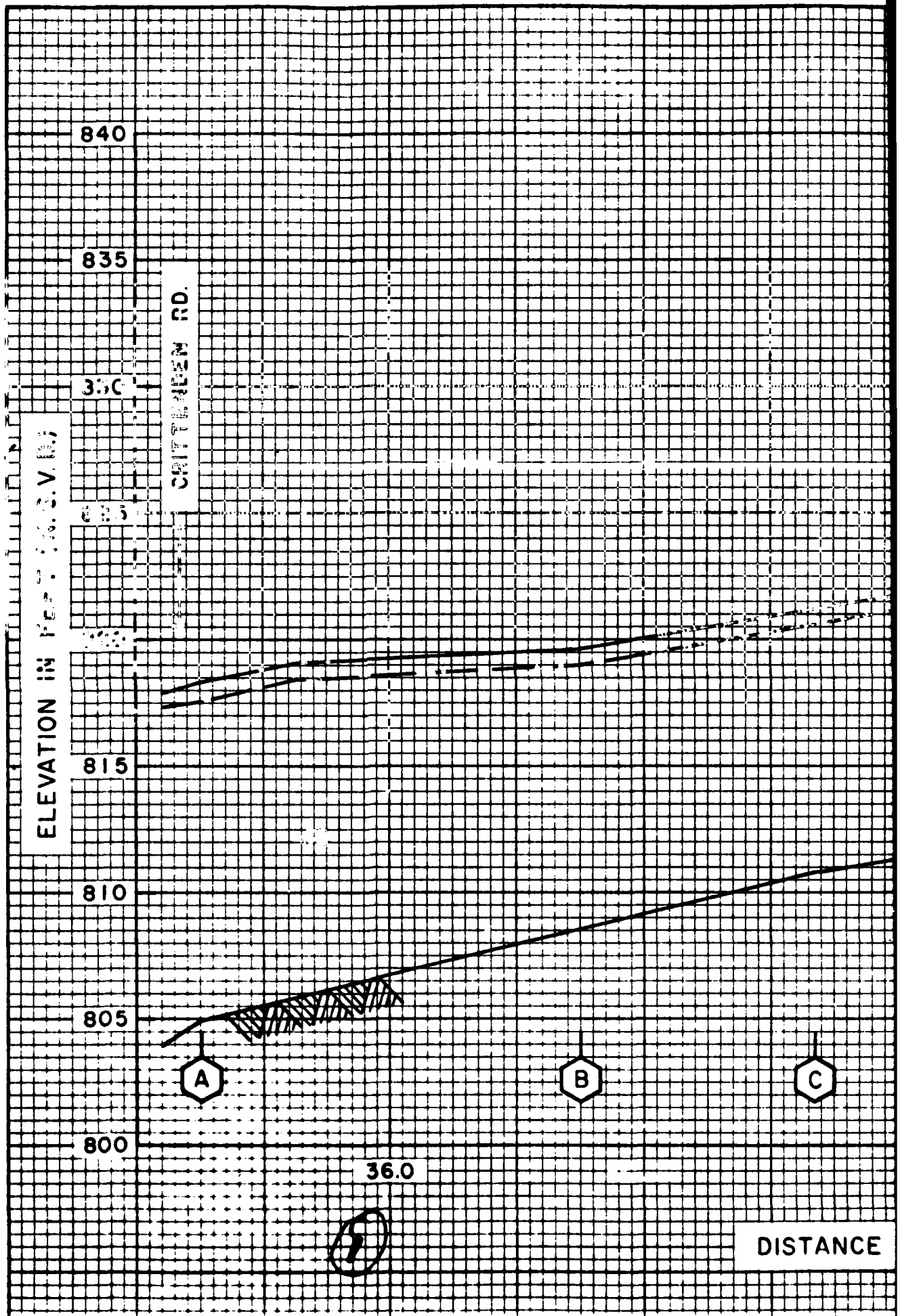
The channel of a watercourse and those portions of the adjoining flood plain required to provide for the passage of the selected flood (normally the 100-year flood) with an insignificant increase in the flood levels above that of natural conditions. As used in the National Flood Insurance Program, floodways must be large enough to pass the 100-year flood without causing an increase in elevation of more than a specified amount (1 foot in most areas).

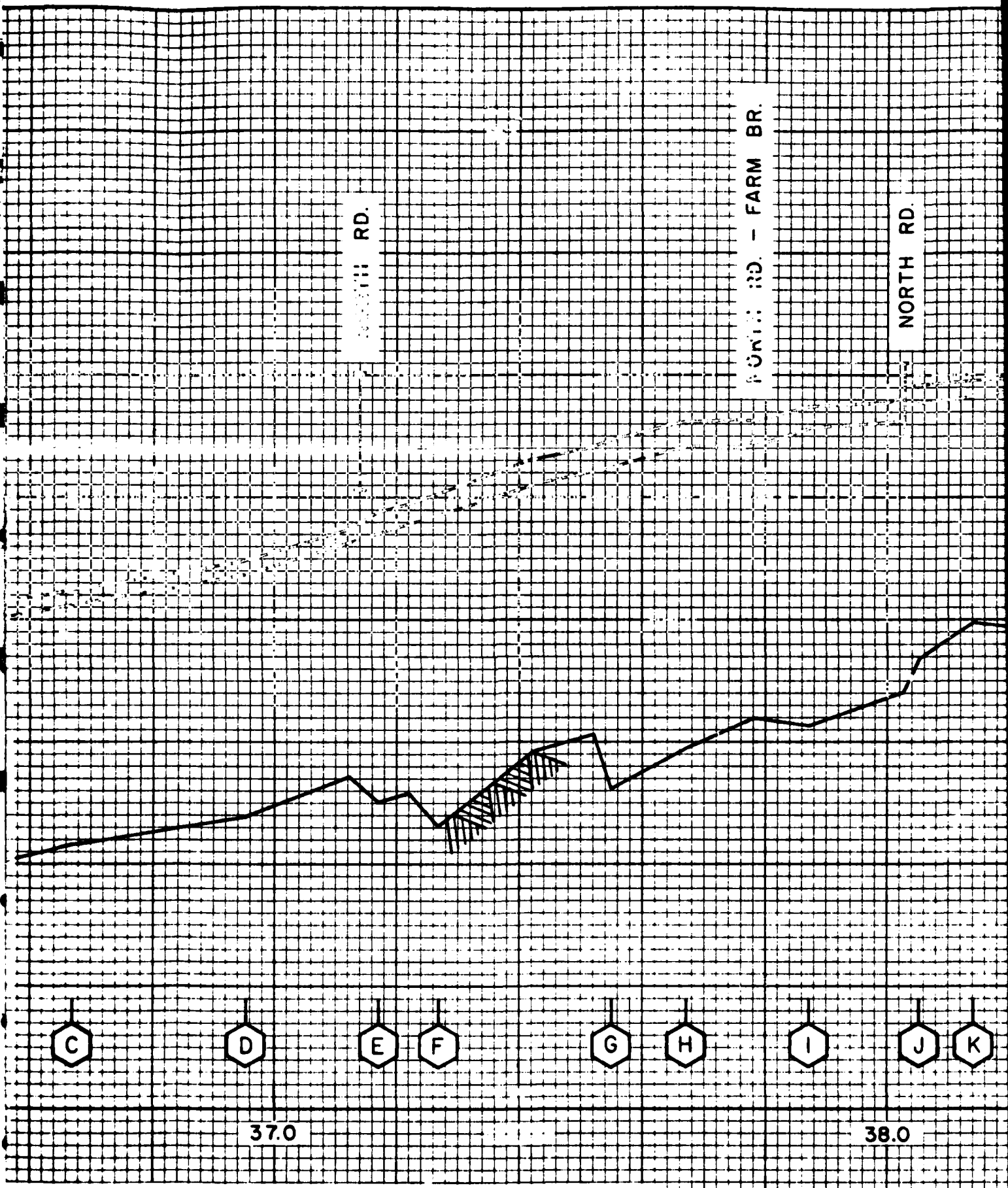
LOW CHORD

The elevation at the top of the opening of a bridge or other structure through which water may flow along a watercourse.

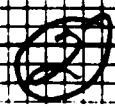
RECURRENCE INTERVAL

A statistical expression of the average time between floods equalling or exceeding a given magnitude (see FLOOD FREQUENCY).





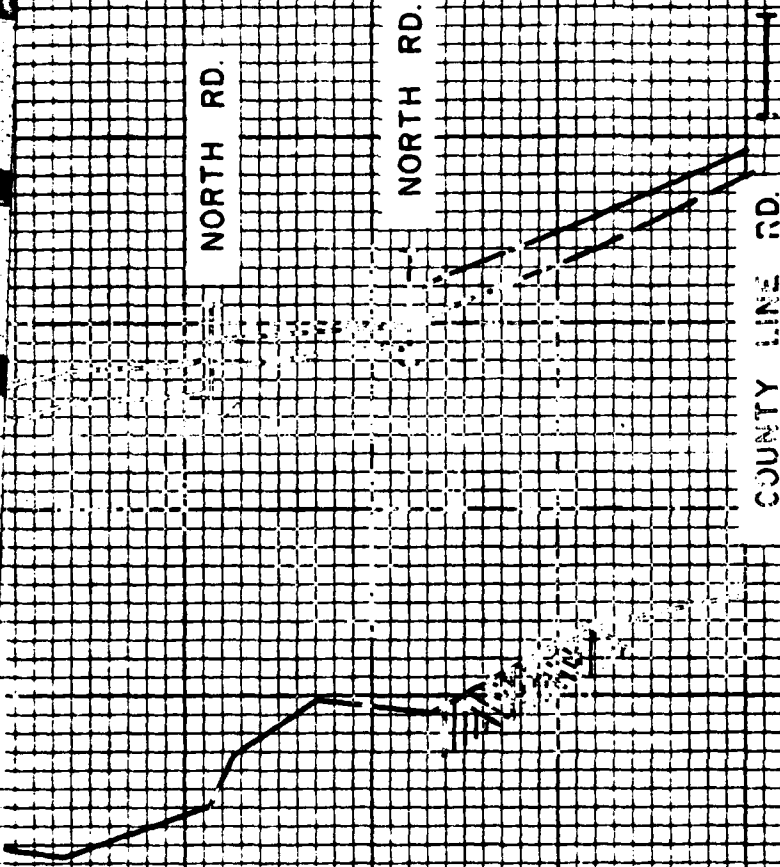
DISTANCE IN MILES UPSTREAM FROM THE MOUTH



NORTH RD.

NORTH RD.

COUNTY LINE RD.



LEGEND

- 500 YEAR FLOOD
- - - 100 YEAR FLOOD
- ▨ STREAM BED
- ⬡ E CROSS SECTION LOCATION

I J K L M N

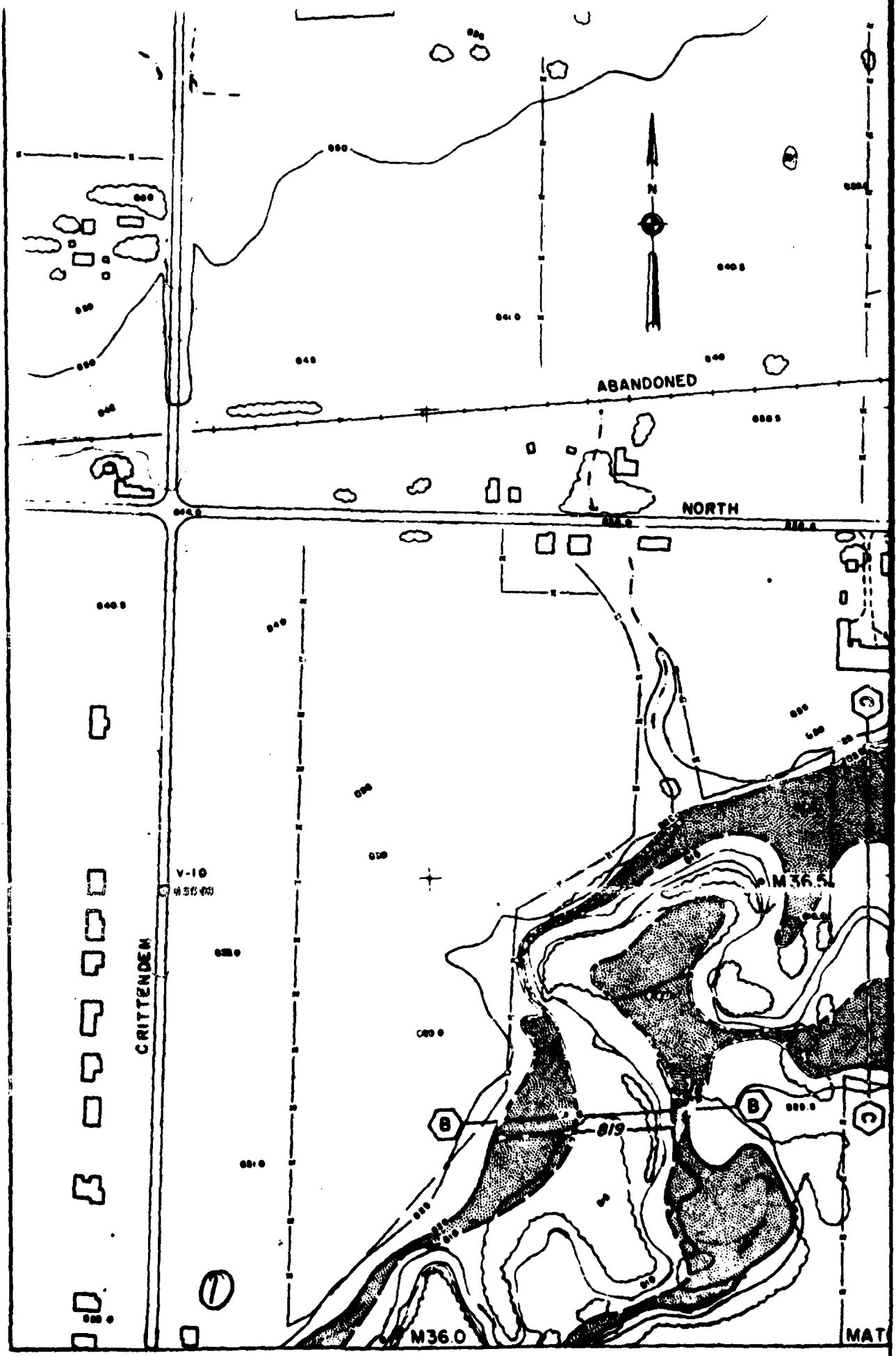
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DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
BUFFALO, NEW YORK

FLOOD HAZARD EVALUATION
ELLICOTT CREEK
TOWN OF ALDEN
FLOOD PROFILES

JANUARY 1983

3



ABANDONED

NORTH

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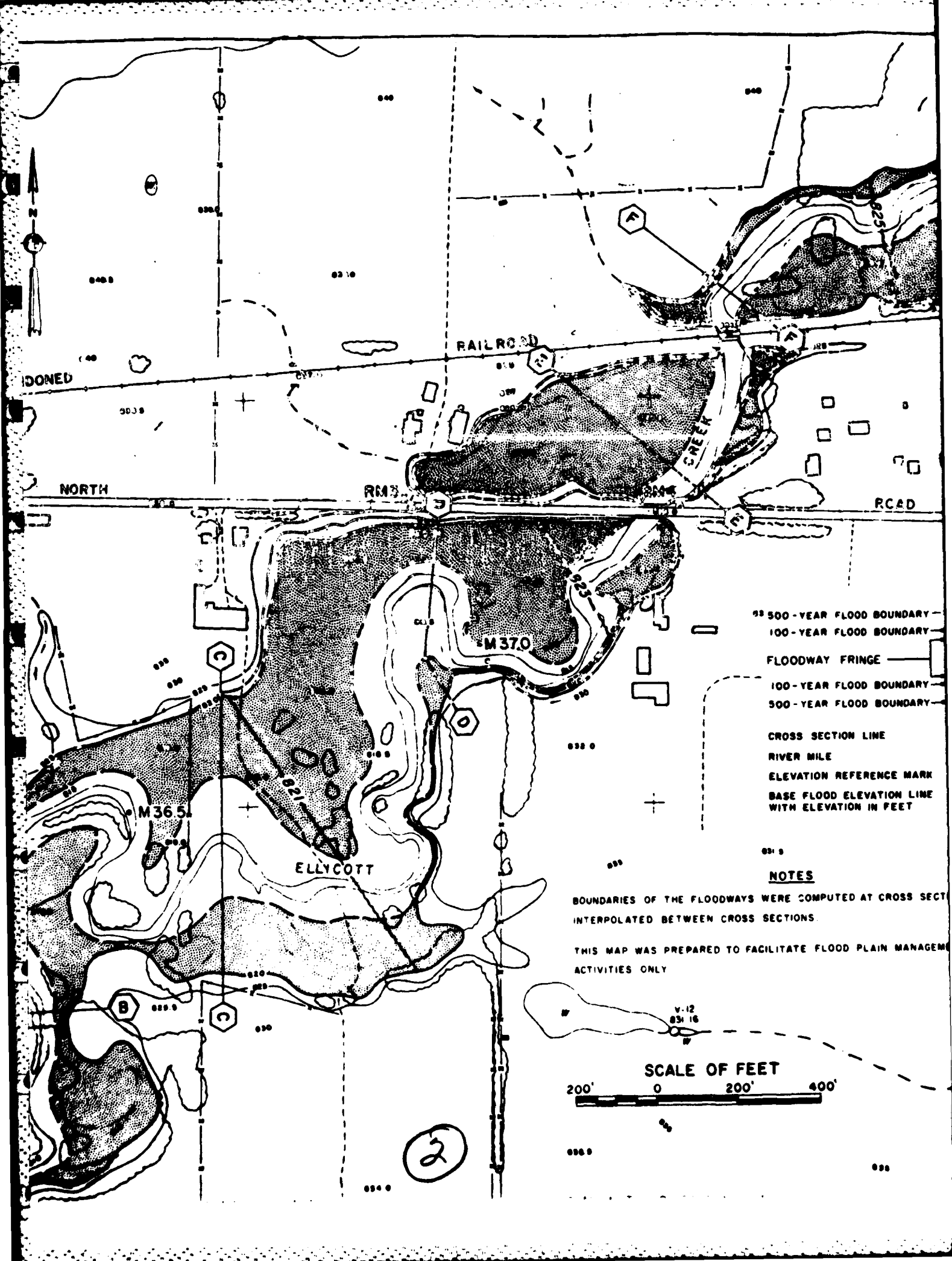
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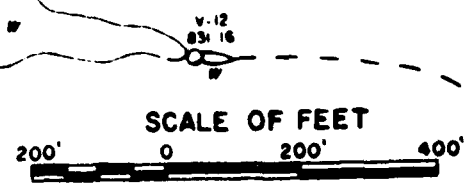


- 500-YEAR FLOOD BOUNDARY
- 100-YEAR FLOOD BOUNDARY
- FLOODWAY FRINGE
- 100-YEAR FLOOD BOUNDARY
- 500-YEAR FLOOD BOUNDARY
- CROSS SECTION LINE
- RIVER MILE
- ELEVATION REFERENCE MARK
- BASE FLOOD ELEVATION LINE WITH ELEVATION IN FEET

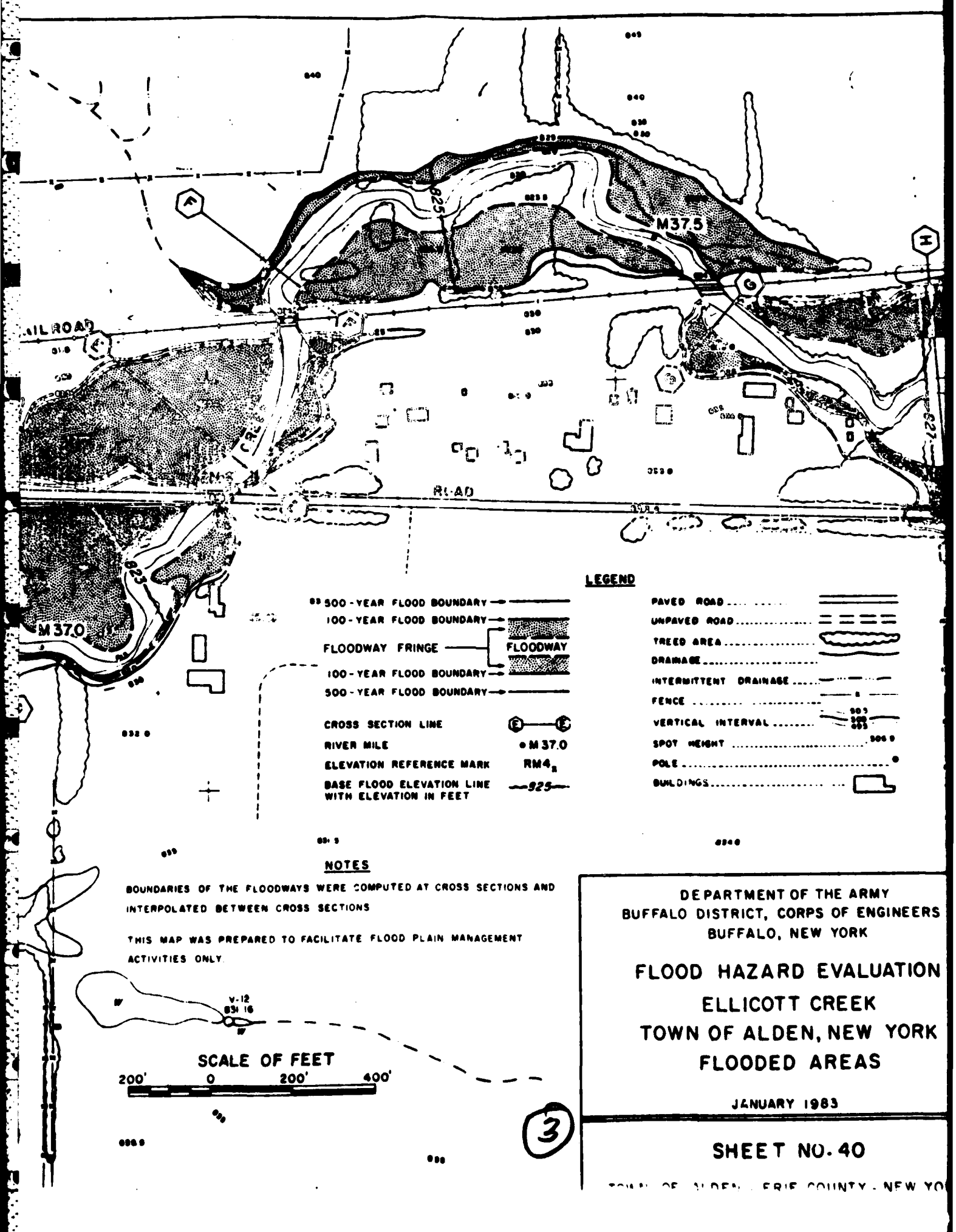
NOTES

BOUNDARIES OF THE FLOODWAYS WERE COMPUTED AT CROSS SECTIONS INTERPOLATED BETWEEN CROSS SECTIONS

THIS MAP WAS PREPARED TO FACILITATE FLOOD PLAIN MANAGEMENT ACTIVITIES ONLY



2



- 500-YEAR FLOOD BOUNDARY
- 100-YEAR FLOOD BOUNDARY
- FLOODWAY FRINGE
- 100-YEAR FLOOD BOUNDARY
- 500-YEAR FLOOD BOUNDARY
- CROSS SECTION LINE
- RIVER MILE
- ELEVATION REFERENCE MARK
- BASE FLOOD ELEVATION LINE WITH ELEVATION IN FEET

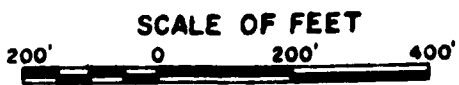
LEGEND

- PAVED ROAD
- UNPAVED ROAD
- TREE AREA
- DRAINAGE
- INTERMITTENT DRAINAGE
- FENCE
- VERTICAL INTERVAL
- SPOT HEIGHT
- POLE
- BUILDINGS

NOTES

BOUNDARIES OF THE FLOODWAYS WERE COMPUTED AT CROSS SECTIONS AND INTERPOLATED BETWEEN CROSS SECTIONS

THIS MAP WAS PREPARED TO FACILITATE FLOOD PLAIN MANAGEMENT ACTIVITIES ONLY.



3

DEPARTMENT OF THE ARMY
 BUFFALO DISTRICT, CORPS OF ENGINEERS
 BUFFALO, NEW YORK

FLOOD HAZARD EVALUATION
 ELLICOTT CREEK
 TOWN OF ALDEN, NEW YORK
 FLOODED AREAS

JANUARY 1983

SHEET NO. 40

TOWN OF ALDEN, ERIE COUNTY, NEW YORK

MATCH LINE



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DOWNSTREAM LIMIT
OF STUDY

CREEK

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RM3

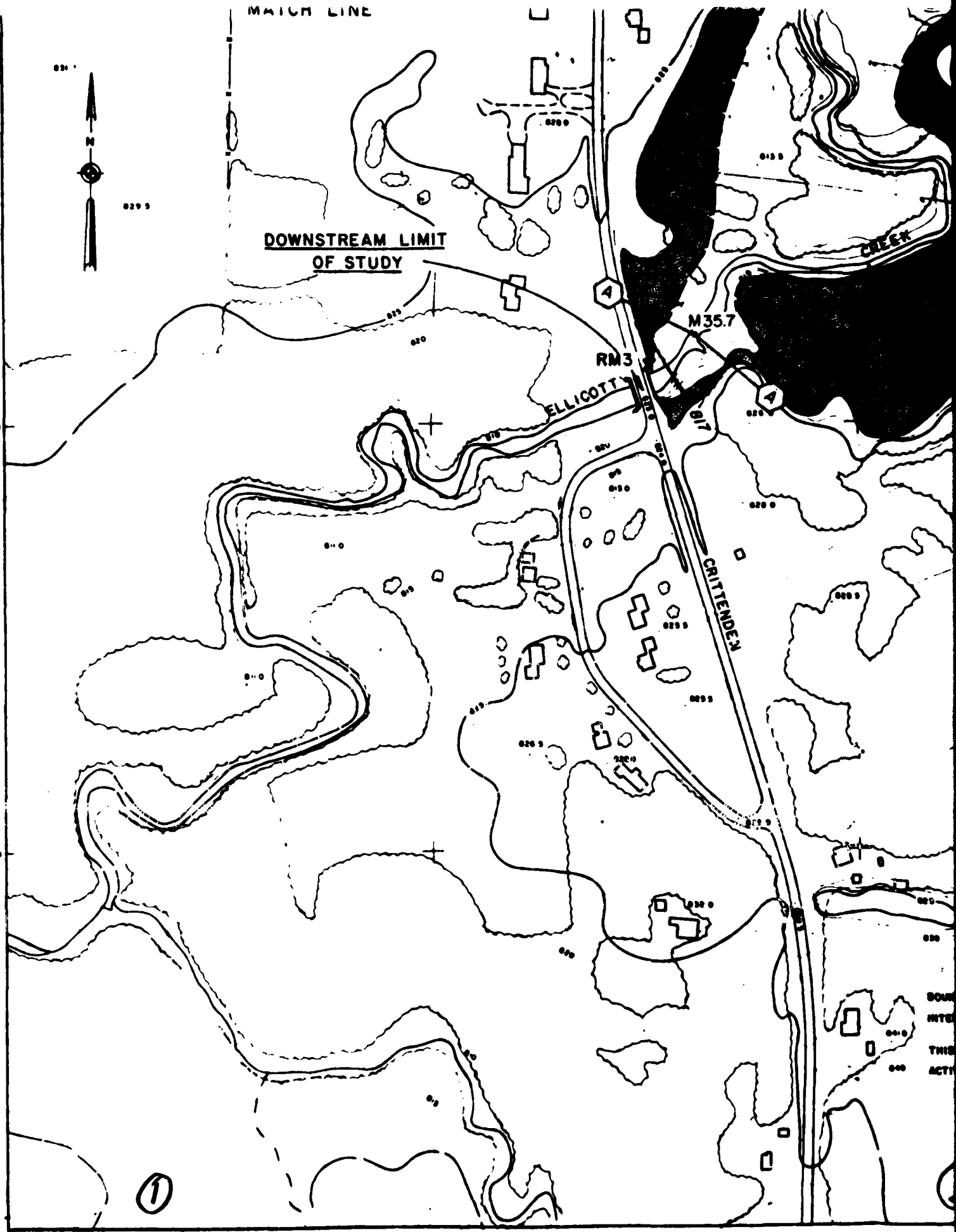
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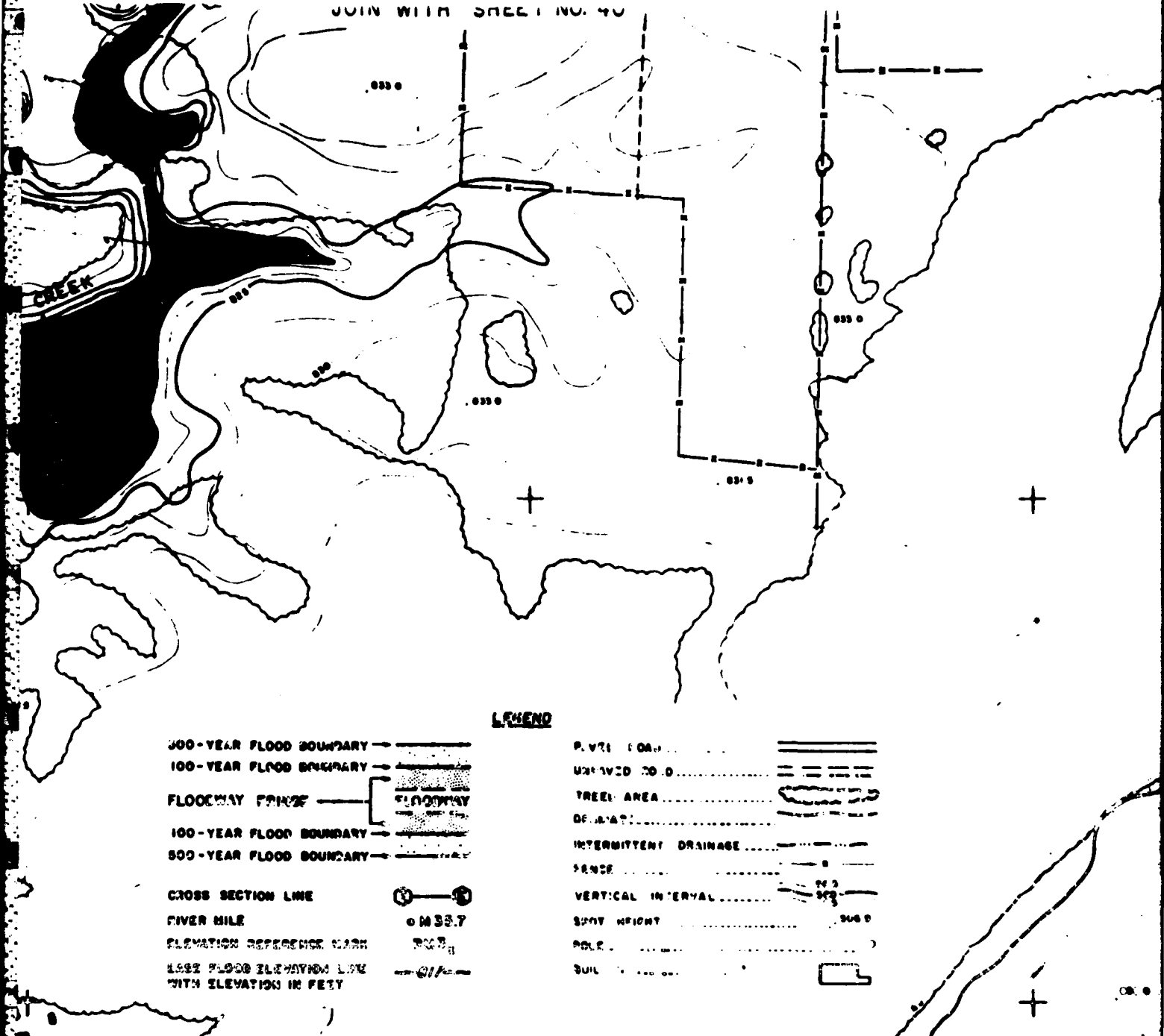
CRITTENDEN

SOUR
INTE
THIS
ACTY

①



JOIN WITH SHEET NO. 40



LEGEND

- 500-YEAR FLOOD BOUNDARY ————
- 100-YEAR FLOOD BOUNDARY ————
- FLOODWAY FRINGE ————
- 100-YEAR FLOOD BOUNDARY ————
- 500-YEAR FLOOD BOUNDARY ————
- CROSS SECTION LINE ————
- FIVER MILE ————
- ELEVATION REFERENCE MARK ————
- LESS FLOOD ELEVATION LINE WITH ELEVATION IN FEET ————

- PLATE LOAD ————
- UNPAVED ROAD ————
- TREE AREA ————
- DEBRIS ————
- INTERMITTENT DRAINAGE ————
- FENCE ————
- VERTICAL INTERVAL ————
- SPOT HEIGHT ————
- POLE ————
- SUI ————

NOTES

BOUNDARIES OF THE FLOODWAYS WERE COMPUTED AT CROSS SECTIONS AND INTERPOLATED BETWEEN CROSS SECTIONS.

THIS MAP WAS PREPARED TO FACILITATE FLOOD PLAIN MANAGEMENT ACTIVITIES ONLY.

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
BUFFALO, NEW YORK

**FLOOD HAZARD EVALUATION
ELLICOTT CREEK
TOWN OF ALDEN, NEW YORK
FLOODED AREAS**

JANUARY 1983

SHEET NO. 41

TOWN OF ALDEN - ERIE COUNTY - NEW YORK



2

MATCH LINE

ABANDONED

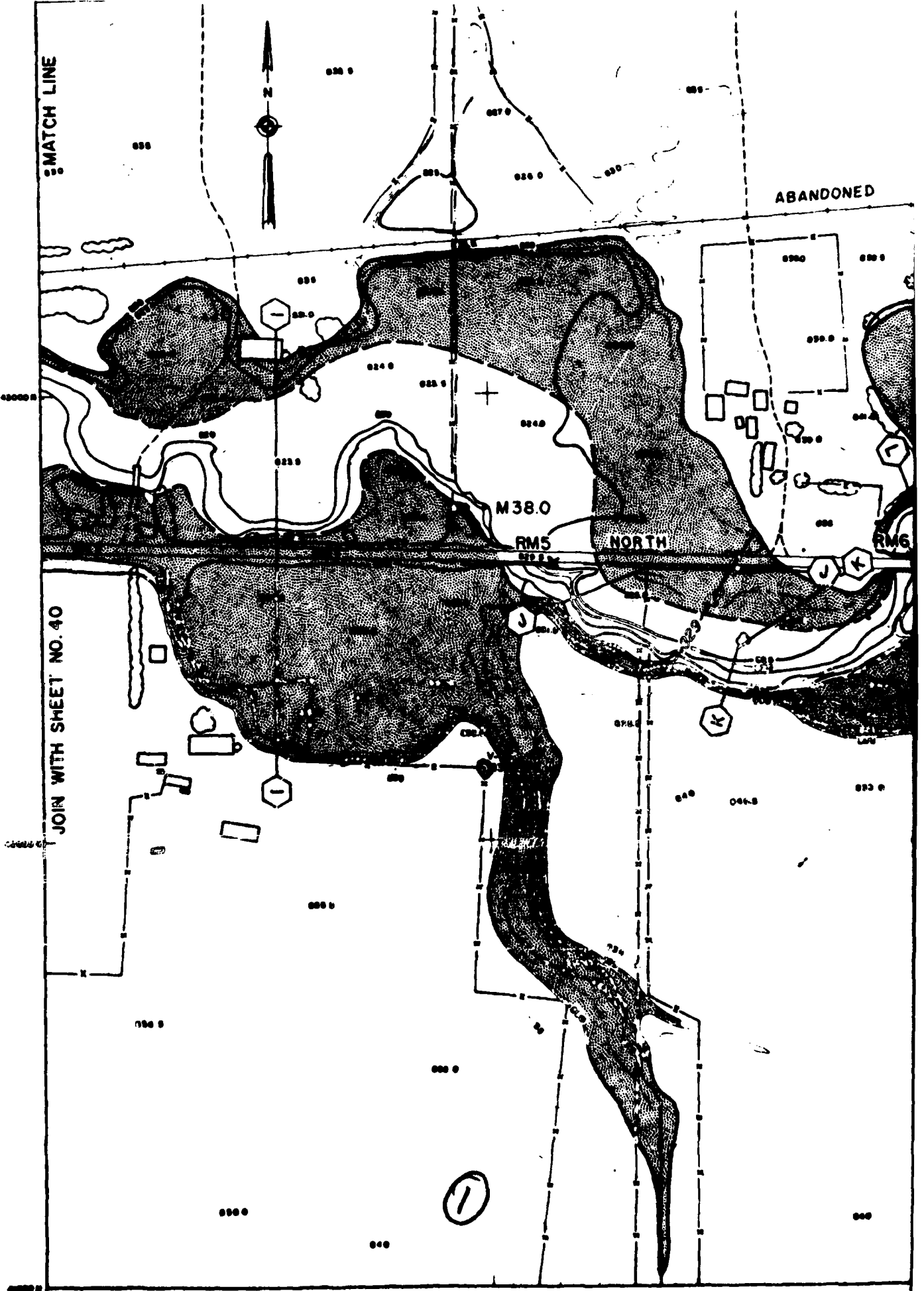
JOIN WITH SHEET NO. 40

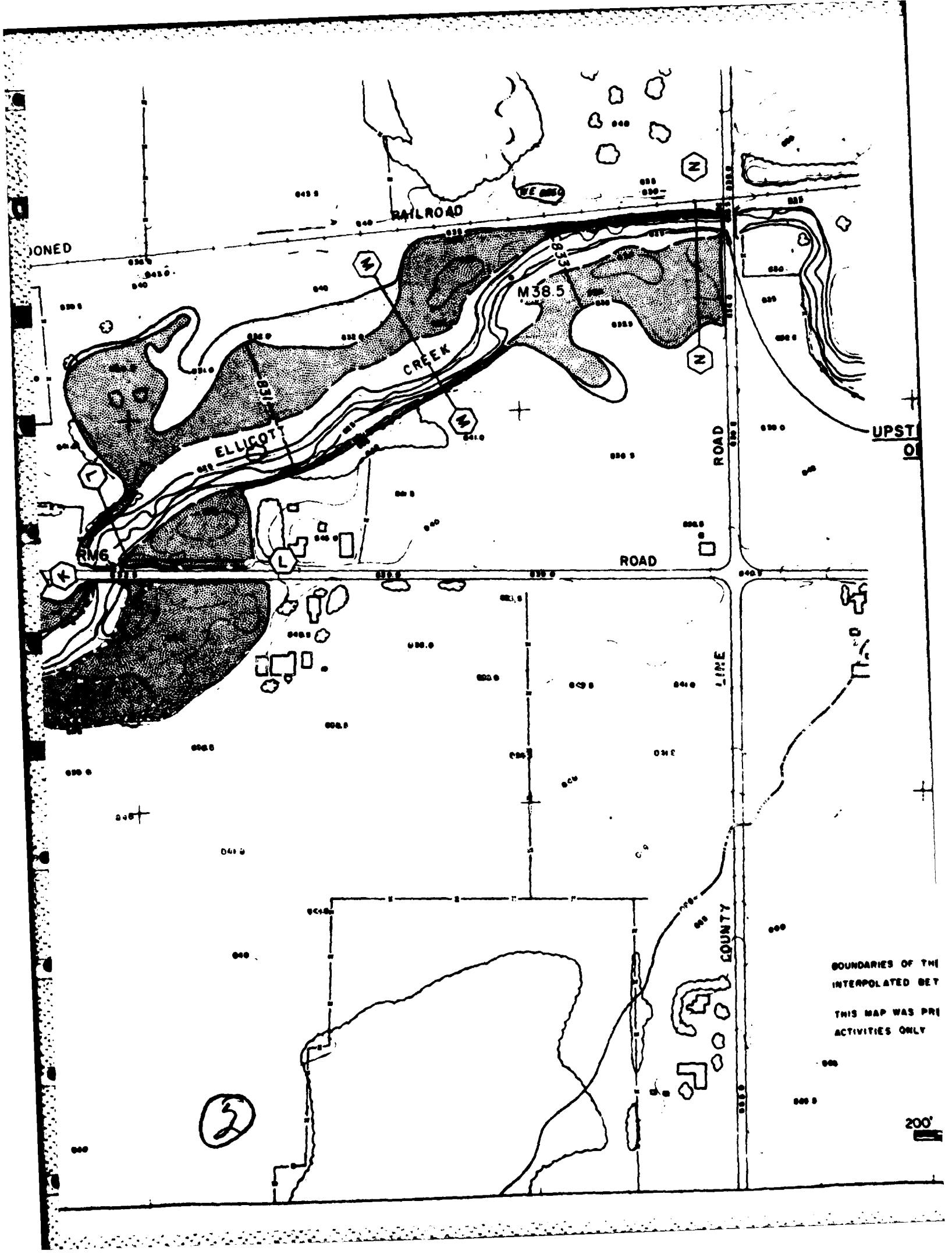
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RMS

NORTH

RM6





BOUNDARIES OF THE
INTERPOLATED SET
THIS MAP WAS PREPARED FOR
ACTIVITIES ONLY

200'

UPSTREAM LIMIT
OF STUDY

LEGEND

- 500-YEAR FLOOD BOUNDARY ————
- 100-YEAR FLOOD BOUNDARY ————
- FLOODWAY FRINGE ————
- 100-YEAR FLOOD BOUNDARY ————
- 500-YEAR FLOOD BOUNDARY ————
- CROSS SECTION LINE ————
- RIVER MILE ————
- ELEVATION REFERENCE MARK ————
- BASE FLOOD ELEVATION LINE WITH ELEVATION IN FEET ————

- PAVED ROAD ————
- UNPAVED ROAD ————
- TREED AREA ————
- DITCHES ————
- INTERMITTENT DRAINAGE ————
- FENCE ————
- VERTICAL INTERVAL ————
- SPOT HEIGHT ————
- POLE ————
- BUILDINGS ————

NOTES

BOUNDARIES OF THE FLOODWAYS WERE COMPUTED AT CROSS SECTIONS AND INTERPOLATED BETWEEN CROSS SECTIONS

THIS MAP WAS PREPARED TO FACILITATE FLOOD PLAIN MANAGEMENT ACTIVITIES ONLY



3

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
BUFFALO, NEW YORK

**FLOOD HAZARD EVALUATION
ELLICOTT CREEK
TOWN OF ALDEN, NEW YORK
FLOODED AREAS**

JANUARY 1983

SHEET NO. 49

TOWN OF ALDEN - ERIE COUNTY - NEW YORK

END

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