Detailed Project Report

(4)

Limestone Creek

Local Flood Protection
Fayetteville, New York

FINAL

Main Report And Environmental Impact Statement

US Army Corps of Engineers
Buffalo District

August 1990

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Fayetteville is a small village located in the lower portion of the Limestone Creek drainage Basin. Both residential and commercial developments are subject to periodic flooding. Expected average annual damages are $701,800. The selected plan provides protection from floods having a probability of occurrance of once in 100-years. The structural features of the plan are 3,650 feet of levee, 600 feet of concrete flood wall, about 325 feet of berm, and 25,000 square feet of riprap.

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Syllabus

The Commander of the Buffalo Engineer District finds a need for the construction of flood protection measures in the village of Fayetteville, NY.

Fayetteville is a small village located in the lower portion of the Limestone Creek drainage basin. Both residential and commercial developments are subject to periodic flooding. Expected average annual damages are $701,800.

The selected plan provides protection from floods having a probability of occurance of once in 100-years. The structural features of the plan are 3,650 feet of levee, 600 feet of concrete flood wall, about 325 feet of berm, and about 24,000 square yards of riprap.

Construction of the project is engineeringly and economically feasible with a benefit-to-cost ratio of 2.38. The first cost of construction is estimated to be $2,370,000 of which $592,500 would be the responsibility of the non-Federal sponsor at February 1987 price levels. With incorporation of various environmental design considerations and measures, adverse environmental impacts will be minimal with the Selected Plan.

Construction of this flood protection project is strongly supported by the non-Federal sponsor.

Rev. 8/90

DETAILED PROJECT REPORT
LIMESTONE CREEK AT
FAYETTEVILLE, NY

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Introduction

This section introduces the reader to the Limestone Creek at Fayetteville, NY, Small Flood Protection Study and explains the content and organization of the report, along with providing the reader with some background on the study.

A map showing the study area of Fayetteville is shown as Figure 1 on the following page.

PURPOSE AND AUTHORITY

This report presents the results of our investigation of the flooding problems in the village of Fayetteville, NY.

The study was undertaken in response to a letter dated 23 October 1980 from James Lannon, Mayor, village of Fayetteville, in which he asked the Corps to conduct a study of the flooding problem within the village of Fayetteville. The study was carried out under Small Flood Control Authority delegated to the Secretary of Army by Section 205 of the Flood Control Act of 1948, as amended.

SCOPE OF STUDY

The 1981 Reconnaissance Report identified overbank flooding as the principal problem in the Fayetteville area. Although overbank flooding occurs frequently in the downstream reaches of Limestone Creek, this study has concentrated on the village of Fayetteville because of the intensity of development in that area.

STUDY PARTICIPANTS AND COORDINATION

Participation in this study by other governmental and public entities was encouraged through correspondence, telephone calls, and personal visits. Direct coordination was maintained throughout the study with many agencies including: village of Fayetteville, New York State Department of Environmental Conservation, and U.S. Fish and Wildlife Service. In addition to this coordination most of the citizens living in the flood plain were invited to participate in the study. We conducted personal interviews and circulated a newsletter. A summary of pertinent coordination is discussed in PROBLEM IDENTIFICATION, Public Involvement. A more complete discussion of the coordination is contained in the Environmental Impact Statement (EIS), the report copied on colored pages which is attached to this report.

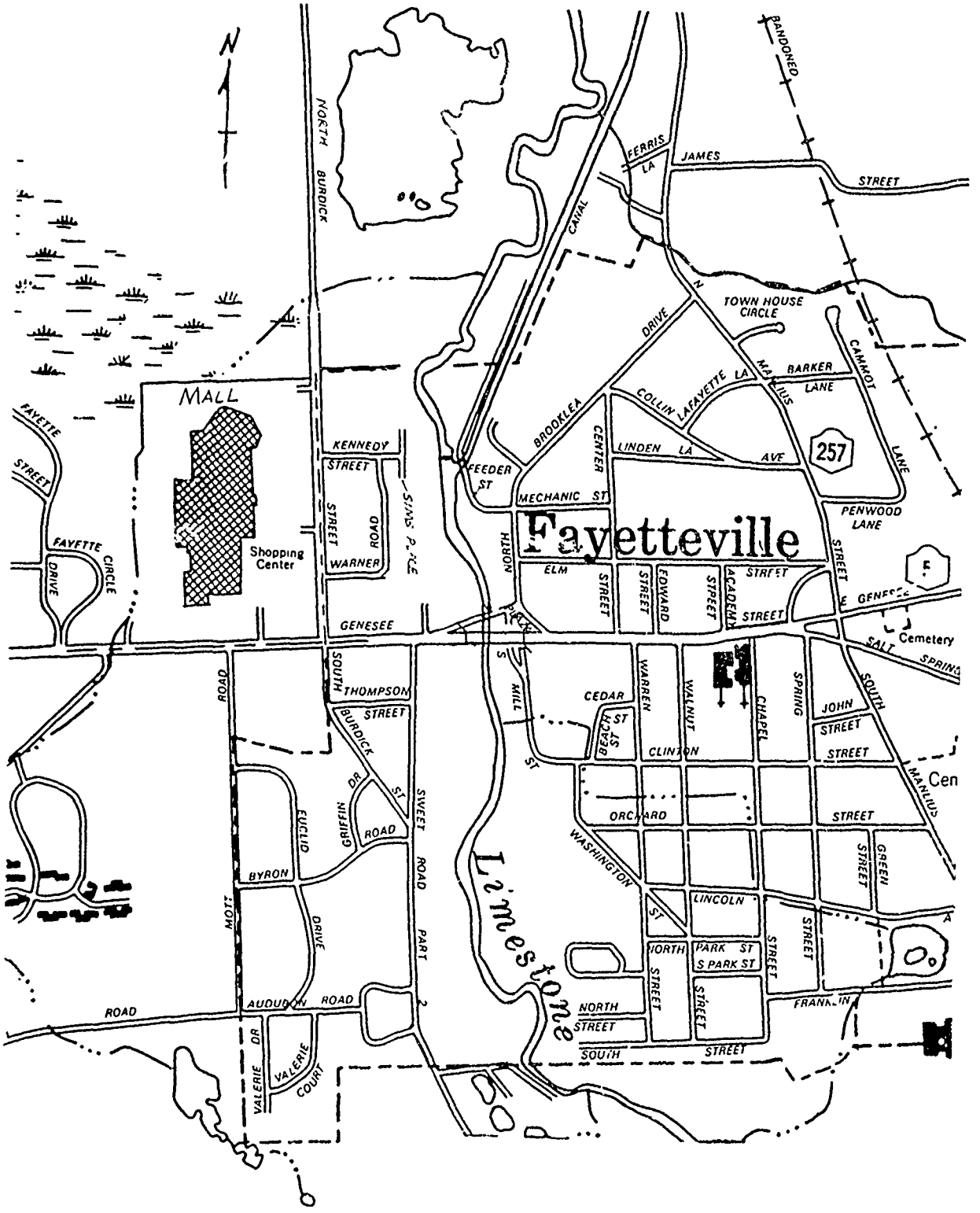


Figure 1. Map of the village of Fayetteville. (Note Limestone Creek flows north thru village).

RELATED STUDIES

Most of the studies conducted or Limestone Creek have concentrated on the entire Chittenango Basin which consists of the Limestone, Butternut, and Chittenango watersheds.

Table 1 is a list of previous reports prepared on Limestone Creek and the Chittenango Basin.

THE REPORT AND STUDY PROCESS

In the interest of clarity, this Detailed Project Report (DPR) has been arranged into a Main Report and four appendices. The Main Report is written to give both the technical reviewer and the general reader a clear understanding of the study, the study results, and the key conclusions and decisions reached. It includes a discussion of the resources and economy of the study area; the problems and needs; the alternatives considered; social and environmental implications of the alternatives; and feasible and economically justified improvements. The cost and benefits of the various alternatives and the division of project responsibility between Federal and non-Federal interests in the selected plan are also presented in summary form. The report documents the recommendation of the District Commander.

The EIS (colored pages) contains the results of the environmental studies and the effect the proposed plan will have on the human and natural environment.

The four appendices present supporting data and details covering the information of the Main Report. They are not part of the Main Report but are described here for general information. Appendix A is a technical report of the hydraulic and hydrologic investigation. Appendix B is a technical report of the economic evaluation. Appendix C is a technical report of the detailed geotechnical and structual design. Appendix D is a compilation of pertinent correspondence.

The study process consisted of the following major steps: identify water resource problems and needs in the study area; inventory, forecast and analyze conditions related to the identified problems; develop alternatives and evaluate them; compare the alternatives and then select a recommended plan.

NATIONAL POLICIES

The Water Resources Council's (WRC) Principles and Guidelines direct that Federally assisted water related land planning be directed to achieve National Economic Development (NED) as a National Objective. NED is to be achieved by increasing the value of the nation's output of goods and services. In addition to this national objective, the President, in a message to Congress on 6 June 1978, directed that the national water policy should be improved by "requiring the explicit formulation and consideration of a primary nonstructural plan as one alternative, whenever structural water projects are planned." These national policies are followed throughout the report.

TABLE 1 - RELATED REPORTS

CORPS OF ENGINEERS STUDIES

- Review of Reports for Flood Control on Chittenango Creek and Tributaries, by USAED, Buffalo; February 1967; states possible local and regional flood protection improvements, including reservoirs. It made no favorable recommendation.

- Flood Plain Information Report on Limestone Creek in the Town of Manlius, NY, by USAED, Buffalo; June 1971.

- Reconnaissance Report on Flooding Along Limestone Creek in Fayetteville, NY, by USAED, Buffalo; May 1981; states problems and identifies that there is a Federal interest in flood protection.

STUDIES BY OTHERS

- Oswego River Basin Study, Project Analysis of Reservoirs on Limestone and Butternut Creek, by Bureau of Water Resources Plannings, New York State Department of Environmental Conservation (NYSDEC); June 1971; investigates water supply potential on the two creeks; recommends water supply reservoirs on both creeks with a total yield of 44 MGD.

- Flood Damage Survey for Limestone Creek, by McPhee, Smith, and Rosenstein, Engineers for the Corps; April 1980. This report provided the basic data for computation of average annual damage potential on Limestone Creek in Fayetteville.

- Flood Insurance Study; Limestone Creek, by the Federal Insurance Administration, April 1985; develops flood profiles for Limestone Creek.

Problem Identification

The purpose of this section is to describe the water-related resource problems and needs, which are pertinent to this study. The section presents information on the existing physical, human, and biolcgical environment; presents the most likely future that would exist without the project; and presents the planning objectives developed for the study. This section is intended to provide a summary of the problems and needs criticial to plan formulation. For a more detailed discussion of the problems and needs, consult the EIS (colored pages).

EXISTING CONDITIONS

The EIS contains a detailed discussion of the existing conditions. Only the factors that significantly influenced plan formulation are presented below:

PHYSICAL RESOURCES

Location - The study area is located in Centr l New York State about 4 miles east of the city of Syracuse, NY, in the village of Fayetteville, on Limestone Creek. Limestone Creek is a tributary of Chittenango Creek within the Oswego Watershed.

Topography - The village of Fayetteville is divided by Limestone Creek. The principal damage area is located on the left (west) overbank (looking downstream). A photograph of this area is shown as Figure 2. The right overbank is generally high ground well above the flood plain. However, the left overbank slopes downward from the creek to the Fayetteville Mall. The geography and topography of the area affects the flow regime of the creek. The creek just South of Fayetteville is generally swift moving with a steep sloping channel. The stream is less rapid as it moves into Fayetteville. The creek flows north through Fayetteville and over the State dam which is a feeder for the State Barge Canal System. Below the State dam, the channel slope is flat and the creek is slow moving.

HUMAN RESOURCES

General - The EIS has a detailed discussion of human resources such as population, land use, employment, and income. While detailed population statistics are presented in Tables 4 and 5 in the EIS, the population of the

village of Fayetteville has remained fairly static over the past 15 years. Its basic character as a village suburb of the city of Syracuse has remained unchanged, although there has been significant commercial development in the village. The completion of the Fayetteville Mall best exemplifies this commercial activity.

Cultural Resources - In May 1983, a cultural resources survey of the area was conducted. No significant historic or prehistoric artifacts were discovered. Additionally, the literature and records search showed no previously reported sites near the proposed project. Based on conversations with local residents, the Barge Canal dam (Figure 3) and feeder canal were considered to be of some local historical note. However, the cultural resources investigations did not identify any historic characteristics that would make the structure eligible for inclusion on the National Register of Historic Places. The dam and diversion canal will not be impacted by the recommended plan.

Recreational Opportunities - Although land use projections do not indicate a significant demand for additional recreational activities, this may change over time. In assessing the recreation potential for Onondaga County, the county found that many kinds of recreational areas and enterprises have a high potential for further development. Of particular interest specific to Limestone Creek is the creek's fisheries and associated fishing potential. Limestone Creek waters are evaluated as being among the top 50 trout streams in New York State. Onondaga County, under a permit from NYSDEC, annually stocks Limestone Creek. The target is to stock 19,500 brown trout yearlings annually. In years when the county's hatchery cannot provide 19,500 brown trout, NYSDEC has allowed up to 20 percent substitution of rainbow trout. Upstream from the study area, NYSDEC and Trout Unlimited have fishing rights along 11 miles of Limestone and its West Branch, with NYSDEC maintaining 14 public access areas.

Community Cohesion - During the study, many people in the flood plain were contacted through correspondence, newsletters, and individual interviews. These people generally expressed a very high desire to remain in the area. The major reasons noted were rural atmosphere, proximity to Syracuse, and the available community services. In addition to the opinions of the individuals contacted, the village of Fayetteville has probably the strictest sign ordinances in the State. This not only demonstrates a very high community cohesion but an equally high respect for property values. The Fayetteville Mall which is located just outside the village complies with this ordinance.

FUTURE WITHOUT PROJECT CONDITION

The Future Without Project Condition is what is expected to occur in the study area if no Federal project is built. This concept is very important because this assumed condition is the starting point for the development of our proposed improvements, and it provides the basis of comparison to determine the impacts and benefits of the selected plan. With the exception of the following points, we expect that the without condition will be very similar to the current conditions of development.

Figure 2. Aerial view of Fayetteville looking north (downstream) on Limestone Creek.

Figure 3. Photos of NYSDOT diversion dam and upstream pool.

Fishery - New York State Department of Environmental Conservation is very committed to the survival of the trout fishery on Limestone Creek. However, the local pressure which would result from additional flooding could force NYSDEC to repeat and possibly expand upon the channelization they accomplished in the summer of 1982 as a result of the 1981 flood. As evidence of this future commitment, NYSDEC obtained maintenance agreements with the local communities requiring them to annually remove shoals or debris jams from the creek. Since Fayetteville sits at the downstream limit of the trout fishery, we expect the fishery would survive any such channelization within the village. (Trout were seen in the channelized areas soon after the 1982 work was completed.)

Wetlands - NYSDEC is also heavily committed to the preservation of wetlands. However, local development pressure has been so strong that developers are still filling in wetlands. Although this pressure is expected to grow, the development of wetlands in the State will become more and more difficult. The wetland adjacent to the Fayetteville Mall is expected to experience this same pressure although we assume, that other than encroachments, it will continue to survive without the project.

PROBLEMS, NEEDS, AND OPPORTUNITIES

Flooding - In 1980, an estimated 120 residential, 20 multi-family, 52 commercial (including the Mall), two industrial, and two public structures occupied the Limestone Creek flood plain and Fayetteville. The majority of the flood damage is to commercial properties. The most recent flood in October 1981 came within 6 inches of flooding the first floor of the Fayetteville Mall (Figure 4). This storm was estimated to have a recurrence interval of about once in 25-years. Flooding in Fayetteville occurs in two ways. In the reach downstream from the New York State Department of Transportation (NYSDOT) diversion dam the water backs up and floods the streets of Sims, Kennedy and Warner. For high discharges, such as the 1981 flood (Figures 5, 6, and 7), the water breaks through the low levees on the upstream left bank and flows through the town houses, across Route 5 and into the Mall, North Burdick, Kennedy, Warner Roads and Sims Place. Once the water breaks out of Limestone Creek, it flows down through the village independent of the water flowing in the channel. This caused several problems with the flood modeling because the water surface elevations are as much as 2 feet lower in the overbank than the main channel, for the same flood event.

Trout Fishery - The existence of a trout fishery within the village and its associated green belt was identified as a significant resource to the community. Therefore, we developed a planning objective to address this.

Cultural Resources - Although the NYSDOT diversion dam was not identified as an historical site, it was our feeling that it could be important to the local community in the future and should be maintained. In addition, the water it diverted to the NYS Barge Canal had to be maintained. Therefore, we developed a planning objective to address this.

Public Involvement - Participation in this study by other governmental and public entities was encouraged through telephone conversations, interviews, and personal visits. In addition to our contacts, the Mayor of the

village surveyed most of the residents in the flood plain to get their opinions on the problems and possible solutions. The mayor also distributed a newsletter describing the proposed plan and asked for comments. In addition to the village, we also coordinated with both NYSDEC and NYSDOT.

PLANNING OBJECTIVES

Problem and Opportunity Statements - Based on the previous sections, the following planning objectives were developed. Each objective is for the 1988 to 2038 planning period on Limestone Creek.

a. To reduce damages which result from periodic flooding in the village of Fayetteville.

b. To preserve cultural resources which would contribute to the heritage of the town of Manlius, Onondaga County, or the State of New York.

c. To preserve, protect, or enhance the quality of fish and wildlife where possible in the village of Fayetteville, NY.

d. To reduce the potential for impacts to health and safety from flooding in the village of Fayetteville.

e. To preserve or enhance the fishing access in the village of Fayetteville.

f. To encourage future land use practices consistent with National Flood Insurance and Flood Plain Management Practices.

Planning Constraints - During this study, planning constraints were identified concerning site location, water diversion, and environmental aspects. Each constraint is described in subsequent paragraphs.

a. Site Location - The authority for this study focuses on the village of Fayetteville.

b. Water Diversion - The NYSDOT Dam near the downstream village boundary serves as a diversion dam for the New York State Barge Canal. This diversion would have to be maintained under all proposed improvements.

c. Environmental Concerns - The desire to protect valuable wetlands from unnecessary destruction is emphasized by a variety of laws and guidelines. A planning constraint which ensures compliance with appropriate wetland protection stipulations is iterated in response to the public concern for these unique wildlife areas.

Figure 4. Photo of flooding in Fayetteville Mall during 1981 flood.

Figure 5. Photo of flooding on Kennedy and Warner Roads during 1981 flood.

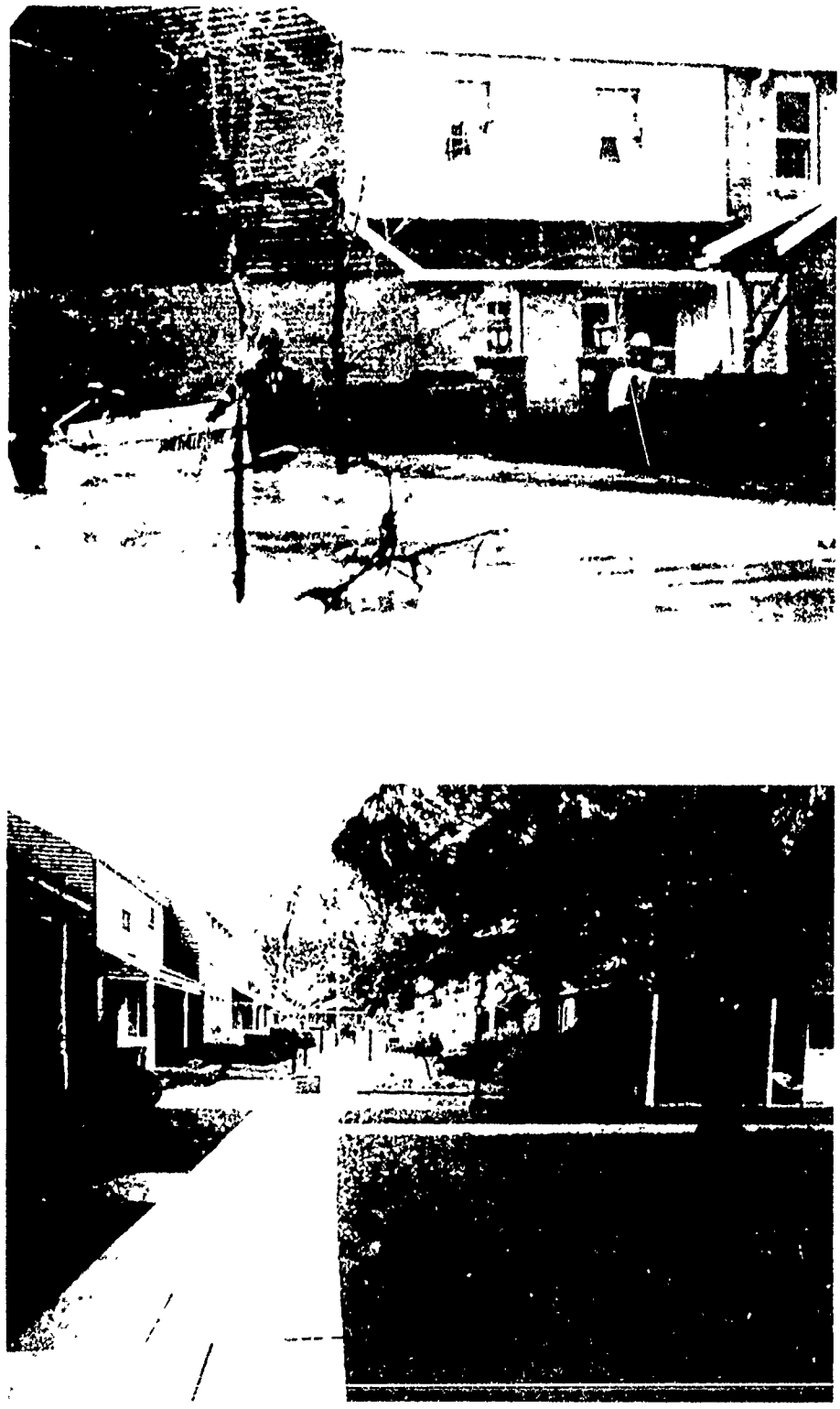


Figure 6. Photos show condition of development during and after 1981 flood.

Figure 7. Photos show condition of development during and after 1981 flood.

Plan Formulation

The objective of this section is to develop and select a plan to reduce the flooding problems in the village of Fayetteville based on the objectives stated in the previous section. To do this we used an iterative process consisting of three iterations. They were:

a. Develop a range of possible alternatives.

b. Screen the alternatives with regard to the planning objectives.

c. Optimize the best plan from Step 2.

EVALUATION CRITERIA

Plans must be formulated to meet the needs of the area with due regard to benefits and costs, both tangible and intangible, and effects on the ecology and social well-being of the community.

Within the overall planning framework are other more specific criteria relative to policies, technical engineering, economic principles, social and environmental values, and local conditions. These criteria, noted as "Technical," "Economic," and "Socioeconomic and Environmental" are discussed below. The National Policies were discussed in the Introduction and are not repeated here.

Technical - The Corps of Engineers has numerous technical criteria that apply to flood control studies. Two such criteria that are pertinent to this study are our requirement to assure that when the flood protection measures are exceeded that we have not created a catastropic situation that increases the potential for the loss of life, and that the flood protection measures when exceeded, continue to perform at least as well as if there had been no project built. Both of these criteria are particularly important whenever we consider levee protection.

Economic Criteria

a. Tangible benefits should exceed project costs.

b. Each separable unit of improvement or purpose should provide benefits at least equal to its cost unless justifiable on a noneconomic basis.

c. Each plan, as ultimately formulated, should provide the maximum net benefits possible within the formulation framework.

d. The benefits and costs should be in comparable economic terms to the fullest extent possible.

e. A 50-year economic life and 8-7/8 percent discount rate are used for the economic evaluation.

f. The base case for comparison of alternative plans is the condition that is expected to exist without any Federal action.

Socioeconomic and Environmental Criteria - The criteria for socioeconomic and environmental consideration in water resource planning are prescribed by Section 102 of the National Environmental Policy Act of 1969 (PL 91-190) and Section 122 of the River and Harbor Act of 1970 (PL 91-611). These criteria prescribe that all significant adverse and beneficial economic, social, and environmental effects of planned developments be considered and evaluated during plan formulation. In addition, Executive Order 11990, dated 24 May 1977, directs that each agency shall provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enchance the natural and beneficial values of wetlands. Executive Order 11988, Flood Plain Management, discourages Federal agencies from undertaking projects in a flood plain or that would encourage development in a flood plain. The National Historic Preservation Act and the Archeological and Historic Preservation Act prescribe cultural resources requirements.

DEVELOPMENT OF ALTERNATIVE MEASURES

An interdisciplinary team was used to develop a reasonable range of schemes, based on the information in the "PROBLEM IDENTIFICATION" section of this report. A complete mix of structural and non-structural schemes were considered. A brief summary of each scheme is presented in the subsequent paragraphs. If you would prefer to skip directly to the preferred plan, go to the paragraph titled "PLAN OPTIMIZATION", on page 19.

Preliminary Schemes Considered - The following is a summary of the preliminary schemes considered by the study team. A map of the study area is shown as Figure 8 on the following page and can be referenced when reading the plans. The orientation for left and right bank is looking downstream or from bottom to top on the map.

Scheme 1 - Levees - This scheme consisted of levees along the entire left bank with concrete walls protecting the commercial and industrial facilities on the right bank and with berms protecting other areas on the right bank. The levees were intended to be set back with little or no channelization.

Scheme 2 - Channelization and Levees - This scheme was similar to Scheme 1 except that the creek would be channelized to reduce the height of the levees. This plan would probably impact on NYSDOT diversion dam.

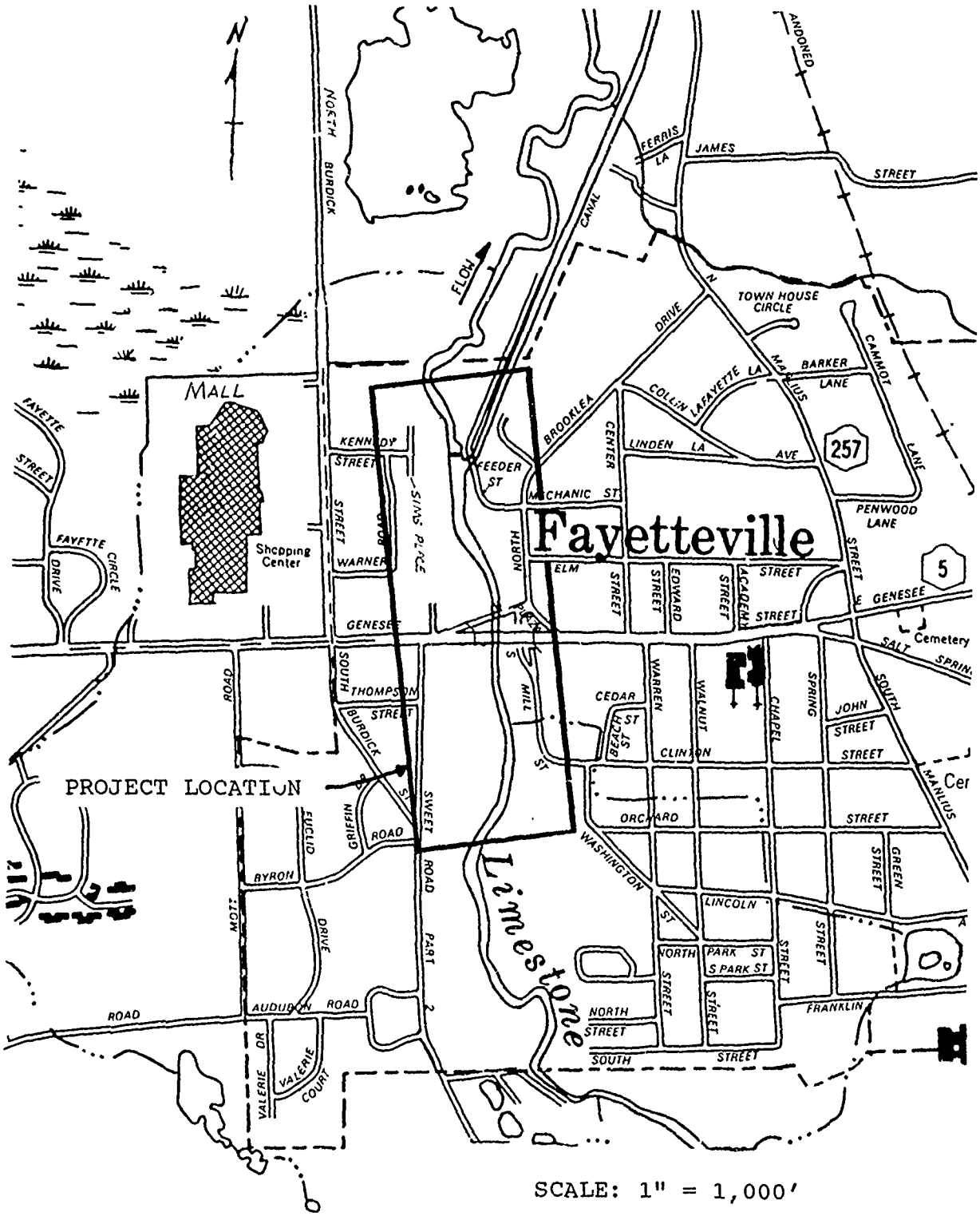


Figure 8. Map of Fayetteville Study Area.

Scheme 3 - Channelization - This scheme entailed extensive channelization to pass the flood waters through Fayetteville. This would have required altering the NYSDOT diversion dam.

Scheme 4 - Levee and Non-Structural - This scheme provided levee and concrete floodwall protection upstream of the Route 5 bridge and relied on flood proofing and permanent evacuation of the residents downstream of the Route 5 bridge.

Scheme 5 - Non-Structural - This scheme consisted of a combination of a flood proofing, evacuation and flood warning.

COMPARISON OF ALTERNATIVE MEASURES

Method - The five schemes were compared as to their success in fulfilling the planning objectives. The impact of the plans is measured by comparing their consequences on the four accounts: Other Social Effects, National Economic Development, Regional Development, and Environmental Quality when compared to what is expected to exist if no Federal flood protection project is constructed.

Based on our preliminary analysis, we determined all the schemes except Scheme 5 could perform well regarding the NED account. Therefore, Scheme 5 was eliminated and the primary selection criteria for the preliminary screening of Schemes 1, 2, 3 and 4 were based on other factors.

Schemes 1 and 4 (with minimal environmental measures) would have no significant long term negative impact on the environment; whereas the channelization in Schemes 2 and 3 would alter or destroy the NYSDOT dam and destroy a significant amount of benthic habitat. Regional economic development would be aided by the structural measures in Schemes 1, 2, and 3. Relocation of large numbers of residents would create considerable community and social disruption. Relocation of businesses would cause hardships because of non-reimbursable production losses. These losses would at least offset the regional benefits from the reduced flooding damages effected by Scheme 4. The study team concluded that Scheme 1 was the only plan which combined maximum NED benefits, environmental impacts which, when mitigated, were not significant, and positive regional economic developments. Scheme 1 was also the scheme most acceptable to the non-Federal interests involved.

Results - Based on this analysis, it was the opinion of the team that Scheme 1, the all levee plan, offered the best potential solution to Fayetteville's flooding problems (Plate 1). This scheme was then evaluated in more detail to see if it could provide a reasonable level of protection. Based on this detailed analysis, we decided that this all levee plan could be designed to provide a sufficient range of protection, that no additional structural measures were necessary and that it was still an efficient solution to the flooding problems at Fayetteville. This and the potential "no-action" alternative were considered most feasible and were considered for further detailed analysis. For more information, reference the following: PLAN OPTIMIZATION (Main Report) page 19, and SECTION 2 - ALTERNATIVES and TABLE TEXT 2 - Comparative Impacts of Alternative Plans on pages 9a, 9b, 10a, 10b, 11a, and 11b of the EIS.

PLAN OPTIMIZATION

After selecting Scheme 1 (Plate 1), the levee plan, the next step was to select the level of protection to which the levees would be designed. This was done by evaluating three levels of protection (50,100 and 500-year) and developing preliminary cost estimates for each. The relative accuracy of these estimates is intended to define the relationship between the Cost and Benefit Curves for the purpose of identifying the area of the maximum difference between the two curves. The results of this analysis are presented in graphical form in Figure 9 on the following page. The level of protection is maximized at the point that has the maximum difference between benefits and costs. Based on this analysis, a 100-year design was selected.

In addition to optimizing the plan, we traditionally analyze separable sections of a plan independently. This is done to insure each section of the plan is justified. On the Fayetteville Study, this would mean that we would consider the protection for the left bank and right banks separately. However, because we have assumed ... in the absence of a Federal project, large floods will continue to breach the levees on the upstream left bank, and bypass the main channel, without the project we do not expect the volume of water going down the stream to change significantly with higher discharges. The increased discharges would mostly raise flooding in the overbank. Based on this without condition, the protection on the right bank is being provided to mitigate the higher stages that will occur as a result of keeping all the flow within the creek.

A more detailed analysis of the proposed plan was conducted to evaluate the individual plan components at the 100-year level of protection. Based on this analysis, we determined that the proposed tieback levee was not incrementally justified as the water that would back around the levee into Sims Place and Kennedy Street would cause only street and yard flooding with no serious residential damages (Plate 2). This has the further advantages of providing a gradual warning that the project is reaching design discharge and of reducing any chance of catastrophic failure. It also simplifies internal flood control and eliminates a relatively expensive tieback levee without any significant loss in flood protection.

Plates 3 and 4 at the end of this report show the flooded areas for the 100-year flood with and without protection.

After eliminating the tie-back levee, we reexamined our plan optimization to assure the proposed level of protection was not affected. The 100-year water surface is the maximum flood event that can be passed without damage to structures or contents without tying the levee to high ground. Therefore, we concluded that this was the maximized plan.

We also compared the cost of the concrete floodwall on the right bank with the cost of relocating either or both of the two businesses located on the right bank, the Onondaga Tool Company and the Stack Animal Hospital. The costs of relocation include acquisition of buildings and lands, moving costs,

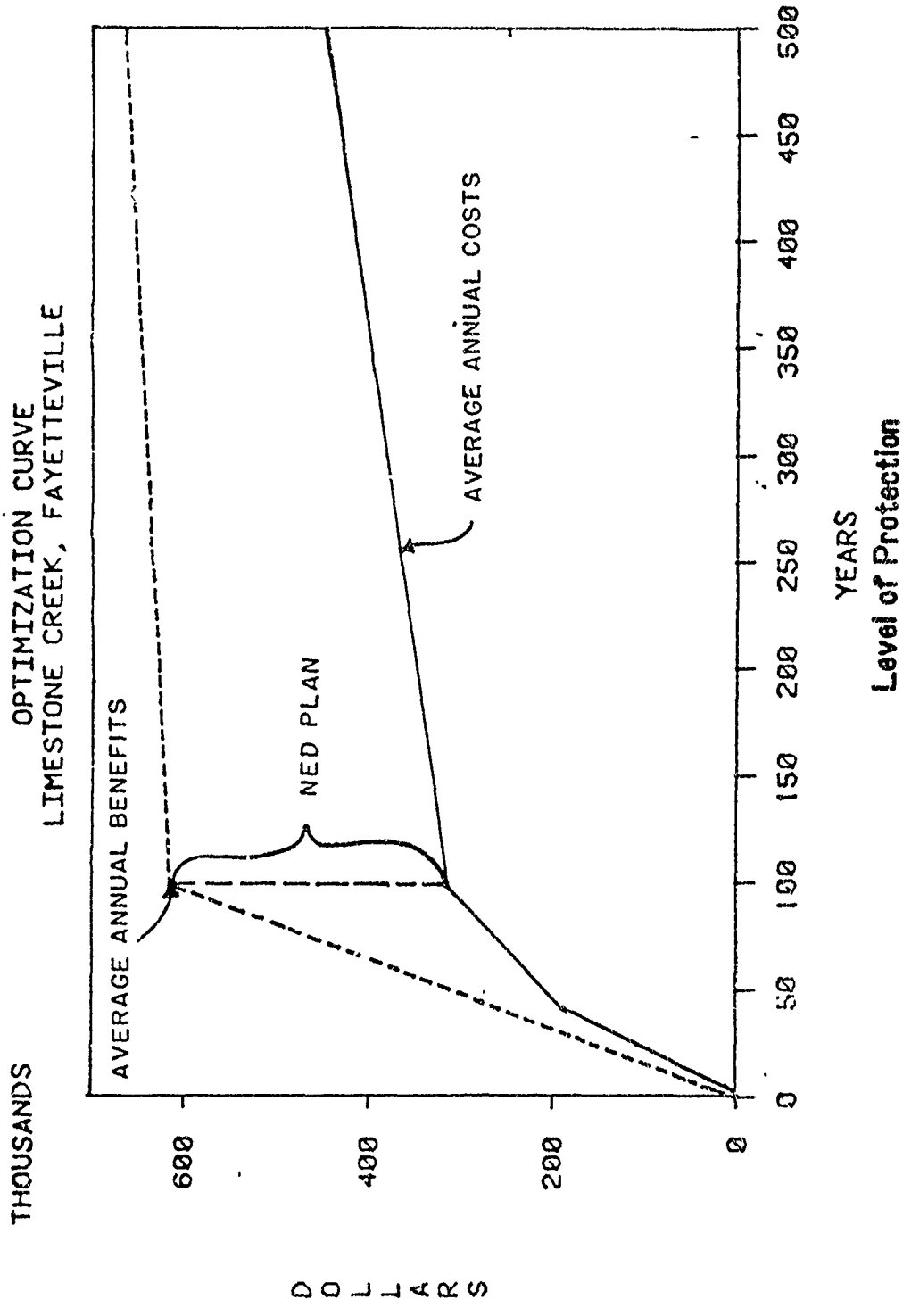


Figure 9. Optimization Curve.

and the costs of lost production during the time of the move. Table 2 compares the costs of:

° protecting both businesses with a floodwall

° protecting Onondaga Tool with a floodwall, and relocating the Stack Animal Hospital

° protecting the Stack Animal Hospital with a floodwall and relocating Onondaga Tool

° relocating both businesses

Based on this comparison, it is more cost effective to protect rather than relocate the two businesses.

Table 2 - Costs of Right Bank Alternatives

Relocate / Protect	0, S(1)	S / 0	0 / S	0, S
Floodwall Length	600 ft.	510 ft.	480 ft.	0
Structural Costs (2)	$360,000	$340,000	$290,000	0
Aquisition Costs (3)	1,000	70,000	210,000	$280,000
Lost Production Costs (4)	0	50,000	110,000	$160,000
Moving Costs (4)	0	4,000	150,000	154,000
Total Costs	$361,000	$464,000	$760,000	$594,000

(1) 0 - Onondaga Tool Corporation
S - Stack Animal Hospital

(2) Including floodwall costs and other structural costs, such as regrading and resurfacing necessary to relocate access to the protected property. A contingency of +20% has been added to all costs.

(3) Estimates of value by town of Manlius Assessor.

(4) Estimates provided by the company involved. All costs and estimates provided by others were reviewed to assure the figures provided are reasonable.

Selected Plan

The Selected Plan, a combination of setback levees and a floodwall is shown on Plate 2 at the end of this report. A detailed estimate of this plan was prepared and is shown in Table 3 on the following page. Appendix C contains detailed drawings of the plan.

PLAN COMPONENTS

The structural features of the plan consist of 3,650 feet of levee, 600 feet of concrete flood wall and two small berms totaling 325 feet in length. The levees are from 2 to 12 feet high, while the floodwall is a maximum of 10 feet high. The levee will require riprap on the creek side over its entire length. Riprap will also be placed at the base of the concrete wall and on both banks downstream of the dam.

The nonstructural features of the plan include evacuation of three residences and the acquisition of the village activity center.

MAINTENANCE

The effectiveness of the Selected Plan will diminish with time unless the project is properly maintained. Expected maintenance includes:

- Replacement or repair as needed of project features including concrete floodwalls, levees, riprap, steel sheet piling and drainage structures.

- Dredging necessary to preserve design channel specifications. Rapid sedimentation in the project area could occur after significant flooding events.

- Maintenance of project vegetation.

All maintenance is the responsibility of the local cooperator. See the Items of Local Cooperation in the "RECOMMENDATIONS" Section of this report. Maintenance costs are shown in Table 5.

REAL ESTATE REQUIREMENTS

Table 4 shows the real estate requirements for the recommended plan.

Table 3 - Cost Estimate for Selected Plan
(February 1987 Price Levels)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
1	Land Easements, ROW & Relocations	-	LS	-	177,000
2	Excavation				
	a. Channel	22,340	CY	7.80	174,252
	b. Structural	360	CY	3.55	1,278
	Total Rounded				176,000
3	Fill				
	a. Random	16,425	CY	2.60	42,705
	b. Impervious	12,879	CY	10.50	135,230
	Total Rounded				178,000
4	Riprap				
	a. 12" Riprap	3,640	SY	17.55	63,882
	b. 18" Riprap	8,410	SY	28.10	236,321
	c. 27" Riprap	4,300	SY	43.90	188,770
	d. 33" Riprap	1,950	SY	48.50	94,575
	Total Rounded				584,000
5	Bedding				
	a. 6" Bedding	630	CY	32.80	20,664
	b. 8" Bedding	1,565	CY	32.80	51,332
	c. 12" Bedding	775	CY	32.80	25,420
	d. 15" Bedding	875	CY	32.80	28,700
	Total Rounded				126,000
6	Steel Sheet Piling				
	a. PZ-27 SSP	21,080	SF	12.85	270,878
	Total Rounded				271,000
7	Concrete & Reinforcment				
	a. Concrete	300	CY	360.00	108,000
	b. Reinforcment (costs included under 7a.)	9,500			
	c. Cover Plate	706	LF	10.40	7,342
	d. Misc. Steel	9,500	lbs	1.00	9,500
	e. Backfill	190	CY	4.10	779
	Total Rounded				126,000
8	Drainage Structure				
	a. 12" CMP	85	LF	11.25	956
	b. Concrete	6	CY	360.00	2,160
	c. Reinforcment (costs included under 8b.)	620	lbs		
	d. Flapgate		LS		2,400
	Total Rounded				5,000
9	Site Preparation				
	a. Clearing & Grubbing	6.75	AC	3,200.00	21,600
	b. Stripping	4,350	CY	2.50	10,875
	c. Seeding	2.5	AC	1,000.00	2,500
	Total Rounded				35,000
10	Total Contractors Earnings				$1,678,000
11	Contingencies @ 20%				332,000
12	Total Contractors Earnings and Contingencies				2,010,000
13	Engineering and Design				130,000
14	Supervision and Adiminstration				230,000
15	Total First Cost of Construction				$2,370,000

Table 4 - Real Estate Requirements

1. Levee Easement

	Acres	Fee Value Per Acre	Fee Value	Easement* Value
Commercial Land	3.01	$35.000	$105,350	$52,675
Industrial Land	0.40	40,000	16,000	8,000
Floodplain Land	2.04	3,000	6,120	3,060
Total	5.45		$127,470	$63,735

* 50 percent of Fee Value

2. Temporary Work Easement

a. Work Area

	Acres	Fee Value Per Acre	Fee Value	Easement ** Value
Commercial Land	0.86	$35,000	$ 30,100	$3,010
Industrial Land	0.20	40,000	8,000	800
Floodplain Land	0.76	3,000	2,280	228
Sub-Total			$ 40,380	$4,038

b. Access to Work Area

Commercial Land	0.17	$35,000	$ 5,950	595
Industrial Land	0.06	40,000	2,400	240
Floodplain Land	0.11	3,000	330	33
Sub-Total			$ 8,680	868

Temporary Work Easements, Total $4,906

** 10 percent of Fee Value

3. Non-Structural Fee Acquisition

a. 103 Feeder Street	$ 15,000
b. 105 Feeder Street	18,000
c. 121 Feeder Street (House Trailer)	3,000
d. Recreation Bldg. - Brooklea Drive	72,000
Total	$108,000

4. Total for Relocations and Easements

Levee Easements	$ 63,735
Work Easements	4,906
Relocations	108,000
Total Lands and Improvements	176,641
Damages	0
Contingency of 20% added in Table 3	-
Total Real Estate	$176,641
Rounded Value	$177,000

PLAN ACCOMPLISHMENTS

The plan provides protection from most floods. For the 100-year flood and less, the proposed improvement will eliminate all damages except for possible lawn damage in the lower portion of the project. For very rare floods (less than once in 500 years), the flood is usually of such magnitude that a small local protection project, such as this, would be totally indundated. In addition, the selected plan will neither increase or decrease the frequency or severity of flooding from Evans Brook.

Since the area around Sims, Kennedy, and Warner Streets will experience street and yard flooding before the project reaches design discharge, this area has a slightly lower level of protection than the upstream reach. However, because this flooding is relatively minor, we did not calculate the level of protection. By not tying the downstream levee to high ground, we have provided a built-in flood warning system which will reduce the chance of a surprise overtopping of the levees. Plate 3 and 4 show the 100-year flooded outline with and without the project.

The levees were designed with 1 on 2 sideslope on the creekside (covered with riprap), and with a 1 on 2.5 sideslope on the landside (covered with grass) to facilitate access and maintenance. In addition, several access ramps will be grouted into the riprap to improve fishing access. To protect the cold water characteristics of the stream, some revegetation along the edge of the creek will provide some afternoon shade cover for the stream.

The plan meets the requirements of Executive Order 11988 in that levee construction would protect existing floodprone developments only. Additional development within the protected area would be minimal due to the extent of existing developments and limited protection.

ENVIRONMENTAL IMPACTS

Initial areas of concern pertained to: potential impacts to identified significant fishery resources and wetland areas, protection of man-made resources vs. protection of the natural environment, potential impacts of alternative measures (i.e., channelization, relocations), and possible cumulative effects of the on-going Fayetteville, NY, and Manlius, NY, Section 205 project proposals. Because of these identified concerns, the need to prepare an Environmental Impact Statement was evident. Hopefully, these concerns have been substantially worked out via the planning process and coordination. With incorporation of various environmental design considerations and measures, adverse environmental impacts would be minimal.

The USF&WS made the following recommendations in their draft coordination report. Following each recommendation is our response as to how we addressed it in the study.

1. Recommendation: The land between the creek and Feeder Canal after relocation of the residents be revegetated and dedicated to wooded parkland or vegetated open space land with a minimum of man-made structures.

Response: It is our understanding that the land between the Creek and Feeder Canal in the project area will be owned by the State and dedicated to open space and potential parkland after project implementation.

2. Recommendation: A narrow bank of riparian vegetation, preferably the existing, be maintained along the margin of the Creek.

Response: Approximately 2,000 feet of sparse riparian vegetation will need to be removed from the west embankment north of the Genesee Street bridge for construction of a new levee. The levee in this area will be set-back however, and some revegetation including: grasses or legumes, reed canary grass, and purple oasier willow or facsimile will be planted between the creek and the levee for about 1,400 feet. Approximately 1,000 feet of riparian vegetation will need to be removed from the east embankment north of the Genesee Street bridge for construction of a floodwall and berm and placement of riprap. Stream fishery cover ledges will be placed just north of the bridges. Approximately 1,600 feet of mature riparian vegetation will need to be removed from the west embankment south of the Genesee Street bridge for construction of a new levee. There is not sufficient room for a set-back levee. Stream fishery cover ledges will be placed just south of the Genesee Street bridge and at the southern end of the project. Approximately 500 feet of mature riparian vegetation will need to be removed from the east bank south of the Genesee Street bridge for construction of a floodwall and placement of riprap. Riparian vegetation will remain along this bank for approximately 1,200 feet south of the floodwall to the southern project limit.

3. Recommendation: Fishermen access be provided in the vicinity of the floodwall as part of the project.

Response: Project design will incorporate features which will accommodate maintenance and initially informal fisherman access, and potentially more formal access at various sections of the project vicinity including: the bridge and floodwall vicinity, the area along the west embankment north of the Genesee Street bridge, and the dam and the feeder canal vicinity.

4. Recommendation: Destruction and/or disturbance of both riparian and terrestrial vegetation be avoided where possible during construction.

Response: Some removal of riparian and terrestrial vegetation will be unavoidable to accommodate project construction, but will be avoided and/or minimized to the degree possible.

5. Recommendation: Prior to construction a revegetation plan be developed for the project area in coordination with the New York State Department of Environmental Conservation and the United States Fish and Wildlife Service. The plan should include provisions for monitoring growth to ascertain successful revegetation.

Response: A general environmental considerations and revegetation plan is included with these documents as Environmental Appendix E. Plans will be coordinated in more detail with preparation of final plans and specifications.

6. Recommendation: Prior to construction an erosion and/or siltation control plan be developed in coordination with the New York State Department of Environmental Conservation, United States Fish and Wildlife Service, United States Environmental Protection Agency, and the United States Soil Conservation Service. Dredging and other turbidity producing work should not occur between October 1 and June 1.

Response: General erosion and siltation control guidelines which are incorporated in preparation of project plans and specifications are included with these documents as Environmental Appendix F.

We will try and expect to accommodate the June 1 through October 1 in-stream construction environmental window; and will coordinate with the United States Fish and Wildlife Service and the New York State Department of Environmental Conservation, if there is a future problem with this restriction.

ECONOMIC SUMMARY

Economic justification is based on the degree of feasibility the plan indicated when costs and benefits are compared. The costs and benefits for this plan were evaluated for a 50-year period at a discount rate of 8-7/8 percent, and are shown in Table 5.

Implementation of the selected plan will produce benefits in three categories: reduced flooding damages, reduce flood insurance overhead costs, and the value of relocated structures. Ninety-seven percent of the estimated $638,000 in average annual benefits is due to the reduction in flooding damages. A more detailed summary of the analysis of benefits can be found in Appendix B.

Table 5 - Summary of Annual Costs and Benefits
(February 1987 Price Level - 8-7/8 Percent)

	$
Interest and Amortization	219,780 *
Operation and Maintenance	48,820
Total Annual Costs	268,600
Total Annual Benefits	638,000
Benefit/Cost Ratio	2.38
Net Annual Benefits	369,400

* - Includes Interest during construction, 9 monthly payments at 8-7/8 percent per year.

Plan Implementation

This section summarizes the cost apportionment for the Selected Plan as well as the implementation responsibilities.

REVIEW AND IMPLEMENTATION

This final planning report is initially reviewed by our Division Office in Chicago. After Division review (and District revision, if necessary) the report is sent to the Office of the Chief of Engineers (OCE) in Washington, DC, and is reviewed within a 30 day period by concerned government agencies and the public. Preparation of plans and specifications can begin during this time. The District answers comments from the public and other agencies by letter. A draft Record of Decision (ROD) along with public comments and District responses are forwarded to the Division and then to OCE for final consideration. The approved ROD is signed and coordinated with the public and concerned agencies when the project is approved by OCE. Once this approval has been granted, the Local Cooperation Agreement can be signed and the land acquisition process can begin. A construction contract can not be awarded until lands, easements, and right-of-way and other assurances are provided.

DIVISION OF PLAN RESPONSIBILITIES

Under the terms of the Water Resources Development Act of 1986 (PL 99-662), the non-Federal sponsor must still provide all lands, easements, rights-of-way, and relocations (LERR), as in the past. In addition, the non-Federal sponsor must provide a minimum of 25 percent of the construction costs, and at least 5 percent in cash. The local share is calculated as follows: if LERR is 20 percent or more of construction costs, the local sponsor must provide 5 percent of construction costs in cash before construction begins. If LERR is less than 20 percent, then the non-Federal sponsor must provide enough cash so that the value of LERR and cash together is 25 percent of construction costs. Based on the estimated costs for the Fayetteville project, it appears that the local sponsor will be responsible for about $592,500 of the estimated $2,370,000 total cost.

The non-Federal sponsor for this project is the New York State Department of Environmental Conservation (NYSDEC). NYSDEC has worked closely with the Corps in the development of the selected plan. NYSDEC assumes responsibility for the items of local cooperation which are spelled out in the "RECOMMENDATIONS" section of this report.

Table 6 - Estimated Cost Sharing (February 1987 Price Levels)

Item	Federal	Non-Federal	Total
	$	$	$
Cost of Real Estate Requirements (includes 20% contingency factor):	0	212,400	212,400
Cash Contribution	1,777,500	380,100	2,157,600
Total (1)	1,777,500	592,500	2,370,000

(1) Cost sharing is stipulated by the provisions of the Water Resources Development Act of 1986. See Page 29 for more details.

Views of Non-Federal Interests

Appendix D of this report is composed of correspondence from individuals, private organizations, and Federal, State, county, and local agencies.

The comments of the U.S. Fish and Wildlife Service are addressed in the Environmental Impacts section (page 26 of this report).

The flooding problems described in this report are widely recognized, especially since the flood that occurred in October 1981. A public meeting was held on 12 February 1982 in Fayetteville; Col. George P. Johnson, then Buffalo District Engineer, presided. The meeting was attended by Federal, State, and local representatives as well as residents of the Limestone Creek basin.

After a discussion of the flooding problems in the Limestone basin and the potential solutions which the Corps could recommend, the majority of the attendees spoke in favor of a local flood control project in Fayetteville. Opposition was voiced by people who lived outside the villages of Fayetteville and Manlius. They wanted the Corps to construct an upstream reservoir large enough to control flooding throughout the basin. (The reservoir plans evaluated by the study team had benefit-cost ratios less than one, see EIS 2.04).

Conclusions

Corps studies have shown there is a need for flood protection measures in the village of Fayetteville, NY. They have also shown that these needs can best be met by the construction of a local protection project that would provide protection from a flood with a recurrence interval of about once in 100-years. With incorporation of various environmental design considerations and measures, adverse environmental impacts would be minimal with the Selected Plan.

Recommendations

I recommend that the Selected Plan described in the report be used as a basis for preparing plans and specifications, with such modifications as in the discretion of the Chief of Engineers may be advisable at a total estimated first cost of $2,370,000 (February 1987 price levels) consisting of $1,777,500 Federal Cost and $592,500 non-Federal. This recommendation is made provided that prior to construction, non-Federal interests furnish assurances satisfactory to the Secretary of the Army that they will:

a. Provide, during the period of construction, all lands, easements, rights-of-way, and utility and facility alterations and relocations required for construction of the project, regardless of the value;

b. Acquire the property and improvements at 103, 105, and 121 Feeder Street and the Recreation Building on Brooklea Drive;

c. Provide a cash payment of not less than 5 percent of total project costs during the period of construction, regardless of the value of the items in (a) and (b) above:

d. If the value of the items in (a) above is less than 20 percent of total project costs, then provide, during the period of construction, such additional cash payments as are necessary to bring its total contribution in cash and the value of lands, easements, rights-of way, and utility and facility alterations and relocations to an amount equal to 25 percent of total project costs;

e. Hold and save the United States free from damages due to the construction, and subsequent operation and maintenance of the project, except for damages due to the fault or negligence of the United States or its Contractors;

f. Maintain and operate the project, or integral parts thereof, after completion in accordance with regulations prescribed by the Secretary of the Army;

g. Prescribe and enforce regulations to prevent obstruction or encroachment that would interfere with proper functioning or maintenance and operation of the project;

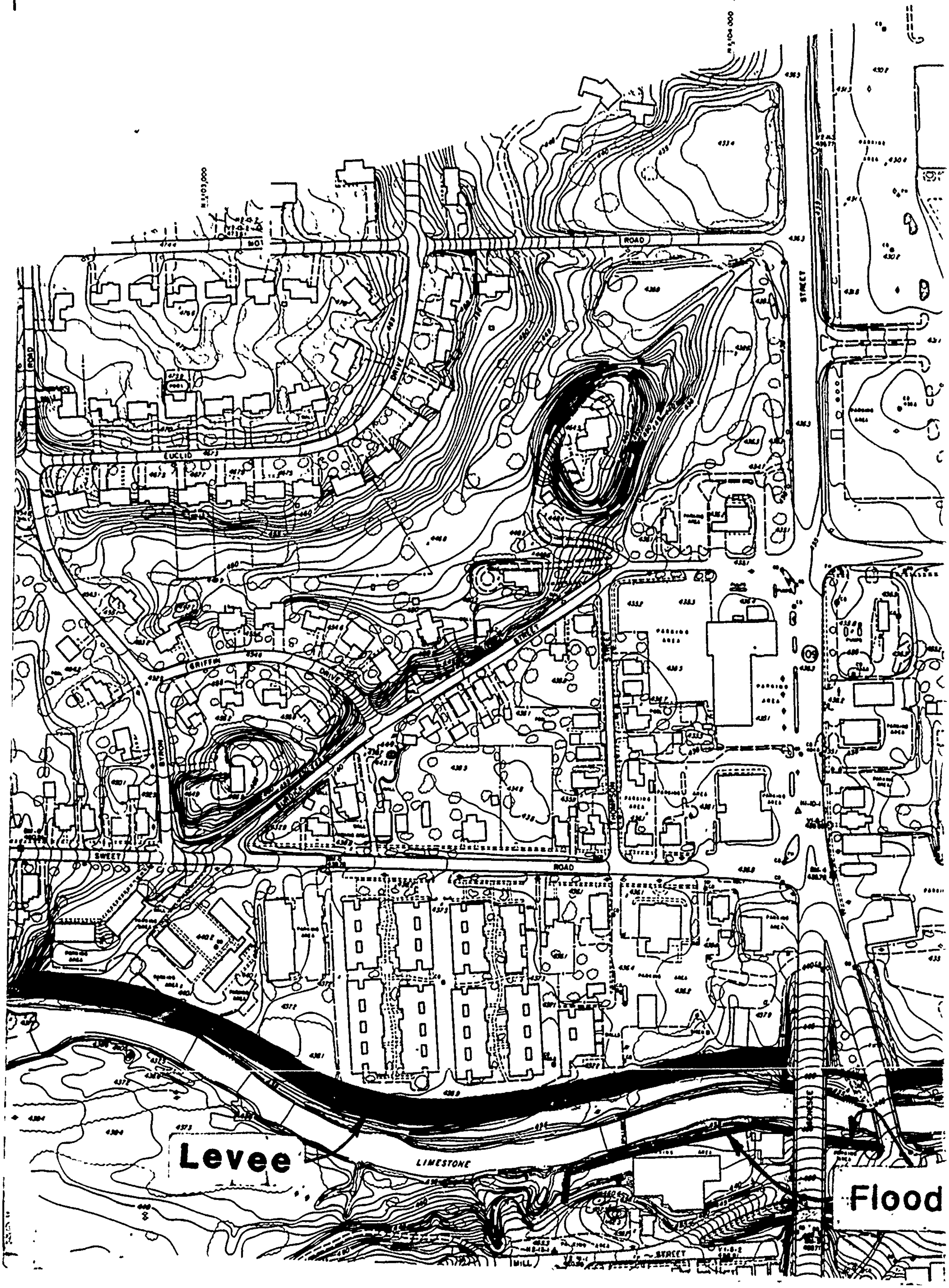
h. Assume full responsibility for all project costs in excess of the Federal statutory cost limitation of $5,000,000;

i. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved 2 January 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent maintenance of the project and inform affected persons of pertinent benefits, policies, and procedures in connection with said act.

j. Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (P.L. 880352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, in connection with the maintenance and operation of the project.

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

Plate 1



ROAD
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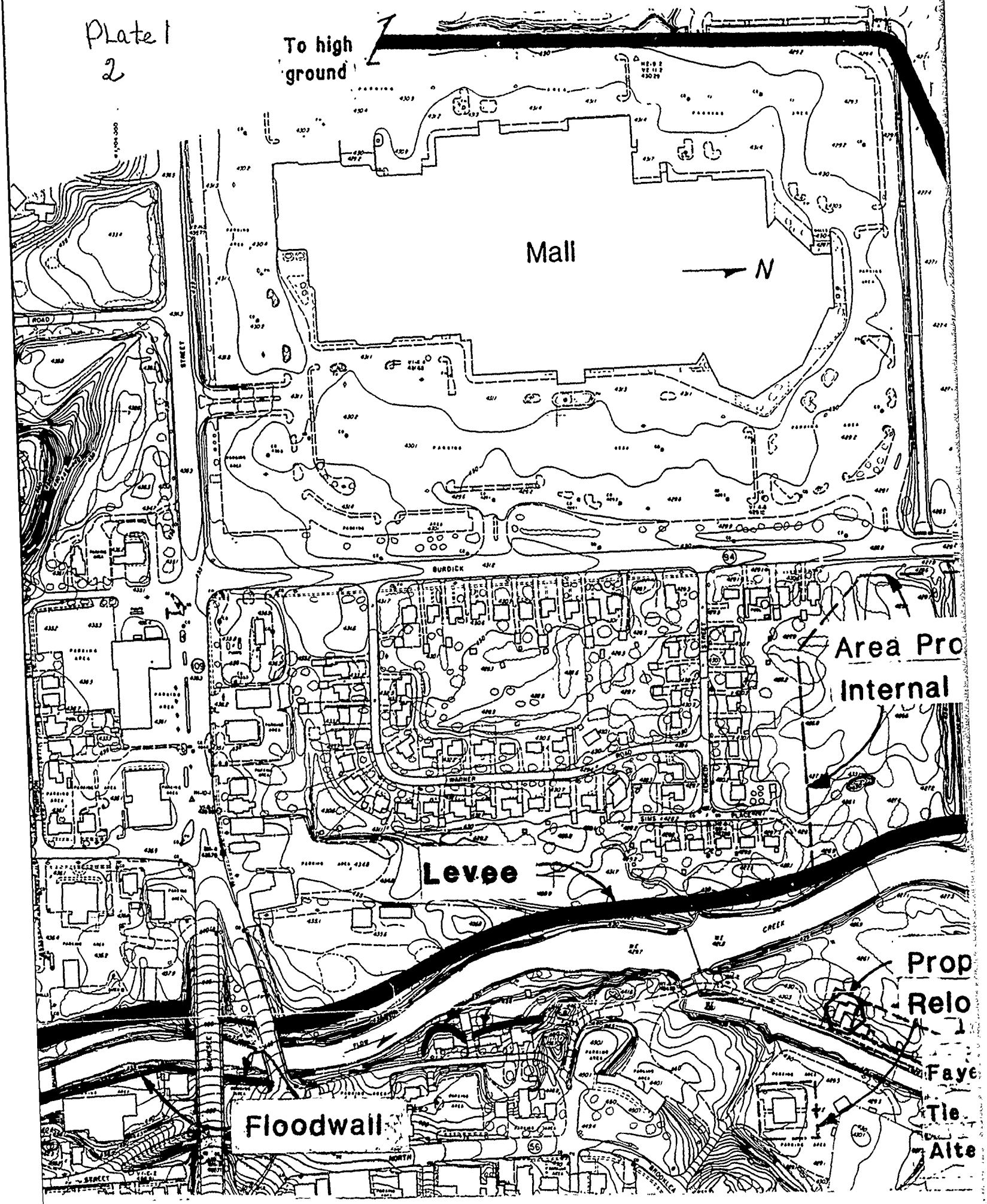
Plate 1
2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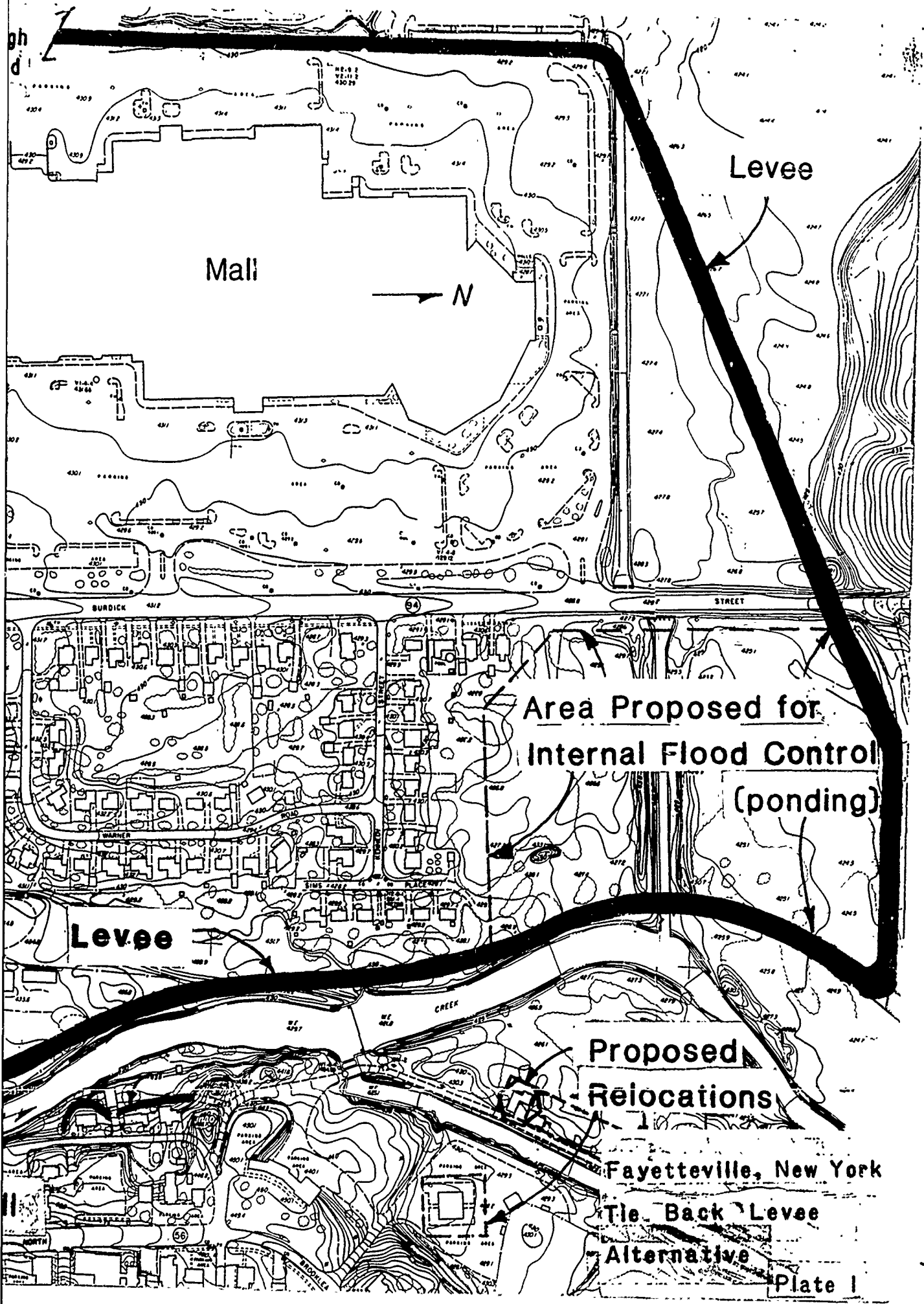
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STREET
Area Proposed for
Internal Flood Control
(ponding)
Levee
Proposed
Relocations
Fayetteville, New York
Tie Back Levee
Alternative
Plate 1

3

Plate 2

1 of 3

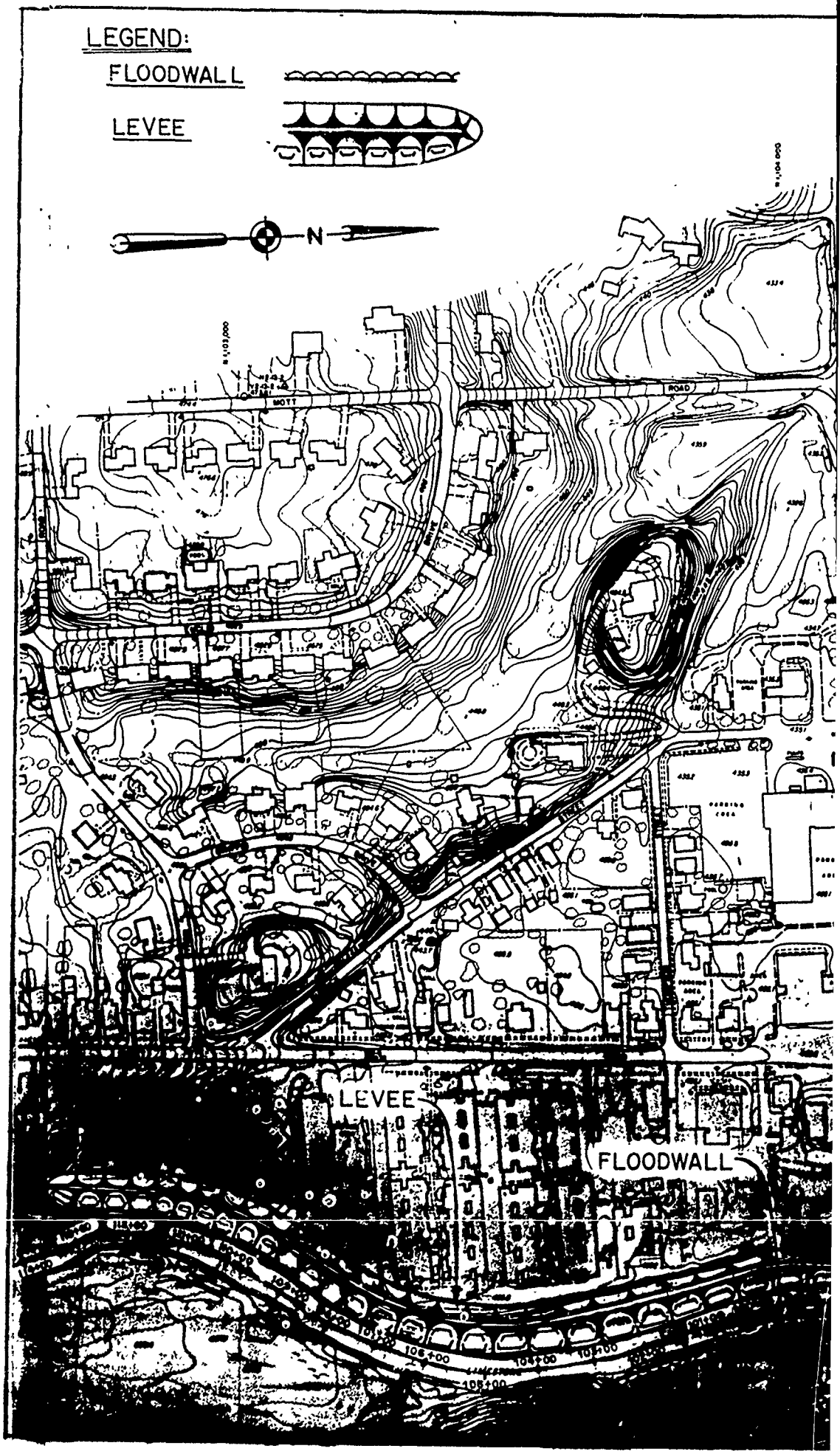
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Plate 2
2 of 3

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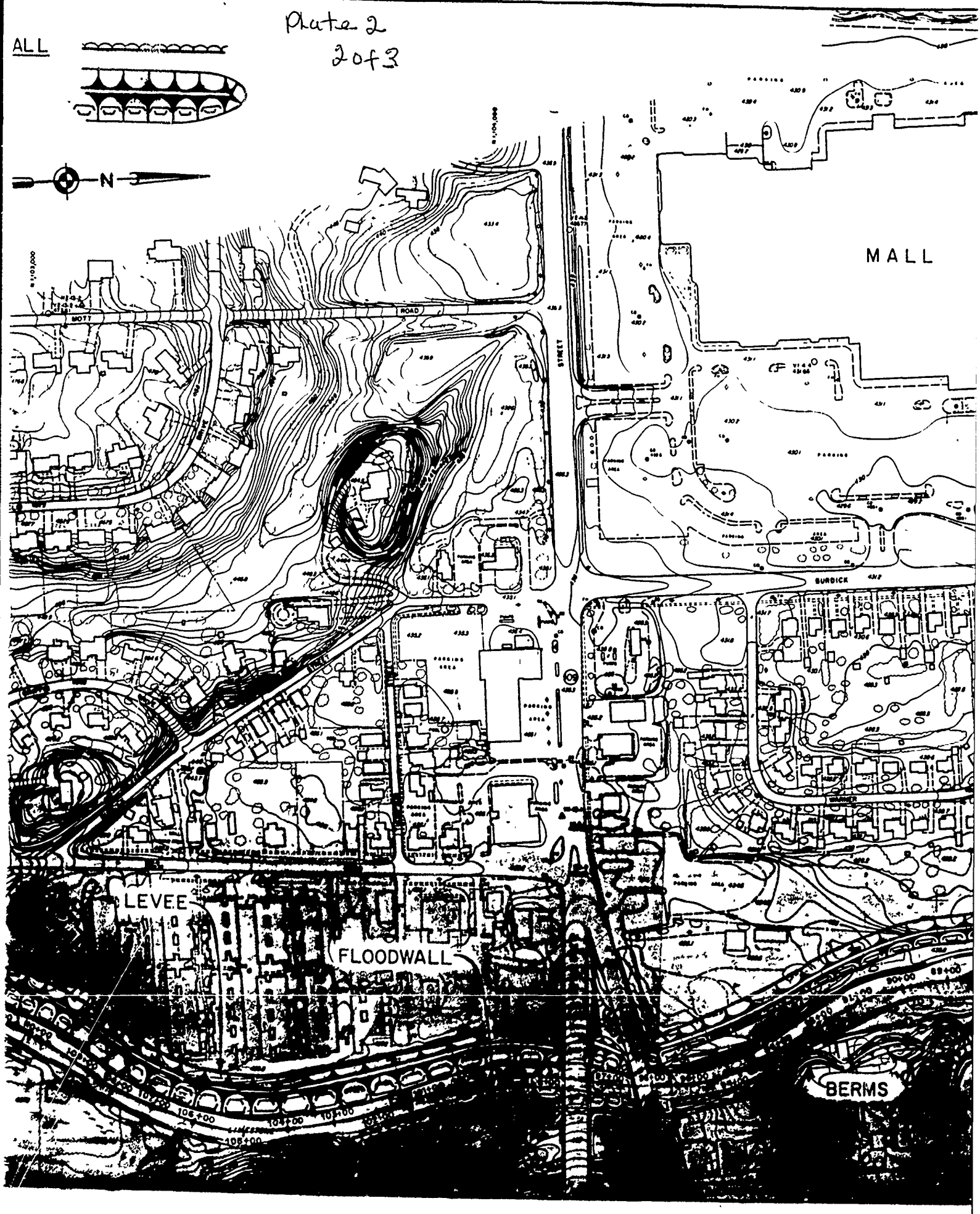
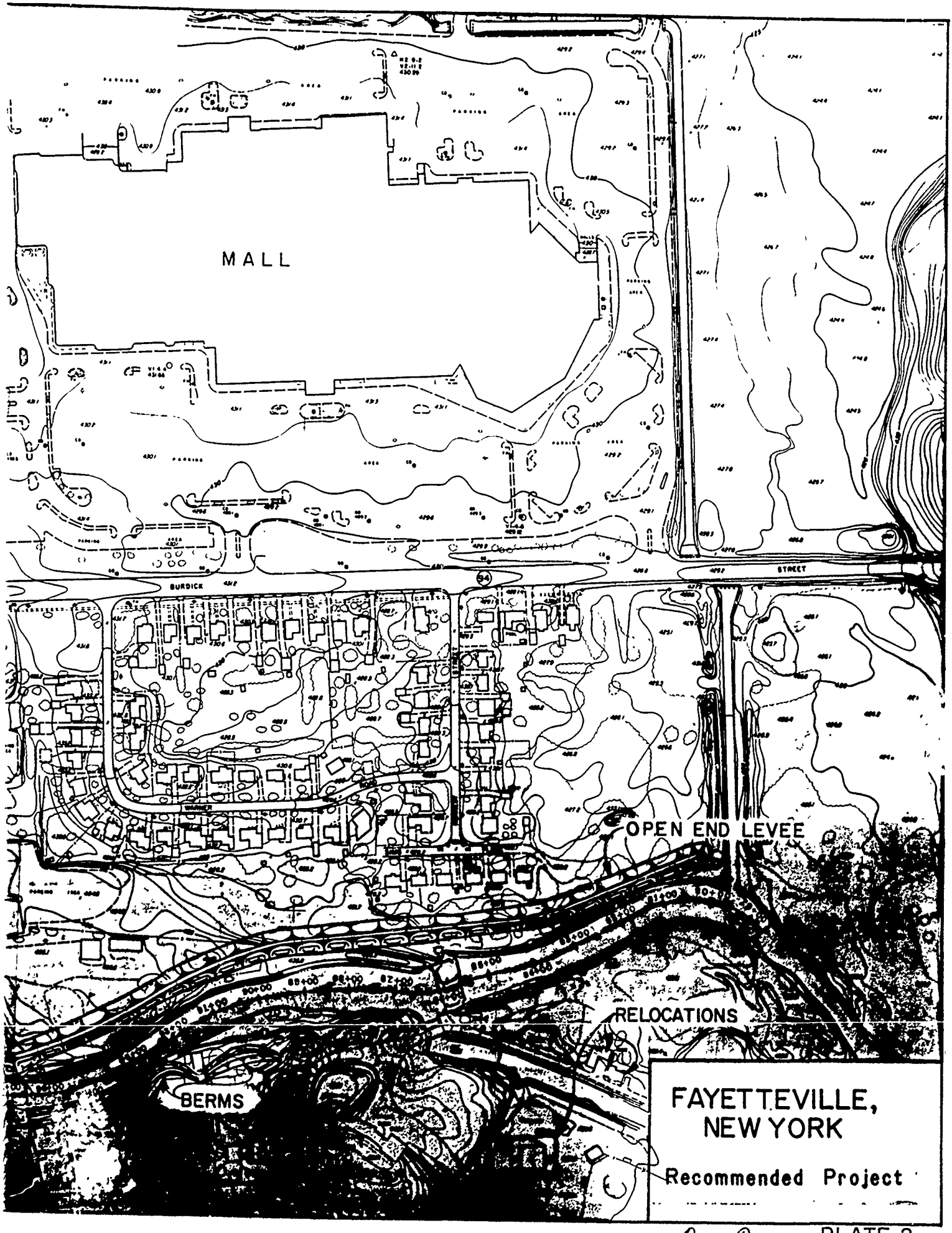




FAYETTEVILLE, NEW YORK

Recommended Project

3 of 3

PLATE 2

Plate 3
1 of 3

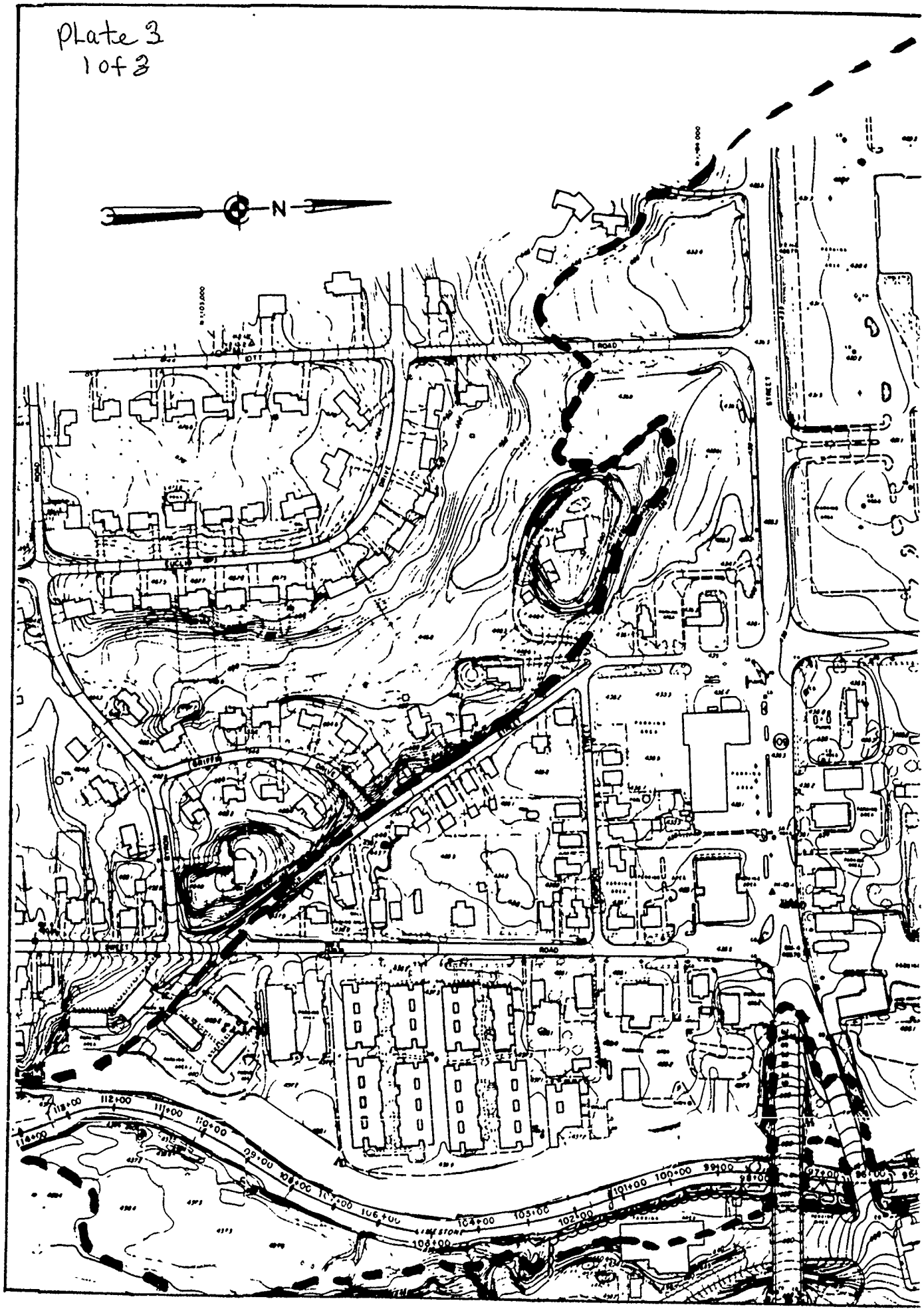
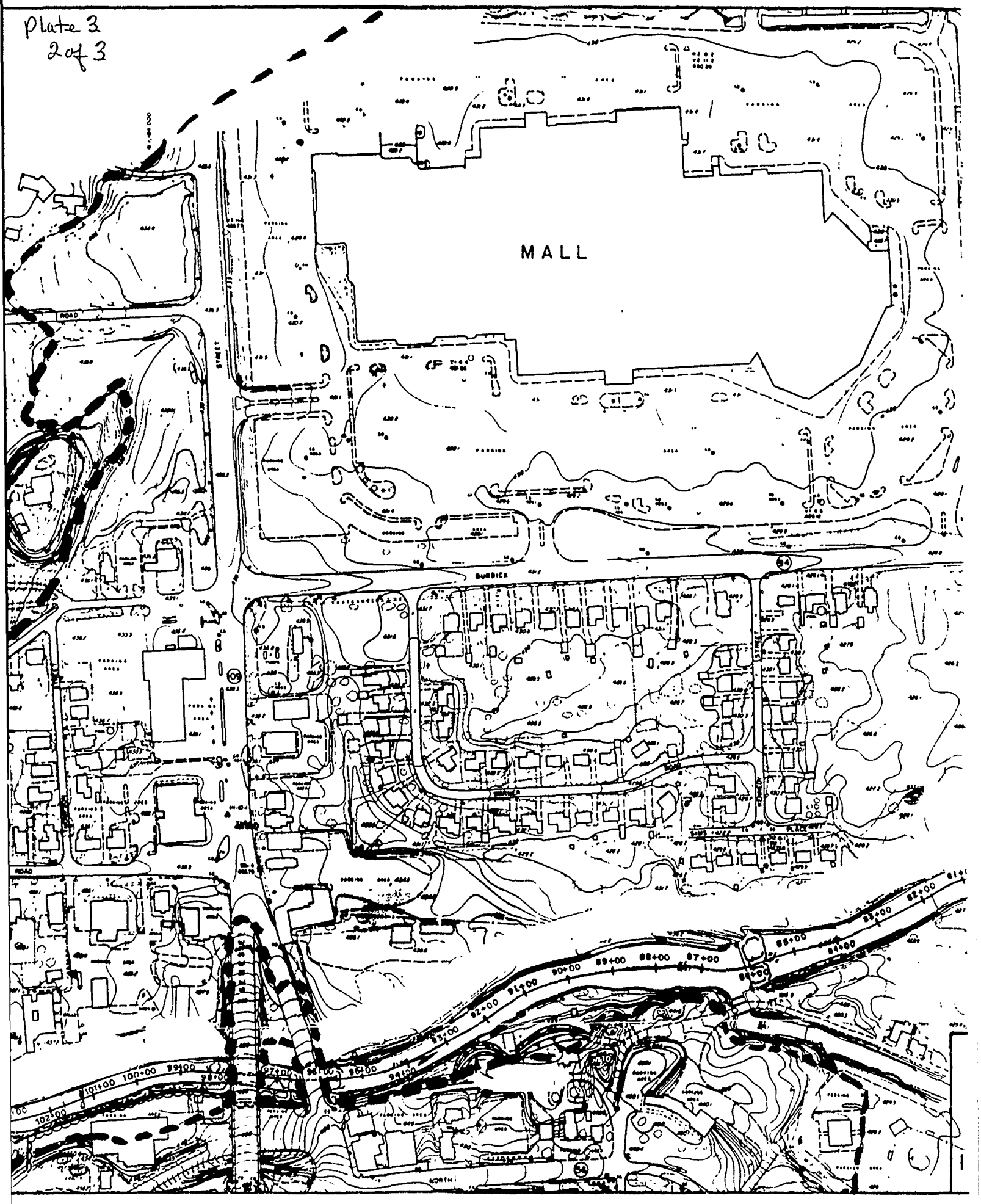


Plate 3
2 of 3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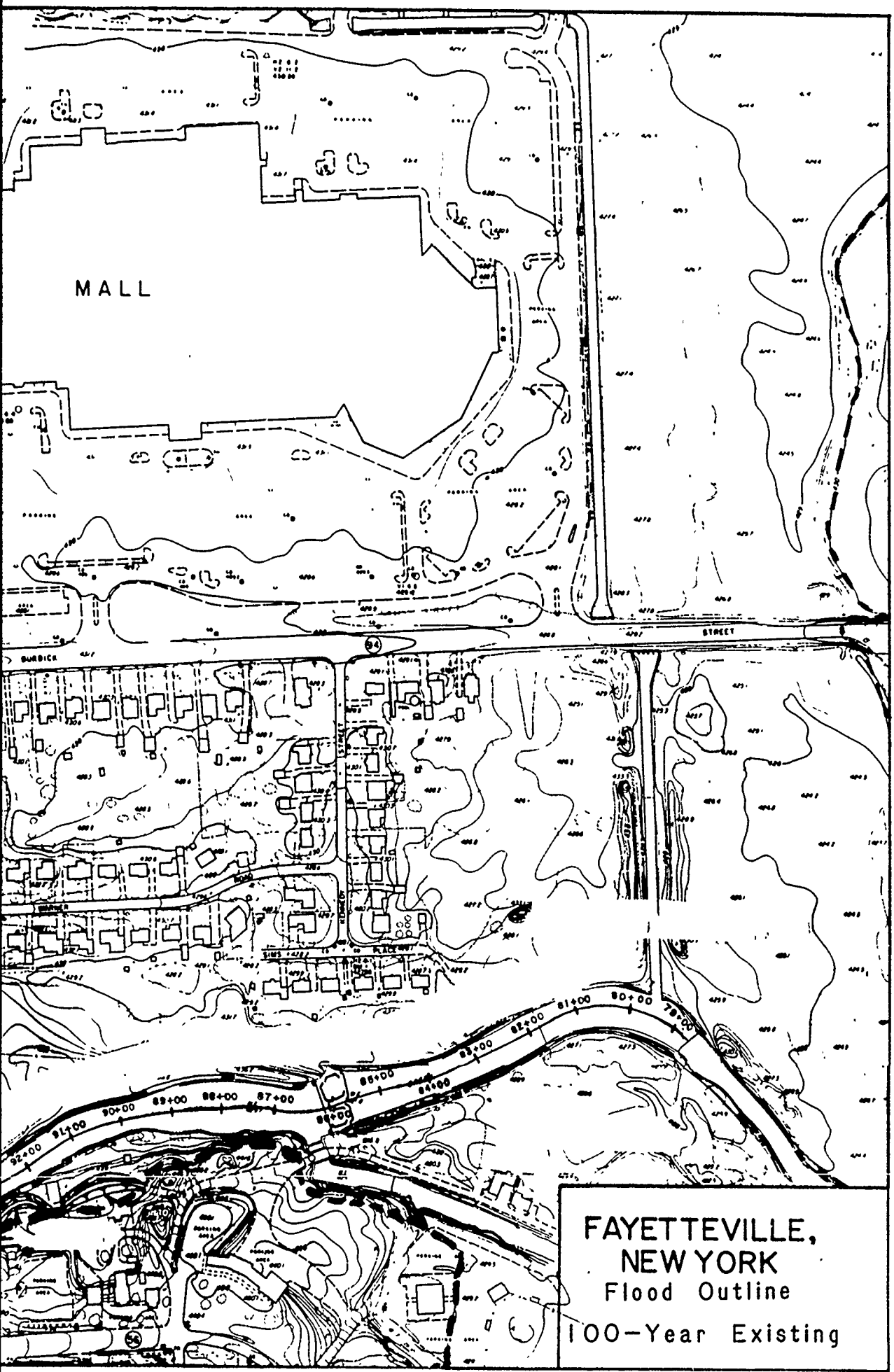

FAYETTEVILLE, NEW YORK

Flood Outline

100-Year Existing

Plate 3

Plate 4
1 of 3

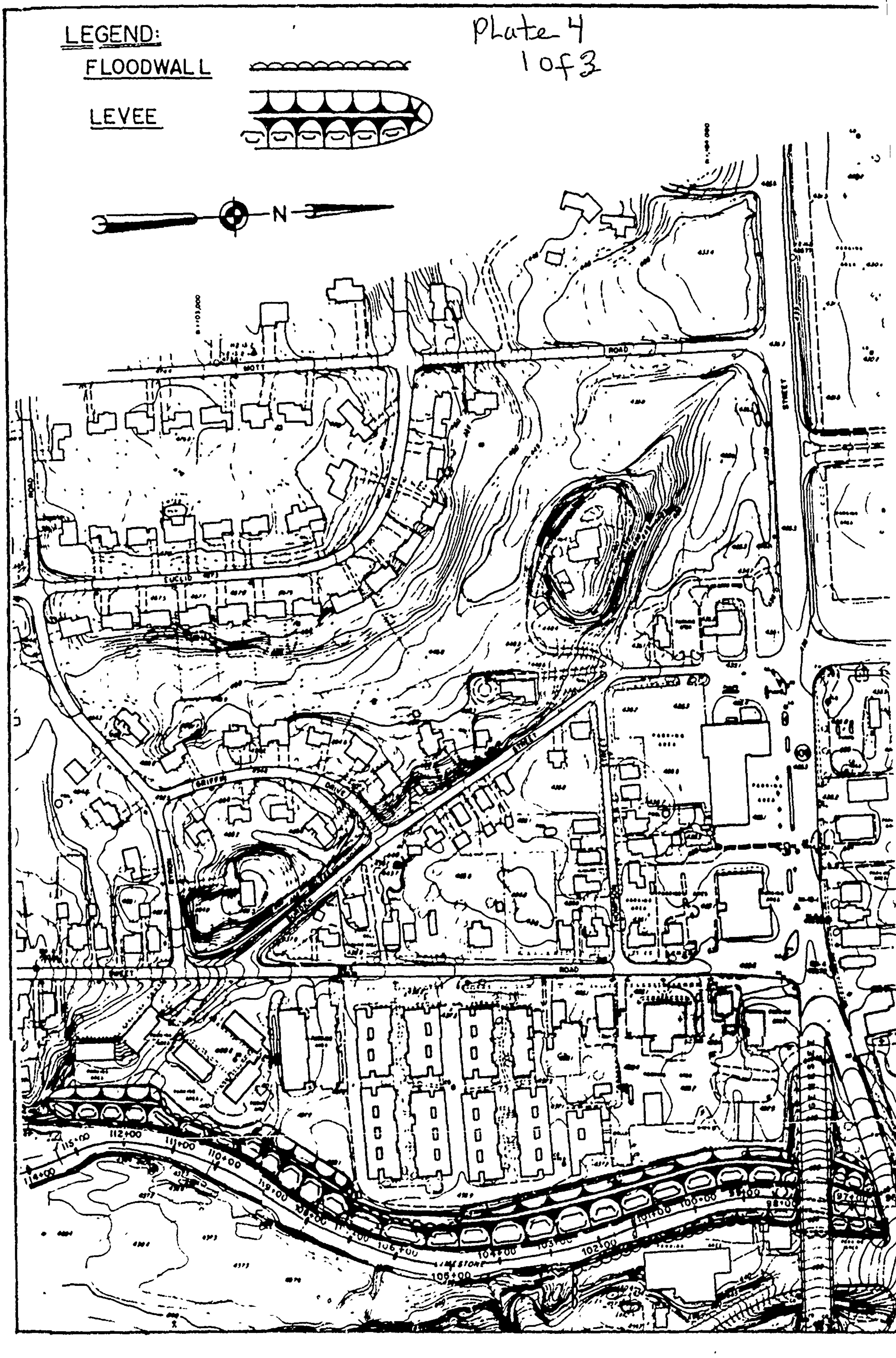
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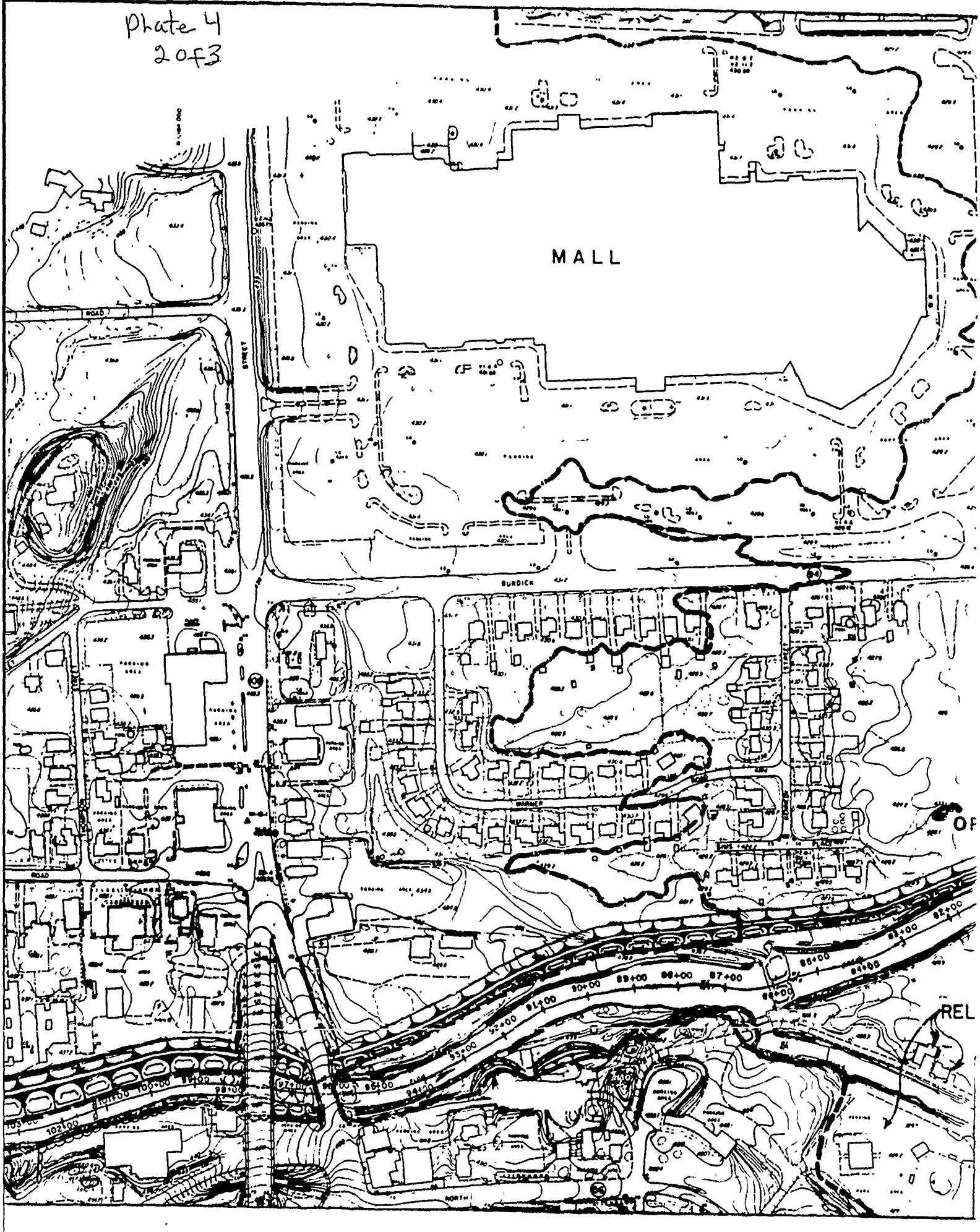
Plate 4
2 of 3



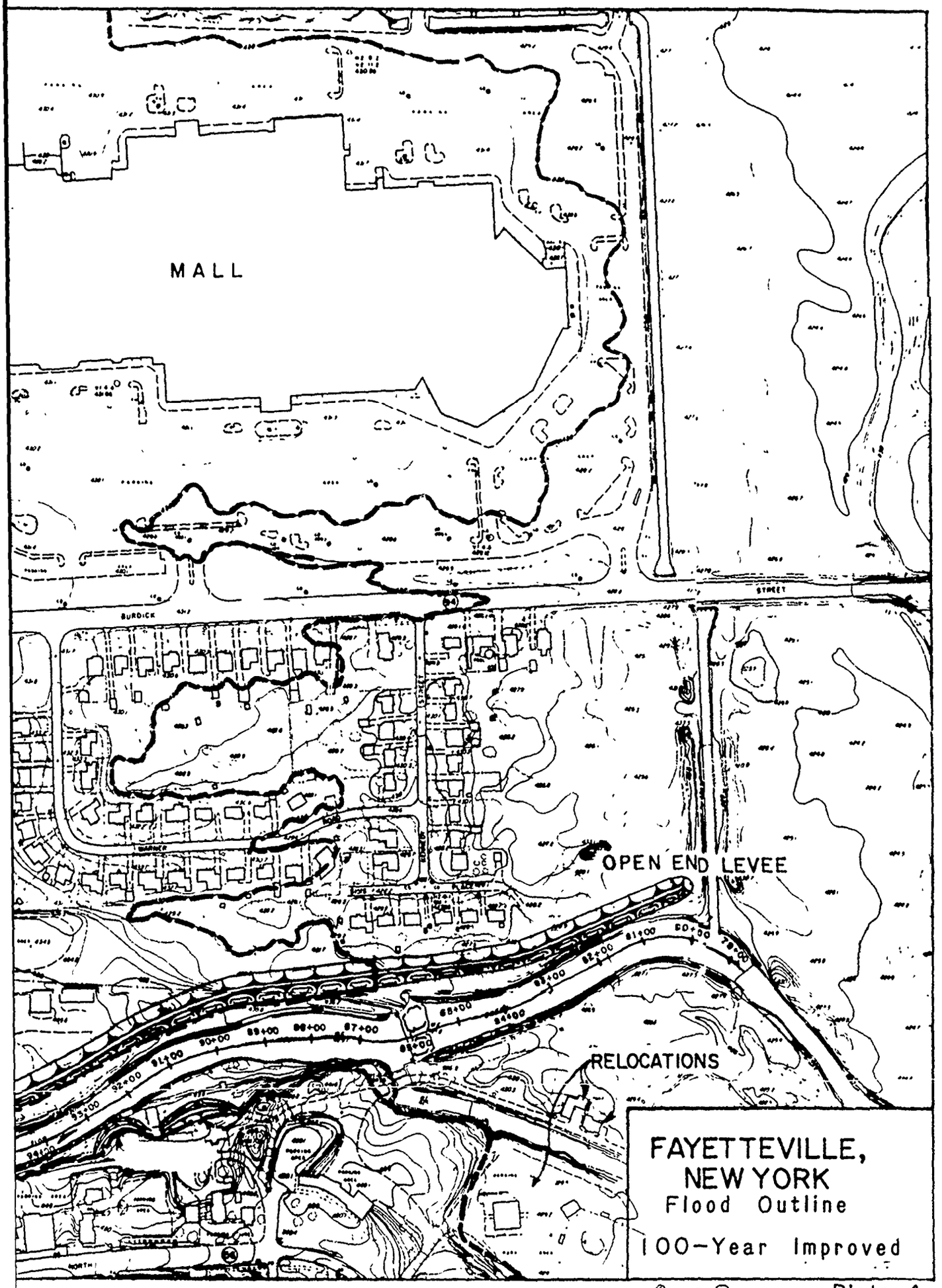

MALL
BURDICK
STREET
OPEN END LEVEE
RELOCATIONS
FAYETTEVILLE,
NEW YORK
Flood Outline
100-Year Improved

Plate 4

LIMESTONE CREEK-FAYETTEVILLE, NY

FINAL ENVIRONMENTAL IMPACT STATEMENT OF FLOOD DAMAGE REDUCTION PLANS AT FAYETTEVILLE, NY UNDER AUTHORITY OF SECTION 205 OF THE 1948 FLOOD CONTROL ACT AS AMENDED

U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207
1987

ENVIRONMENTAL IMPACT STATEMENT

PROPOSED PLAN FOR
FLOOD DAMAGE REDUCTION
ON LIMESTONE CREEK AT
FAYETTEVILLE, ONONDAGA COUNTY, NY

The responsible lead agency is the U. S. Army Engineer District, Buffalo, NY. The responsible cooperating agency is the New York State Department of Environmental Conservation (NYSDEC).

ABSTRACT: The village of Fayetteville is a small community in Onondaga County located about 7 miles southeast of the city of Syracuse in central New York State. Limestone Creek flows through the center of the village. Flooding from Limestone Creek has caused substantial repeated property damage and hardships for residents and businesses in the community. The Buffalo District has investigated public concerns and potential alternative solutions for addressing these flooding problems. Of the numerous potential measures and plans initially investigated, only two were selected for final consideration. One is the "No Action" Plan. This plan indicates that the Corps of Engineers acting for the Federal Government could take "no action" based on an evaluation of the problems and possible alternative solutions as directed by the study authority. Without conditions would be anticipated with this alternative. This does not exclude possible action under referred authority or by other Federal, State, or local entities. The no action alternative is always a possibility and serves as the basis of comparison by which the other possible alternatives may be compared. Plan 1 - Levee/Floodwall Protection - involves utilization of levee structures, where possible, or floodwall structures, in constrictive areas, to prevent floodwaters from inundating the existing floodprone community developments. The floodwaters would, therefore, be confined to the existing stream channel and the remaining unprotected flood plain area. Minor relocation measures would also be necessary with this plan. Having assessed the various alternatives for engineering and economic feasibility and social and environmental acceptability, Plan 1 has been tentatively selected based on its performance in addressing the identified community needs and in sufficiently satisfying the national goals and project planning objectives. Plan 1 is the plan which reasonably maximizes NED benefits.

If you would like further information on this statement please contact:

Mr. Tod Smith
Commercial Telephone:
(716) 879-4173

NOTE: Information, displays, maps, etc., discussed in the Limestone Creek, Fayetteville-Detailed Project Report - Main Report are incorporated by reference in the EIS.

SUMMARY

MAJOR CONCLUSIONS AND FINDINGS

The village of Fayetteville is a small community in Onondaga County located about 7 miles southeast of the city of Syracuse in central New York State. Limestone Creek flows through the center of the village. Flooding from Limestone Creek has caused substantial repeated property damage and hardships for residents and businesses in the community. The Buffalo District has investigated public concerns and potential alternative solutions for addresssing these flooding problems.

This study is being completed under authority of Section 205 of the 1948 Flood Control Act, as amended, which authorizes small flood control projects. The study shows that there are feasible flood damage reduction measures whose total Federal first cost would not exceed the Federal cost limit for projects authorized under this authority. Completion of the study under this small projects continuing authority significantly expedites the potential for implementation of an alternative solution in addressing the public concern with flooding.

Alternative measures and plans have been evaluated for engineering and economic feasibility and social and environmental acceptability in order to select those which best meet the planning objectives of the study. The primary planning objectives include: to contribute to national economic development consistent with protecting the nation's environment pursuant to environmental requirements; to provide flood damage reduction measures, where possible, to the existing floodprone community developments; to reduce flood-related health and safety hazards; to conserve or enhance, where possible, fish and wildlife and cultural resources; and to encourage wise flood-related future community development policies.

Of the numerous potential measures and plans initially investigated, only two were selected for final consideration. One is the "No Action" plan. This plan indicates that the Corps of Engineers acting for the Federal Government could take "no action" based on an evaluation of the problems and possible alternative solutions as directed by the study authority. Without conditions would be anticipated with this alternative. This does not exclude possible action under referred authority or by other Federal, State, or local entities. The no action alternative is always a possibility and serves as the basis of comparison by which the other possible alternatives may be compared.

Plan 1 - Levee/Floodwall Protection - involves utilization of levee structures, where possible, or floodwall structures, in constrictive areas, to prevent floodwaters from inundating the existing community floodprone developments. The floodwaters would, therefore, be confined to the existing stream channel and the remaining unprotected flood plain areas. Minor relocation measures would also be necessary with this plan.

Generally, with plan implementation, minor adverse impacts would occur to: air quality, water quality, fisheries habitat, riparian vegetation, aesthetics, and displacement of people; while long-term benefits would be realized

for: flood damage reduction, desirable community growth, land use and development, business, recreational opportunities, public facilities and services, property values and tax revenue, and community cohesion. Reference Table Text 2 and this EIS.

The evaluation process requires that feasible alternatives be evaluated to determine their efficiency in meeting the national water resources planning objective. This requires identification of an NED (National Economic Development) Plan consistent with environmental requirements. The NED Plan represents the best return on the investment of economic resources needed for construction from a national point of view.

Plan 1 - is evaluated as being both engineeringly and economically feasibile, and with appropriate environmental design measures, socially and environmentally acceptable. It best contributes to national economic development (NED) consistent with protecting the Nation's environment (EQ) pursuant to national environmental statutes, applicable executive orders, and other Federal, State, and local planning requirements. Plan 1 - Levee/Floodwall Protection has been tentatively selected for implementation based on its performance in addressing the identified community needs and in sufficiently satisfying the national goals and project planning objectives.

AREAS OF CONTROVERSY

Initial areas of controversy pertained to: potential impacts to identified significant fishery resources and wetland areas, protection of man-made resources vs protection of the natural environment, potential impacts of alternative measures (i.e., relocation), and possible cummulative effects of the ongoing Fayetteville, NY, and Manlius, NY, Section 205 project proposals. These controversies have been worked out via the planning process and through planning coordination.

UNRESOLVED ISSUES

Major controversies have been resolved. No major unresolved issues at this time.

RELATIONSHIP TO ENVIRONMENTAL PROTECTION STATUTES AND OTHER ENVIRONMENTAL REQUIREMENTS

The following table indicates the relationship of plans considered in detail to environmental protection statutes and other environmental requirements. Reference also the paragraphs under REQUIRED COORDINATION in SECTION 6 - PUBLIC INVOLVEMENT, and the Environmental and Correspondence Appendices.

Table Text A - Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements

	No Action Without Conditions	Alternative 1
Federal Statutes		
Archeological and Historic Preservation Act, as amended, 16 USC 469, et seq.	N/A	Full
National Historic Preservation Act, as amended, 16 USC 470a, et seq.	N/A	Full
Fish and Wildlife Coordination Act, as amended, USC 661, et seq.	N/A	Full
Endangered Species Act, as amended, 16 USC 1531, et seq.	N/A	Full
Clean Air Act, as amended, 42 USC 7401, et seq.	N/A	Full
Clean Water Act, as amended (Federal Water Pollution Control Act), 33 USC 1251, et seq.	N/A	Full
Federal Water Project Recreation Act, as amended, 16 USC 460-1(12), et seq.	N/A	Full
Land and Water Conservation Fund Act, as amended, 16 USC 4601-11, et seq.	N/A	Full
National Environmental Policy Act, as amended, 42 USC 4321, et seq.	N/A	Full
Rivers and Harbors Act, 33 USC 401, et seq.	N/A	N/A
Wild and Scenic Rivers Act, as amended, 16 USC 1271, et seq.	N/A	N/A
Coastal Zone Management Act, as amended, 16 USC 1451, et seq.	N/A	N/A
Estuary Protection Act, 16 USC 1221, et seq.	N/A	N/A
Marine Protection, Research and Sanctuaries Act, 22 USC 1401, et seq.	N/A	N/A
Watershed Protection and Flood Prevention Act, 16 USC 1001, et seq.	N/A	Full
Executive Orders, Memoranda, Etc.		
Protection and Enhancement of the Cultural Environment (EO 11593)	N/A	Full
Flood Plain Management (EO 11988)	N/A	Full
Protection of Wetlands (EO 11990)	N/A	Full
Environmental Effects Abroad of Major Federal Actions (EO 12114)	N/A	N/A
Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, 30 Aug 76)	N/A	Full
New York State Freshwater Wetlands Act (Wetlands >12.4 acres)	N/A	Full
Environmental Conservation Law - Article 15 (Protection of Water)	N/A	Full
Local Land Use Plans (See Flood Plain Management EO 11988 also)	N/A	Full

The compliance categories used in this table were assigned based on the following definitions.

a. Full Compliance - All requirements of the statute, EO, or other policy and related regulations have been met for this stage of the study.

b. Partial Compliance - Some requirements of the statute, EO, or other policy and related regulations, which are normally met by this stage of planning, remain to be met.

c. Noncompliance - None of the requirements of the statute, EO, or other policy and related regulations have been met.

d. N/A - The statute, EO, or other policy and related regulations are not applicable for this study.

ENVIRONMENTAL IMPACT STATEMENT

PROPOSED PLAN FOR
FLOOD DAMAGE REDUCTION
ON LIMESTONE CREEK AT
FAYETTEVILLE, ONONDAGA COUNTY, NY

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LIMESTONE CREEK - FAYETTEVILLE, NY

SECTION 1 - NEED FOR AND OBJECTIVES OF THE ACTION

INTRODUCTION

1.01 This section briefly summarizes the study authority, the flooding problems and needs identified in the project area, and the planning objectives developed for the study.

STUDY AUTHORITY

1.02 This report was prepared under the authority of Section 205 of the 1948 Flood Control Act, as amended. An investigation to determine the applicability of Section 205 was initiated in response to a letter dated 23 October 1980 from James H. Lannon, Mayor, Village of Fayetteville, NY; requesting that the Corps of Engineers conduct a study of areas within the village that are periodically subject to flooding from Limestone Creek. The Reconnaissance Report was prepared and approved in May 1981.

PROBLEMS AND NEEDS

1.03 The topography, an expansive flood plain, and limited channel capacity, makes the Fayetteville area susceptible to flooding which occurs both in summer, from excessive rainfall, and in winter and spring from a combination of snowmelt and rainfall. Flooding to some degree occurs yearly and documented flooding goes back to 1898. The last recorded flooding took place in October 1981 when Kennedy-Sims Place and Burdick area streets were flooded and water nearly entered the Fayetteville Mall development. This was identified as a 25 year flood event. See Reference Figure 3.

1.04 In 1980, an estimated 120 residential, 20 multi-family, 52 commercial (including the shopping mall), two industrial and two public structures occupied the (Fayetteville) Limestone Creek 100-year flood plain. Less than 5 percent of those structures occupy the east bank; the remainder occupy the west bank where there is the most extensive flood plain and where the majority of flooding occurs. The majority of the flood damage is to commercial properties. Flood damages from a 100-year event, based on present conditions, would total approximately $18 million. Project estimated average annual flood damage is about $688,000. The large amount of average annual damages is due to the large number of structures in the flood plain and the multi-million dollar damages expected from rarer storms.

1.05 A need exists for flood management to protect human health and safety, property, industry, and the environment in Fayetteville and the town of Manlius from recurrent annual flooding and floods caused by rare, severe storms. Debris jams, low banks, stream gradients, and poor channel alignment often affect the degree of flooding, and sufficient remedial action by man is likely to reduce economic losses due to flooding.

PLANNING OBJECTIVES

1.06 The Federal objective of water and related land resources project planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

1.07 Planning objectives which were derived from resource management needs and utilized in plan formulation for the project vicinity include:

a. To provide where economically feasible, flood damage reduction measures for the existing flood prone community developments to preserve community economic and social well-being.

b. To encourage future land use practices consistent with national flood insurance and flood plain management policies to protect future community economic and social well-being and environmental quality.

c. To reduce through flood damage reduction measures, health and safety hazards related to flooding in the Fayetteville vicinity.

d. To preserve or enhance where possible, the fish and wildlife resources (habitat) in the project vicinity to protect the natural environmental quality in the project vicinity.

e. To preserve or enhance the fishing access in the village of Fayetteville.

f. To preserve, as necessary, cultural resources in the project vicinity to protect the cultural heritage of the Fayetteville vicinity.

SECTION 2 - ALTERNATIVES

INTRODUCTION

2.01 This section will briefly identify and describe all reasonable and feasible alternatives considered, and the assessment and evaluation of the most responsive solutions.

PLANS ELIMINATED FROM FURTHER STUDY

2.02 With the initiation of the detailed Project Report (DPR) investigation, a wide spectrum of both structural and nonstructural measures are considered in developing possible alternative solutions to the flooding problems in the project vicinity. See Table Text 1. These measures are examined alone or in combination as alternative plans for their engineering and economic feasibility and environmental and social acceptability. Most were readily eliminated through preliminary evaluation.

2.03 The following plan concepts were considered in some detail but were not carried forward for final consideration or implementation.

2.04 Dam and Reservoir - A dam and reservoir alternative was given significant consideration in the DPR Investigation. Sites in the upper reaches of both the main and west branches of the creek were considered. Essentially, with this concept, a dam with flow control gates and a temporary reservoir area would be constructed in the upstream reaches of the watershed. During periods of potential flooding, water would be impounded in the reservoir area behind the dam reducing downstream creek flows and in turn the flooding potential. The retension capacity of the system, however, is dependent upon the available site location in the watershed. After the potential flooding conditions have passed, the impounded water would gradually be released to flow downstream.

2.05 Although it was determined that this could provide some flood damage protection benefits to the watershed, alleviating some problems in Manlius and Fayetteville, the retension capacity of such a system was not sufficient. The flood protection level would be relatively low (far less than for a 100-year event) and additional remedial measures would be required at each location (Manlius and Fayetteville) to sufficiently supplement flood protection needs. The estimated cost of this alternative far exceeded the funding limit set by the Section 205 study authority; the difference of which would have to be financed by the local sponsors. Construction of reservoirs under the Section 205 authority is limited to flood control only which is not justified. Additionally, environmental concerns, particularly of potential impacts to cultural resources and valuable fisheries habitat in the upper reaches of both the main and west branches, hindered further realistic pursuit of a dam and reservoir solution.

2.06 Flood Warning and Persons Evacuation - This concept generally requires the installation of a flood warning and signal device far enough upstream in the watershed to provide adequate time for temporary floodproofing measures and/or at least evacuation of residents from the floodprone area. Little flood warning time is possible at the Village of Fayetteville due to the very high stream flow velocities through the upper watershed. Additionally, institutional and social apprehensions about asking persons to leave their homes and businesses and about declaring a state of emergency make this plan unfavorable. The extent and diversity of the flood plain developments and the potential absence of reacting parties when the warning sounds, make this alternative inefficient and impractical. Significant flood related damages and health and safety hazards would be expected to continue. Although this alternative might be considered in some degree at the local level as a last resort; it was not considered for further detailed consideration in this study.

2.07 Floodproofing - This concept generally includes consideration of both permanent measures such as: sealing basement windows, raising foundations and structure, removal of items from basement, floodproofing furnace and utilities, ring levees/floodwalls, etc; and temporary measures such as: sandbagging, floodshields, etc. These measures, however, are best applicable to individual or small groups of structures. To provide this type of flood protection to the Fayetteville flood plain developments; approximately 120 residential, 20 multifamily, 52 commercial (including the mall), 2 industrial, and 2 public facilities would need to be floodproofed. The permanent floodproofing of all structures would be unrealistic while the planning, coordination, and time constraints of placing temporary shields (Reference - Flood Warning and Evacuation) would be impractical. Even if implementable, while flood damages might be partially reduced, community activities (business, work, access, transportation) would continue to be disrupted and community resources expended (emergency operations, clean-up). Although this measure was considered further on an individual level; as a whole, it was not considered for further detailed consideration in this study.

2.08 Relocation from the Flood Plain - With this concept, all of the existing developments within the project area 100-year event flood hazard area would be acquired or relocated and the residents relocated from the flood plain. This would involve the acquisition or relocation of approximately 120 residential, 20 multifamily, 52 commercial (including the mall), 2 industrial, and 2 public developments from the developed 130-acre flood plain area. This would directly affect approximately 900 people. Relocated residences and businesses would be re-established elsewhere, in non-floodprone areas of the surrounding communities. The evacuated flood plain area would then be restored to more natural or park-like conditions.

2.09 The estimated cost of this alternative greatly exceeded the funding limit set by the Section 205 study authority, the difference of which would have to be financed by the local sponsors. The natural environment in the flood plain area could benefit from the implementation of this plan since the creek area would be returned to more natural conditions, but adverse effects could occur from redevelopment in other areas of the community. Of predominant concern are the substantial complications and efforts required to implement

such a plan and the extensive community and social disruption that would occur with its implementation. Field interview and survey work indicate a relatively strong community cohesion for the area and relocation would not be socially favorable. This plan, therefore, was not considered for further consideration.

2.10 Channelization/Diversion - With this concept, generally the existing stream channel is deepened and/or widened and/or a new/additional channel is constructed to increase channel capacity to carry floodwaters through the protected area without overtopping the channel banks. This measure was considered for the Fayetteville project vicinity but was determined to be inappropriate for a number of reasons. (1) Significant channelization in the area would not be compatible with the continued operation of the Barge Canal dam and feeder canal. (2) The Lower Genesee Street bridge may need to be modified to eliminte its constriction to satisfy channel flow design capacities. (3) Development infringement restricts channel enlargement and/or diversion opportunities. (4) Significant channelization severely disrupts both the aquatic and riparian stream habitat which make channelization environmentally undesirable; particularly with good fisheries habitat in the area. Therefore, channelization, in itself, was not considered for further detailed consideration in this study.

2.11 Flood Insurance & Flood Plain Management - Both the Town of Manlius and the Village of Fayetteville participate via State policy in the Federal flood insurance program sponsored by the Federal Emergency Management Agency. This program begins with the mapping of lands with significant flooding potential. The maps delineate the frequently flooded (floodway) and flood pool areas of the 100-year flood plain. Additionally, after flood zone mapping is complete, local regulations relating to building within floodprone area (involving building restrictions and provisions for flood protection) are required as part of the Federal program. These policies are assumed for the future with project or without project future conditions. Although flood insurance would help to compensate for economic losses due to flooding, and flood plain management measures would help to prevent additional future flood damages; these measures do little to prevent flooding of existing developments and are not considered a final solution to the flooding problems in Fayetteville.

WITHOUT CONDITIONS (NO-ACTION)

2.12 Both the Town of Manlius and the Village of Fayetteville participate in the Federal flood insurance program. Although available flood insurance would serve to compensate for future flood damages, and flood plain management regulations will help to prevent future additional flood damages; these will do little to prevent existing potential flood damage.

2.13 Should no Federal action be taken to assist in addressing the flooding situation in the village of Fayetteville, it is expected that the existing potential for significant flooding and associated damages and community disruptions would continue. The local community has limited capabilities in addressing the problem alone. Although some local remedial measures might be expected (such as those taken after the 1981 flood), the effectiveness of these actions, although helpful, do not provide for a permanent solution. Additionally, these types of remedial actions would continue to require periodic expenditure of community, and in some cases (as after the 1981 flood) State and Federal resources. These actions would also, periodically disrupt the existing creek and riparian natural environments.

2.14 In the long-term, the rather extensive existing community developments although they would likely remain, could further deteriorate and portions could eventually even be lost due to recurring flooding. New and redevelopment will be more influenced by flood insurance and flood plain management policies. Under these policies, no structural development would be allowed in designated floodways and new or redevelopments in flood plain areas would require 100-year event flood protection. In addition to preventing future additional potential flood damage, these policies should help to conserve both aquatic and riparian natural habitats.

PLANS CONSIDERED IN DETAIL

2.15 After several iterations of plan formulation, assessment, and evaluation, the following plans had been identified for final detailed examination.

2.16 Plan - No-Action (Without Conditions) - This plan indicates that the Corps of Engineers acting for the Federal Government could take "no-action" based on an evaluation of the problems and possible alternative solutions as directed by the study authority. Without conditions would be anticipated with this alternative. This does not exclude possible action under referred authority or by other Federal, State, or local entities. The No-Action alternative is always a possibility and serves as the basis of comparison by which the other possible alternatives may be compared.

2.17 Although compensation for flood damages (after the fact), and prevention of significant additional future flood damages may be realized in the long-term under policies as set forth by the National Flood Insurance program; this plan would not satisfy the immediate primary planning objective of flood protection. Although the natural and cultural resources in the project area would not be directly significantly affected by this plan, flooding conditions would continue periodically to adversely affect most major parameters/aspects of the human environment in the project vicinity. Basically, this plan is socially unacceptable, unless no other feasible alternative is possible.

2.18 Plan 1 - Levee/Floodwall Protection - This concept involves utilization of levee structures, where possible, or floodwall structures, in constrictive areas, to prevent floodwaters from inundating the existing community floodprone developments. The floodwaters would, therefore, be confined to the existing stream channel and the remaining unprotected flood plain areas.

Although this concept is slightly more expensive to construct than the channelization alternatives, it is generally more environmentally acceptable because it significantly reduces adverse impacts to the stream aquatic and (if setback) riparian habitats. This basic concept was, therefore, further examined and developed as the most feasible concept for flood protection at Fayetteville, NY.

2.19 The plan formulated for the Fayetteville project vicinity consists primarily of providing 100-year event levee or floodwall protection to the existing community developments. Clearing and snagging measures would also be necessary to facilitate channel design capacity near and just south of the Route 5 - Genesee Street bridge. Approximate levee/floodwall alignments and other plan features are illustrated on Figure Text 1. Major plan features are described as follows.

a. For the stream reach south of the Limestone Plaza Street bridge, along the west embankments, a levee about 10 feet high with a 10-foot crown and 1V (vertical) on 2.5H (horizontal) sideslopes would be constructed. In constricted areas, retaining wall construction would be utilized to provide for continued vehicular acess around the apartment complex. The levee would run for approximately 1,600 feet; from high ground at the southern project limit, in alignment with the creekbank to high ground at the Route 5 - Genesee Street bridge. Riprap would be incorporated along the creekside portion of the levee to provide erosion protection. The earthen portion of this levee would be quickly vegetated with grass or legumes to prevent erosion. A levee of similar construction would be constructed between the Genesee Street bridge embankment and the Limestone Plaza bridge embankment (100± feet).

b. Due to limited area and necessary levee design features (i.e., size, slope, riprap), most west bank riparian vegetation must be removed, although levee setbacks, vegetation retention, and plantings (i.e., landscaping, dogwood, reed canary-grass) would be incorporated where possible. Reference the general vegetation retention and planting plan in the Environmental Appendices following this EIS. Some clearing and snagging - particularly of existing damaged or dead larger vegetation which could cause potential future jamming - will be required in the project area south of the Genesee Street bridge for about 1,600 feet along both sides of the creek banks.

c. For the stream reach south of the Limestone Plaza Street bridge, along the east embankment; a floodwall of driven sheet pile and concrete cap construction would be constructed. It would run from high ground just south of the Onondaga Tool Company for approximately 800 feet, between the creek and the Onondaga Tool Company and Stack's Animal Hospital, under the Route 5 - Genesee Street bridge, to high ground at the Limestone Plaza Street bridge. Its height would compare with corresponding levee heights. Riprap protection would be incorporated along the creekbank between the creek and the floodwall. Vegetation would need to be removed in this area.

d. For the stream reach north of the Limestone Plaza Street bridge, along the west embankment; a new levee would be constructed approximately 9 feet high with a 10-foot crown and sideslopes identical to those south of the bridge. It would run for approximately 1,800 feet; from the Limestone Plaza bridge embankment, in alignment with the creekside toe of the existing local levee, past the Sims Place residences to the existing Fayetteville Mall

concrete drainage ditch. A setback levee and riparian vegetation measures are more applicable in this area.

Riprap would be incorporated along the creekside portion of this levee to provide erosion protection. The earthen portion of this levee would be quickly vegetated with grass or legumes to prevent runoff erosion.

e. For the stream reach north of the Limestone Plaza Street bridge, along the east embankment, either a berm (700+ feet long) would be constructed near the creek or the surrounding properties would be backfilled and elevated to provide appropriate protection. Streambank riprap protection would be incorporated in this reach along the creekside of the new levee or (clean) backfill material. The earthen portion of the levee would be quickly vegetated with grass or legumes to prevent run-off erosion. The southern-most residence and garage would likely need to be acquired and razed and the residents relocated. See the following paragraphs also.

f. Three residences consisting of two houses and one trailer located immediately adjacent to the feeder canal would need to be acquired and/or relocated. The residents of the two houses would probably be relocated to alternate residences. The houses would then probably be razed and the basements and/or foundation filled, graded, and seeded. The trailer and residents would probably be relocated to a new site. Because of their isolated position within the flood plain, structural protection methods are not feasible. Relocation would probably easily be accomplished within the community. Acquisition and/or relocation would be accomplished in accordance with guidelines established by the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970." The town-owned structure housing a county family service center would be protected by the plan.

g. Internal drainage water would collect in small ditches located at the inside toe of the levee or floodwall structure, and flow to the lowest point along the structure. During normal conditions, the water would then flow through through a drain pipe (located perpendicularly through the levee or floodwall) and through a simple sluice gate and/or flapgated outlet, into the creek. During flooding conditions, the outlet devices would be closed preventing high creek waters from entering the protected areas through the drain pipe. During this period, internal drainage water would collect temporarily in small retention ditches designed for this purpose. After the high creek flows subside, the normal drainage process would again resume and the temporarily ponded water would drain.

2.20 This alternative is evaluated as being both engineeringly and economically feasible and, with appropriate environmental design measures, socially and environmentally acceptable. It best contributes to national economic development (NED) consistent with protecting the Nation's environment (EQ) purusant to national environmental statutes, applicable executive orders, and other Federal, State, and local planning requirements.

THE SELECTED PLAN

2.21 Based upon overall assessment and evaluation of the most feasible alternative plans in meeting the planning objectives and for engineering and economic feasibility and environmental and social acceptablity; Plan 1 - Levee/Floodwall Protection is identified as being the tentatively Selected Plan. Reference the System of Accounts and Plan Selection sections of the Main Report.

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TABLE TEXT-1
FLOOD DAMAGE REDUCTION MEASURES

Nonstructural Types - Modify damage susceptibility.

1. Installation of temporary or permanent closures for openings in structures.

2. Raising existing structures in-place.

3. Constructing new structures on fill or columns.

4. Constructing small walls or levees around structures.

5. Relocating or protecting damageable property within an existing structure.

6. Relocating existing structures and/or contents out of a flood hazard area.

7. Use of water resistant materials in new or existing structures.

8. Regulation of development of flood plain land by zoning ordinances, subdivision regulations, and building codes.

9. Acquisition of title or easement to flood plain land.

10. Flood Insurance.

11. Installation of flood forecast and warning systems with an appropriate evacuation plan.

12. Adoption of tax incentive to encourage wise use of flood plain land.

13. Placement of warning signs in the flood plain to discourage development.

14. Adoption of development policies for facilities in or near flood plain land.

Structural Types - Modify floods or reduce the frequency of damaging outflows.

1. Dams and Reservoirs - store flood waters to be released later.

2. Levees, dikes, and walls - confine flood waters.

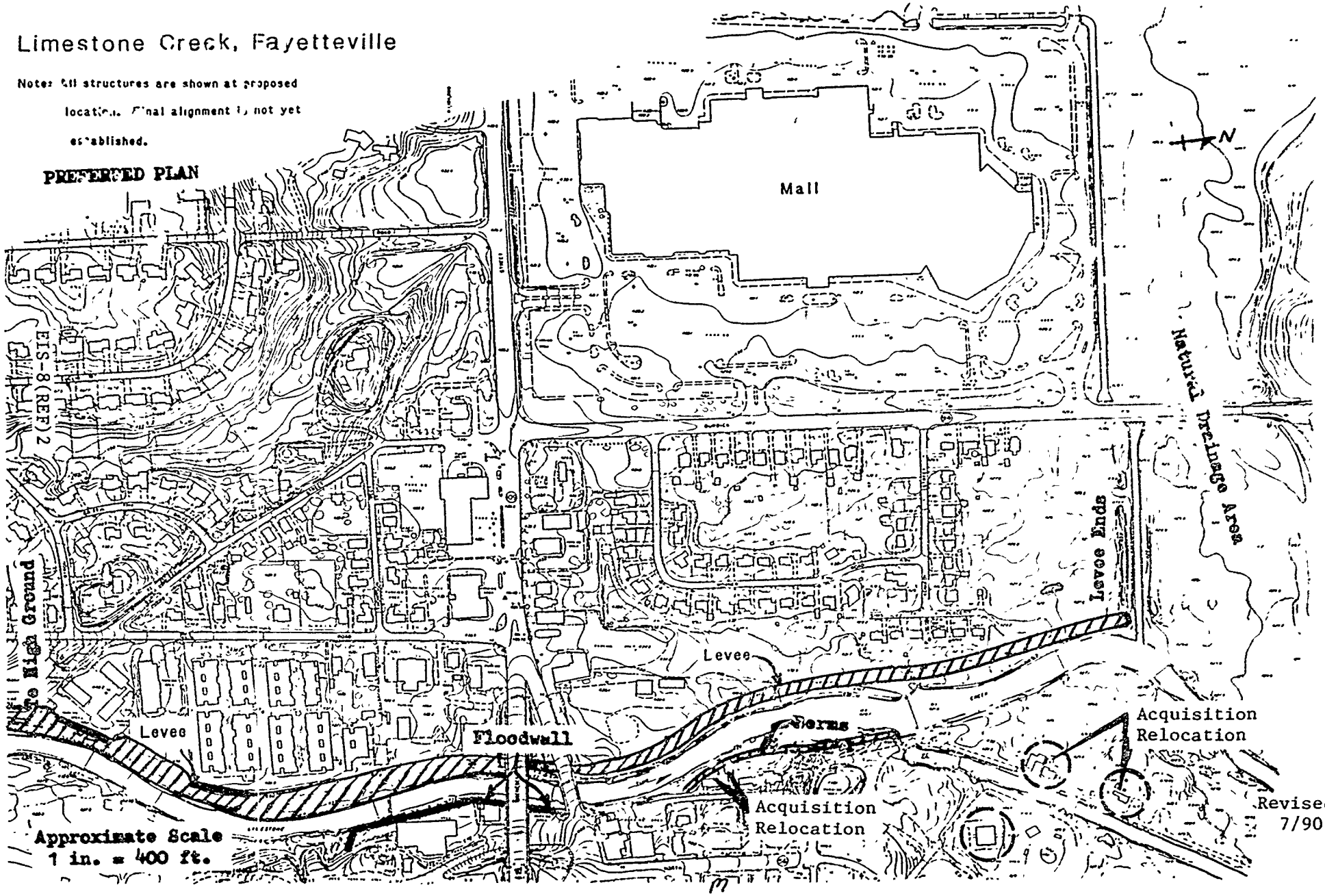
3. Diversions - pass flood waters around area.

4. Channel improvements, bridge modifications - improve channel to pass flood waters.

Limestone Creek, Fayetteville

Note: All structures are shown at proposed location. Final alignment is not yet established.

PREFERRED PLAN



LIMESTONE CREEK - FAYETTEVILLE

Table Text 2 - Comparative Impacts of Alternative Plans

Resource Parameters	Plan No-Action(Witout Conditions)	Plan 1 Levee/Floodwall Protection
Average Annual Benefit/Cost		
Benefits	0	$638,000
Cost	0	$268,600
B/C	0	2.38
Net Benefits	0	$369,400
Natural Environment (Natural Resources)		
Topography & Materials	ST: Minor Adverse LT: Minor Adverse Continued flooding and emergency/maintenance operations.	ST: Moderate Adverse LT: Minor Adverse 100-year levee/floodwall protection for about 130 acres of floodprone existing community developments. See Plan Figure Text 1 for alignments. Clear & Snag 1,600+-Feet (Bridge Area - south). Levee/Floodwall Construction 3,500-Feet 10 Acres (Levee) 52,250 C.Y. Earthern 26,389 C.Y. Riprap 600-Feet 1 Acre (Floodwall) 21,080 SF Sheetpile 306 C.Y. Concrete 2,000 Gal. Est. Fuel Consumption Local material sources. Initial construction altercation; project maintenance.

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Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action(Witout Conditions)	Plan 1 Levee/Floodwall Protection
Air Quality	ST: Not Significant LT: Not Significant Similar to existing conditions anticipated.	ST: Minor Adverse LT: Not Significant Some initial fugitive dust and exhaust from construction activities and equipment.
Water Quality	ST: Not Significant LT: Not Significant Similar to existing or slight improvement anticipated. Some minor disruption due to periodic channel maintenance.	ST: Minor Adverse LT: Not Significant Some initial increased sedimentation due to riprap and levee construction. Potential minor increase in water temperature due to some loss of shade vegetation. Some minor disruption due to periodic project maintenance.
Benthos	ST: Not Significant LT: Minor Adverse Continued disruption due to periodic flooding and maintenance channelization.	ST: Moderate Adverse LT: Minor Adverse Initial disruption due to project construction. Periodic project maintenance.
Vegetation	ST: Minor Adverse LT: Moderate Adverse Some periodic disruption to riparian vegetation due to continued flooding problems and maintenance channelization.	ST: Moderate Adverse LT: Moderate Adverse Initial disruption to riparian vegetation due to levee/floodwall/riprap construction and clearing and snagging. Levee area altered to grass and legume vegetation. Some minor disruption due to periodic project maintenance.
Wetlands	ST: Not Significant LT: Not Significant Wetlands near the project vicinity. Wetland development (>12.4 Acres) subject to NYSDEC review and permit.	ST: Not Significant LT: Not Significant No wetlands located in the immediate construction zone. No adverse impacts on this resource anticipated.

Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action (Witout Conditions)	Plan 1 Levee/Floodwall Protection
Fisheries	ST: Not Significant LT: Moderate Adverse Periodic disruptions due to continued flooding and maintenance channelization. Altered habitat.	ST: Moderate Adverse LT: Minor Adverse Temporary short-term disruption to the fishery during construction work. Long-term change in riparian vegetation shade cover along the west bank due to removal of tall existing vegetation, and reseeding the levee and disturbed soils above the riprap with a commercial herbaceous grass or glass/legume mixture. Riprap stabilization. Some minor disruption due to periodic project maintenance.
Wildlife	ST Not Significant LT Minor Adverse Periodic disruption of riparian habitat due to flooding problem and maintenance channelization. Only potential transient endangered species identified for the area. NYSDEC identified marsh north of Fayetteville fall as significant water fowl nesting area.	ST: Moderate Adverse LT: Minor Adverse Initial disruption to riparian habitat due to levee/floodwall/riprap construction and clearing and snagging. Herbaceous conversion to more open land type habitat food and cover.
Human Environment		
Flooding and Man-Made Resources	ST. Moderate Adverse LT: Major Adverse Continued flooding and associated damages. Some developments would be maintained; but some delapidated. Approximately 120 residential, 20 multifamily, 52 commercial (Mall included), two industrial, and two public structures within the 100-ye. event Fayetteville flood plain.	ST: Moderate Beneficial LT: Major Beneficial 100-year event level levee/floodwall flood protection to existing community developments. Approximate 130 acres. Protects approximately 120 residential, 20 multi-family, 52 commercial (Mall included), two industrial, and two public structures. Present/Future flood insurance program.

Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action (Witout Conditions)	Plan 1 Levee/Floodwall Protection
Community and Regional Growth and Development	ST: Moderate Adverse LT: Major Adverse Continued flood associated damages and community disruptions and flood emergency relief expenditures. Flood insurance and flood plain management policies to influence future developments.	ST: Moderate Beneficial LT: Major Beneficial 100-year event level flood protection to existing community developments. Flood emergency expenditures to be better expended elsewhere. Flood insurance and flood plain management policies to influence future developments.
Population and (Displacement of People)	ST: Moderate Adverse LT: Moderate Adverse Slight to moderate growth anticipated. Some continued displacement due to flooding problems.	ST: Minor Adverse LT: Moderate Beneficial Acquisition, relocation- homes, 1 trailer. 100-year event level flood protection to existing community developments and residences.
Land Use and Development	ST: Minor Adverse LT: Moderate Adverse Continued periodic flood damages to existing developments. Gradually altered mixed land use in floodprone area. New and redevelopment influenced by flood insurance and flood plain management policies.	ST: Moderate Beneficial LT: Major Beneficial 100-year event level flood protection to existing community developments generally preserving existing land use approximately 130 acres. Flood plain management policies to influence future developments.
Residential	ST: Minor Adverse LT: Moderate Adverse	ST: Minor Adverse LT: Moderate Beneficial

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Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action (Witout Conditions)	Plan 1 Levee/Floodwall Protection
	Continued periodic flood damages and disruption to existing residential developments. Approximately 120 residential and 20 family developments situated within the 100-year event flood plain.	Acquisition/relocation - 3 homes, 1 trailor. 100-year event level flood protection to existing residential developments. Approximately 120 residential and 20 multifamily developments situated within the 100-year event flood plain.
Business and Industry	ST: Minor Adverse LT: Moderate Adverse	ST: Minor Beneficial LT: Moderate Beneficial
	Continued periodic flood damages and disruption to existing businesses and industries. Approximately 52 commercial (Mall included), two industrial, and two public facilities situated within the 100-year event flood plain.	100-year event level flood protection to existing businesses and industries. Approximately 52 commercial (Mall included), two industrial, and two public facilities situated within the 100-year event flood plain. Plan implementation opportunities.
Employment and Income	ST: Minor Adverse LT: Moderate Adverse	ST: Minor Beneficial LT: Moderate Beneficial
	Continued disruptions to normal employment and incomes due to periodic flooding of existing businesses, industrial, and residential community developments.	100-year event level flood protection for existing community developments and associated employment and income protection. Plan implementation opportunities.
Recreational Opportunities	ST: Not Significant LT: Minor Beneficial	ST: Minor Adverse LT: Moderate Beneficial

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Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action (Witout Conditions)	Plan 1 Levee/Floodwall Protection
	Continued periodic disruption to fisheries and riparian habitat due to periodic flooding and channel maintenance actions - although fisheries would be expected to be sufficiently sustained. Some long-term related displacement of structural developments from the flood plain may improve opportunities for recreation and riparian access.	Initial disruption to fisheries and riparian habitats due to levee/floodwall construction and clearing and snagging. Temporary disruption to recreation fishing during late summer when on-site construction is occurring. Some loss in habitat quality south of the Lower Genesee Street bridge but environmental design measures to include some planting measures. Increased potential for fisherman access to the creek where designated along easement right-of-ways provided for future maintenance.
Agriculture (Displacement of Farms)	ST: Not Significant LT: Not Significant	ST: Not Significant LT: Not Significant
	No agricultural district has been identified in the immediate project area flood plain.	100-year event level flood protection to existing community developments generally preserving existing land use. No significant impacts to agriculture prime soil or displacement of farms expected.
Public Facilities and Services	ST: Minor Adverse LT: Moderate Adverse	ST: Minor Adverse LT: Major Beneficial
	Continued periodic flooding disruptions to community facilities and services. Long-term flooding associate displacement of community developments would decrease efficient use of existing facilities and services and require additional facilities and services, elsewhere.	100-year event level flood protection to existing community developments and facilities and services. Less long-term demand for flood emergency probles services. Some minor disruption of normal services and relocation of utilities during construction.

Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action (Witout Conditions)	Plan 1 Levee/Floodwall Protection
Property Values and Tax Revenues	ST: Minor Adverse LT: Moderate Adverse With continued flood potential, flood plain property values and developmental potential may continue to be slightly depressed. Potential tax revenues would also be decreased. Recommended flood insurance area for existing developments.	ST: Minor Adverse LT: Moderate Beneficial 100-year event level flood protection to existing community developments. Property values and associated potential tax revenue may be increased slightly. Need for extensive flood insurance substantially reduced.
Noise	ST: Not Significant LT: Minor Adverse Primarily traffic noise noted. No severe external noise problem noted or anticipated. Some noise associated with periodic channel maintenance.	ST: Moderate Adverse LT: Minor Adverse Noise associated with construction and movement of heavy equipment with plan implementation. Avoid movement through residential areas when possible. Some noise along creek and levee alignment associated with periodic project maintenance.
Aesthetics	ST: Minor Adverse LT: Moderate Adverse Community and creek aesthetics periodically disrupted due to flooding and clean-up and/or channel maintenance operations.	ST: Moderate Adverse LT: Minor Adverse Disruption to creek and construction area aesthetics due to construction and plan implementation. Views to creek further disrupted due levee or floodwall obstruction. May be partially mitigated, however, through landscaping and planting efforts.

Table Text 2 - Comparative Impacts of Alternative Plans (Cont'd)

Resource Parameters	Plan No-Action (Witout Conditions)	Plan 1 Levee/Floodwall Protection
Community Cohesion	ST: Moderate Adverse LT: Moderate Adverse Surveys and interviews indicate strong community cohesive forces, however, continued periodic disruption due to periodic flooding and associated problems.	ST: Moderately Beneficial LT: Moderately Beneficial 100-year event level flood protection to existing flood prone community developments and residents. Overall favorable reaction. Some environmental and cost allocation concerns.
Cultural Resources	ST: Not Significant LT: Not Significant Reconnaissance survey indicated no significant cultural resource items identified for the immediate project area.	ST: Not Significant LT: Not Significant Reconnaissance survey and review by appropriate cultural resource agencies indicate that no significant adverse effect to cultrual resources should occur due to plan implementation.

NOTE: ST: Short-Term Impacts
LT: Long-Term Impacts

LIMESTONE CREEK - FAYETTEVILLE, NY

SECTION 3 - AFFECTED ENVIRONMENT

INTRODUCTION

3.01 This section will briefly describe the study area existing and without conditions.

ENVIRONMENTAL CONDITIONS (GENERAL)

3.02 The Limestone Creek watershed drains approximately 169 acres of land in Onondaga and Madison Counties, NY. The main branch of the creek flows westward from its source in northern Madison County till it joins the DeRuyter Reservior outlet and then northward through the Villages of Manlius, Fayetteville, and Minoa to its confluence with Butternut Creek, a distance of about 34 stream miles. The west branch flows northward from its source in the Town of Pompey to its confluence with the main branch in the Town of Manlius, a distance of about 10 stream miles. See Reference Figure 1.

3.03 The upper part of the watershed, above the Village of Manlius, is primarily rural, with forested, rolling hills bordering the creek valley which varies from about 1/2 to 1 mile wide in the section between Delphi Falls and Edwards Falls. Limestone Creek meanders through this relatively flat area which is characterized by agricultural croplands, pasture and hay fields, abandoned farmland in varying stages of succession, densely wooded areas, and wetlands. The West Branch between Watervale and the Village of Manlius follows a more direct course through a narrow flood plain. The hilly terrain bordering the West Branch is generally agricultural, woodland, and openland.

3.04 The lower part of the watershed is suburban in character. Limestone Creek flows through the Villages of Manlius, Fayetteville, and Minoa before joining Butternut Creek. Although there is considerable commercial and residential development in this section, there are many wooded, open, and wetland areas along the creek and within the flood plain. Limestone Creek from its source to the Village of Fayetteville (including the west branch) is recognized by New York State as one of the top 50 trout streams in the State.

3.05 The village of Fayetteville is located in the town of Manlius about 7 miles south east of the city of Syracuse in central New York State. The village is primarily residentially and commercially developed. Growth is influenced by proximity to the Syracuse metropolitan area and N.Y.S Route 5 which passes through the village. See Reference Figures 1, 2, & 3. While the town population has grown (9 percent) from 26,100 in 1970 to 28,489 in 1980, the village of Fayetteville actually decreased (6 percent) in population from 5,000 to 4,709 for that same period. The greatest increases in land use for the town and village have been for commercial and residential developments; while open and agricultural lands have decreased accordingly. These trends are expected to continue for the near future, but at a more moderate rate.

3.06 Limestone Creek flows south to north through the village of Fayetteville. Reference Figure 3. The creek south of the Route 5 bridge is of steeper gradient with riffle and pooling areas. Existing riparian vegetation also provides streambank cover and shading to provide for an excellent cold water (trout) fishery habitat. The creek continues downstream to the pool behind the State dam which is used to supply the Feeder Canal for the Old Erie Barge Canal. Below the State dam, the channel slope is flat and the creek is slow moving. Therefore, within Fayetteville, the creek changes from a swift moving stream to a tranquil stream and is an area of transition for the creek.

3.07 The geography and topography, besides affecting the type of flow regime also affects the type of flooding and land use in the surrounding area, see Reference Figure 3. The right or east bank of the creek in the study area is moderately sloping upwards towards the east where there is a northerly extension of the Appalachian Upland, thus allowing for a very narrow flood plain on the east bank. The left or west bank, in contrast, has only a slight upward slope allowing for an expansive flood plain before reaching higher ground to the west. Fayetteville proper developed mostly on the high ground to the east of Limestone Creek. Although most development occurred east of the creek, considerable commercial development occurred on the west flood plain in the early 70's, including a multi-million dollar shopping mall. Development of the west bank was diminished during the late 70's when Federal guidelines for flood insurance and flood plain management were put into effect.

3.08 The environmental setting is that of urbanized landscape consisting of both vegetation and structures. North of Genesee Street on the west flood plain, there are some undeveloped areas along the stream that are in a relatively natural state. These areas are between Warner Road and Limestone Creek north of the shopping center and Kennedy Street. Moving west, there are residential properties up to the west side of Burdock Street where the shopping center is located. Along Genesee Street on the west flood plain, there is a commercial strip including the shopping center. The area south of Genesee Street on the west flood plain is primarily multi-family housing along the stream with single-family housing taking over to the west thereof. On the narrow east flood plain, there are several commercial and residential properties, one manufacturing establishment and 2 public facilities; the remaining development is on the upland.

3.09 The topography, an expansive flood plain, having limited channel capacity, makes the Fayetteville area susceptible to flooding which occurs both in summer from excessive rainfall, and in winter from a combination of snowmelt and rainfall. Flooding to some degree occurs yearly and documented flooding goes back to 1989. The last recorded flooding took place in October 1981 when Kennedy-Sims Place and Burdick area streets were flooded and water nearly entered the Fayetteville Mall development. This was identified as a 25-year flood event.

3.10 In 1980, an estimated 120 residential, 20 multi-family, 52 commercial (including the shopping mall), two industrial, and two public structures occupy the Limestone Creek 100-year flood plain. Less than 5 percent of

those structures occupy the right bank; the remainder occupy the left bank where there is the most extensive flood plain and where the majority of flooding occurs. The majority of the flood damage is to commercial properties. Flood damages from a 100-year event, based on current conditions, would total approximately $18 million. Project estimated average annual flood damage is about $688,000. The large amount of average annual damages is due to the large number of structures in the flood plain and the multi-million dollar damages expected from rarer storms.

3.11 Both the town of Manlius and the Village of Fayetteville participate through state policy in the national flood insurance program. Once the program policies and zoning measures are fully implemented and properly enforced; future development of unprotected structures should be limited in the flood plain (100-year) and potential significant flood damages to any additional future developments should be greatly reduced.

SIGNIFICANT RESOURCES:
EXISTING AND FUTURE CONDITIONS

3.12 The following parameters were assessed for this project but were identified as not being significantly impacted by implementation of any of the most feasible alternative plans. These include: Air Quality, Agriculture, Displacement of Farms, Wetlands, Endangered Species, and Cultural Resources.

3.13 The following parameters were assessed for this project and were identified as being significant resources in the study area, and may be subjected to impacts of some significance by implementation of any of the most feasible alternative plans. These include: Topography and Materials, Water Quality, Benthos, Vegetation, Fisheries, Wildlife, Flooding and Man-Made Resources, Community and Regional Growth, Business and Industry, Employment and Income, Recreational Opportunities, Public Facilities and Services, Property Values and Tax Revenue, Noise, Aesthetics, and Community Cohesion.

3.14 Sections 3.15 through 3.74 briefly describe existing and anticipated future conditions for the natural, human, and cultural resources affected environments. Each section first describes general regional characteristics then where necessary, characteristics more specific to the immediate project area. Reference Figures 1, 2, and 3.

NATURAL ENVIRONMENT - EXISTING/FUTURE CONDITIONS

3.15 Topography and Materials - Onondaga County's topography is varied and picturesque. The plain to the north is extremely flat and is characterized by numerous freshwater wetlands varying in size from a few acres to over 5,000 acres. The southern upland is characterized by a series of well-defined stream valleys flanked by steep forested slopes running in a north-south direction. This, in conjunction with the numerous lakes, creates several scenic corridors and vistas. The largest lakes in the County include Skaneateles and Otisco Lakes in the southwest, Oneida and Cross Lakes in the northeast and northwest respectively, and Onondaga Lake in the central portion of the County adjacent to the City of Syracuse. A large number of unique land formations are found in the County, the result of glacial action.

Drumlins are characteristic of the midsection of the County between the Northern Lowlands and the Southern Uplands.

3.16 The major mineral resources available in Onondaga County include limestone, sand, gravel, and salt. Historically, it was the salt deposits that contributed to Syracuse's growth. Limestone, sand, and gravel are essential for urban growth - primarily for the construction of modern highways and buildings. The County is the largest producer of limestone in the Region. Both the salt deposits and the limestone are plentiful and are extensively used in local industrial processing.

3.17 Air Quality - The New York State Department of Environmental Conservation (N.Y.S.D.E.C.) has classified the area in which the project is located as Level II air quality. The level II classification is indicative of predominantly single and two family residences, small farms, and limited commercial services and industrial development. (Title 6, Official Compilation of Codes, Rules, and Regulations of the State of New York, Subchapter A of Chapter III, Environmental Conservation Law, Air Resources).

3.18 Although moderate pressure for future similar type developments is expected to continue in the project vicinity, these types of developments would not be expected to significantly alter the air quality standards for the project vicinity. The ambient air quality data for the Fayetteville locale meets or is within the allowable maximum Federal and State standards for total suspended particulates, sulfer dioxide, carbon monoxide, ozone, nitrogen dioxide, lead, sulfates, and nitrates as indicated by NYSDEC (memorandum on Quarterly Evaluation of Ambient Air Quality and Compliance with Ambient Air Quality Standards NYSDEC 1983).

3.19 Water Quality - The New York State Department of Environmental Conservation assigned classifications and quality standards for the waters of Limestone Creek according to best usage. The Main Branch from the source to the outlet of Pond 138a (the reservoir upstream from Edwards Falls) is classified as B(t). Class B waters are suitable for primary contact, recreation, and other uses except as a source of water supply for drinking, culinary, or food processing purposes. The symbol (t) means that these waters are trout waters and the dissolved oxygen specification of not less than 5.0 ppm applies. The stream in this area is flowing through a primarily rural and forested country side where pollution is limited to agricultural and small residential sources.

3.20 From the outlet of pond 138a, to the New York Route 5 crossing in Fayetteville, the waters are designated C(t). Class C waters are suitable for fishing and any other uses except primary contact recreation and as a source of water supply for drinking, culinary or food processing purposes. The stream in this area is flowing through some rural areas, the Village of Manlius, and part of the Village of Fayetteville.

3.21 The West Branch, which converges with the Main Branch in the Village of Manlius also carries a C(t) water quality classification for its entire length. Like the upper reach of the Main Branch, it also is flowing through a primarily rural and forested country side.

3.22 From the New York Route 5 crossing to the mouth of the main branch at the confluence with Chittenango Creek, the waters are designated C. Water quality in this part of Limestone Creek reflects the discharges from the Meadowbrook-Limestone sewage treatment plant and the Minoa Village sewer treatment plant.

3.23 Less developmental pressure is expected in the upper reaches of the watershed. This, and increased public concern for maintaining the valued quality of the aquatic resources in these reaches, would indicate potential for less impact on creek water quality in the upper reaches of the Main and West Branches of Limestone Creek for the project future. With some further development in the vicinity of the Villages of Manlius and Fayetteville, water quality in the middle reaches of the Creek may decrease slightly due to increased effects of urban run-off. The water quality classification in this middle reach however, would not be expected to change in this area for the project future. Similar development effects would be expected in the reach downstream from Fayetteville. However, as a result of the recent and planned improvements in waste water treatment, improvement in water quality in this section of the creek is anticipated.

3.24 Benthos - Limestone Creek supports a variety of benthic organisms which is indicative of the known excellent viable trout fisheries which the creek supports. Primary benthos information specific to the project areas was collected by the U.S. Fish and Wildlife Service and Corps personnel while conducting detailed biological field studies during 1982. See Fisheries also. During this study, at least sixty-eight different invertebrates from thirty-five different groups were identified and listed. Flies and midges as a group made up 44 percent of the invertebrate population (midges accounting for 36 percent and black flies for 7 percent) followed by crustaceans at 22 percent, mayflies at 13 percent, caddisflies at 13 percent, mollusks at 4 percent, and worms at 2 percent. Scuds, crayfish, stoneflies, mayflies, caddisflies, black flies, and midges were collected at nearly every Mainstream and West Branch station. Crayfish were observed at every Mainstream and West Branch station except Station MS16 based on field observations. Overall 2,769 invertebrates were collected from the study area which is an average of 151 individuals per station sampled. Reference Table 3.

3.25 Similar stream channel configuration, in-stream structure and substrate, variable instream flow regime, water quality, aquatic and riparian vegetation, and forage base would continue to provide for a superb aquatic habitat and benthos population in the upper and middle reaches of Limestone Creek. Any significant alteration to these criteria, however, could in turn adversely affect the benthos populations in the altered areas. In the upper reaches of the creek, where developmental pressures are less; alteration to the aquatic environment and associated adverse impacts would be less likely. Disruptions and/or alterations in the middle reach of the creek, however, would be more likely. Continued periodic flooding problems in the Villages of Manlius and Fayetteville could result in further emergency or maintenance restoration and flood damage reduction actions (some clearing and snagging, channelization and minor levee and berm reconstruction) similar to those initiated locally after the 1981 flood. These actions, in addition to any adverse effects caused by the flood itself,

resulted in some immediate short-term adverse impacts. Benthos in the immediate construction and downstream area were either destroyed or disrupted due to increased in-stream siltation, removal of vegetation, substrate excavation, and alteration of existing channel configuration. These disrupted areas will eventually reestablish to some degree with the natural stream recovery process. Overall, however, although probably not to the degree of the pre-action condition, the area benthos would likely reestablish over the long term; this likelihood is reinforced by the presence of abundant benthos species identified in the 1982 fisheries field study which was conducted during and soon after the emergency construction action.

3.26 Vegetation - Lands adjacent to Limestone Creek - including the West Branch, in the upper part of the watershed above the Village of Manlius - are predominantly agricultural croplands, hayland, pasture land, abandoned farmland (in various stages of plant succession), woodland, and some wetland. The lower sections of the watershed encompass the developed areas of Manlius, Fayetteville, and Minoa, and also include active and abandoned farmland, wooded areas, and wetlands. The entire length of the creek is bordered by a nearly continuous band of riparian vegetation which provides wildlife habitat and stream cover. Along most of the creek, this riparian growth remains intact despite the agricultural, residential, and commercial development. The creek banks are typically tree lined with interspersed shrubs and herbacious understory. Species noted during field observations along the creek include black silow, box elder, cottonwood, red maple, slippery elm, sycamore, black locust, dogwood, sumac, choke cherry, creeping cucumber, goldenrod and teasel. Wooded areas on the surrounding hillsides are predominantly northern deciduous hardwoods with scattered conifers. (U.S.F.&W.S.-P.A.L.- 29 February 1980).

3.27 Change in terrestrial vegetation is generally relative to change in land use. Natural vegetation is usually, partially, or completely removed to facilitate most types of land use activities. However, where possible, a narrow bank of riparian vegetation may be left along the creek, primarily as natural stream bank stabilization. In the upper reaches of both the Main and West Branches at Limestone Creek - with less development pressures and desired preservation of existing aquatic resources in the area - land use adjacent to the creek and riparian vegetation would be expected to be similar to existing conditions for the project future. In the middle reach, near the Villages of Manlius and Fayetteville for the most part, a narrow band of riparian vegetation would probably remain intact. In some areas, however, expanded developments (i.e., parking lots, small berms) could further infringe upon this vegetation. Some riparian vegetation might also be removed in these areas, if flooding continues periodically, and further emergency or maintenance restoration and flood damage reduction actions (clearing and snaggng, channelization, and minor levee and berm reconstruction) similar to those implemented after the 1981 flood are required. Further development and proper implementation and enforcement of flood insurance and flood plain management measures would contribute toward preserving riparian vegetation in the future.

3.28 Wetlands - Within the Limestone Creek drainage basin, there are about 3,100 acres of wetland, with the largest having an area of about 450 acres

known as Kirkville swamp. Kirkville swamp is an extensive wetland area located north of the Old Erie Canal in the town of Manlius. This swamp consists of mostly flooded live deciduous trees with some emergent and open water areas. The New York State Department of Environmental Conservation (1970) described this swamp as having moderate waterfowl and furbearer importance.

3.29 In Onondaga County, the Environmental Management Council (EMC) has prepared a fresh water wetlands inventory and maps for the county. The locations and types of wetlands within the study areas are shown on these maps. The predominant wetland types occurring in the watershed include flooded live deciduous trees, flooded shrubs, and wet meadow. There are also numerous emergent and open wetlands. Less common types include flooded dead trees and flooded conifers. To protect the natural assets of these wetlands (larger than 12.4 acres), their use is now regulated by the States' Department of Environmental Conservation. Also, discharge of dredged or fill material into wetlands adjacent to waters of the United States are regulated by the U. S. Army Corps of Engineers under Section 404 of the Clean Water Act.

3.30 Reference Figure 4 depicts wetland areas and types in the immediate project vicinities as mapped by the (EMC). Several wetland areas have been identified in the vicinity of the Fayetteville project area. There is a 110 acre cattail marsh which is listed as significant by NYSDEC (phone communication 25 April 1983). This marsh is the third largest cattail marsh in Onondaga County and is significant as a waterfowl resting area. This wetland is adjacent to the Fayetteville Mall north of Route 5.

3.31 Fisheries - The U.S. Fish and Wildlife Service and the New York State Department of Environmental Conservation report that about 27 miles of the Main Branch of Limestone Creek - from tributary 5 in the Village of Fayetteville to the source - supports a high quality cold water fishery and has been placed among the top 50 trout streams in New York State. The entire length of the West Branch also supports a cold water fishery. Excellent stream cover and fisheries habitat are found along these reaches. A nearly continuous band of riparian shrubs and hardwoods provide cover that help to maintain stream temperatures. The stream bottom is gravel and rubble with larger rocks and boulders providing riffle and pool areas. Gravel shoals provide areas for spawning. The stream width is generally about 25 to 30 feet, with depths varying from a few inches to several feet. The lower section of Limestone Creek below Fayetteville is characterized by a deeper, wider channel (up to 60 feet across) with tree lined banks. This section is more characteristic of a warmwater fishery, although trout have been found between the New York Route 5 crossing in Fayetteville and the Barge Canal. In 1983 the NYSDEC reported collection of common shiner and wild brown trout young-of-year below the Feeder Dam. (USF&WS - Planning Aid Letter (PAL) - 29 Feb 80).

3.32 Stocking information for 1978 was provided by NYSDEC. The Main Branch between Butternut Creek and Delphi Falls was stocked with the following: 12,300 brown trout yearlings, 972 brook trout yearlings, and 520 rainbow trout spring fingerlings. The West Branch between the mouth and Watervale was stocked with 2,400 brown trout fall fingerlings. Stocking efforts for

1979 were about the same and a similar program is planned to continue for these sections in the future. (USF&WS - PAL - 29 Feb 80). In general, Onondaga County has a yearly stocking program on Limestone Creek. NYSDEC issues the County an annual permit to stock approximately 19,500 brown trout yearlings between Tributary 5 in Manlius and Tributary #37 DeRyder Reservoir; at times some rainbow trout are stocked (Corps telephone communication with NYSDEC, Cortland, NY on 23 February 1984).

3.33 In 1982, the U.S. Fish and Wildlife Service working with the Corps of Engineers evironmental personnel conducted more detailed biological baseline (primarily fishery and benthos) studies specific to the project vicinities (Manlius and Fayetteville). The 5.5 miles of the Main Branch and 1.44 miles of the West Branch in the studied areas are bounded downstream by the Feeder Canal Dam in Fayetteville, and upstream by Edwards and Brickyard Falls respectively. Based upon this study, the U.S. Fish and Wildlife Service stated in their January 1983 report:

> "...it would appear that from a biological standpoint the Mainstream and West Branch of Limestone Creek upstream of the Feeder Dam and downstream of Edwards and Brickyard Falls are important viable resources, particularly for trout and associated species. Additionally, two tributaries, Tributary Nine and the West Branch Tributary north of NYS Route 173, provide spawning and nursery area for trout which use the area described above. Moreover, it would appear that Bishop Brook, another tributary, also supports an indigenous trout population. The importance of these areas is further enhanced by their occurrence within a highly urbanized area such as that presented by the Fayettevile-Manlius, New York area...."
>
> "...The areas not mentioned above are also important. The area downstream of the Feeder Dam supports it's own population of organisms. The single trout taken at Station MS15 is conjectured to have passed over the Feeder Dam inadvertently. This area and others, particularly those upstream of the Feeder Dam, in the presence of sufficient flow provide nursery area for prey species and resting and feeding area for all fish species. Additionally, the value of this area is not limited to just the fish species found within the stream, but to all organisms found in the study area or which pass through at any given time..."

3.34 Brown and rainbow trout are reported to be present in the Limestone Creek project area both by the NYSDEC and USF&WS. Recent contact with NYSDEC, Cortland, New York indicates continued stocking of brown and rainbow trout. In addition to trout other fish species collected by the USF&WS during sampling in 1982 include chain pickerel, cutlips minnow, bluntnose minnow, blacknose dace, long nose dace, creek chub, fallfish, pearl dace, white sucker, northern hog sucker, stonecat, banded killifish, rock bass, pumpkinseed, fantail darter, mottled sculpin, and slimy sculpin. Based on the field fishery

sampling, the ratio of trout to non-trout species varies from 1:1 in the tributaries to 1:25 in the Main Branch. Reference Tables 1 and 2. Additionally, in 1983 the NYSDEC reported collection of common shiner and wild brown trout young-of-year below the Feeder Dam.

3.35 While there is no formal fisherman access in the project area or the area influenced by it, informal access is obtained at the several road crossings, the creek levee, and some private properties. A specific number of angler-use days is unavailable; however, fishermen were observed by USFWS personnel during the 1982 field studies. (USF&WS - DCAR - 8 Apr 83).

3.36 The quality of the cold-water fishery resources in the upper and middle reaches of Limestone Creek are well known (particularly by the State of New York) and continued significant efforts to preserve this resource would be expected. A continued significant complimentary stocking program is also anticipated. In preserving this resource, the excellent physical characteristics and quality of the stream which provide for the superb aquatic habitat and fishery population must be sufficiently preserved. Any significant alteration to these criteria could in turn adversely affect the fisheries of the creek. In the upper reaches of the creek - with lesser structural developmental pressures anticipated - the aquatic habitat can be more readily preserved, and conditions similar to those that now exist would be expected for the project future. In the middle reach of the Creek which flows through the Villages of Manlius and Fayetteville, some other developmental pressures would be expected which could adversely affect the aquatic habitat and thus the fisheries in the area (i.e., increased urban run-off, removal of riparian vegetation). Also, with continued periodic flooding problems, emergency or maintenance restoration and flood damage reduction actions (some clearing and snagging, channelization and minor levee and berm construction) similar to those inacted after the 1981 flood, might occur. This would periodically disrupt and adversely affect the aquatic environment, and therefore the fisheries. Although overall, the fishery and benthic resources in the creek would be expected to recover in the long-run to some degree from disruption caused by these structural measures, the quality of aquatic habitat in the project zone would probably be decreased. Further implementation and proper enforcement of flood insurance and flood plain management measures would serve to preserve the creek's remaining aquatic environment, and in turn the fisheries regime, by detering significant additional structural developments in the floodway and flood plain.

3.37 Wildlife - There have been no known recent detailed surveys of wildlife conducted within the immediate project areas. However, Alexander (1974) listed 266 bird species, 52 mammal species, and 39 species of reptiles and amphibians present or known to have been present in Onondaga County. The riparian, openland, woodland, and wetland areas throughout the Limestone Creek watershed provide suitable habitat for many of the species listed. The nature of the narrow band of riparian vegetation along the banks of the Mainstream, West Branch, and Tributaries of Limestone Creek provide excellent habitat for a variety of wildlife. Additionally, it provides a valuable corridor for wildlife that venture through the area to surrounding resting, breeding, and feeding areas. These functions enhance its value. Some wildlife species observed during 1982 field studies included: white-tailed deer, raccoon, muskrat, eastern cottontail rabbit, mallard duck, crow, and other avians.

3.38 The presence of wildlife is largely dependent upon the existence of suitable habitat, which in turn is related to land use and activities. In the upper reaches of Limestone Creek, with lesser developmental pressures anticipated although some wildlife may be displaced and some habitat area lost due to limited developments - the situation would be expected to remain similar to that which presently exists. Some re-emergence of field and shrub vegetation on abandoned or idle farmland would probably even improve conditions. In the middle reach of the creek, in the vicinities of Manlius and Fayetteville, some further development or redevelopment may contribute toward additional displacement of wildlife and reduction of habitat. With further development of flood insurance and flood plain management measures, however, this adverse type impact in the immediate flood plain areas might be expected to moderate in the future.

3.39 Protected Species - In compliance with Section 7 consultation under the Endangered Species Act 187 Stat. 8 84, as amended; 16 U.S.C. 1531 et. seg., correspondence from the U.S. Fish and Wildlife Service dated 16 February 1984 stated that except for occasional transient species (Bald Eagle, Peregrine Falcon, Arctic Falcon, Indiana Bat), no Federally listed or proposed threatened or endangered species their jurisdiction are known to exist in the project impact area.

3.40 Under New York State law, endangered species, and a number of non-endangered fish and wildlife are protected at various levels. A species found in the wild which is completely protected may not be pursued, killed, hunted, fished, trapped, or otherwise harrassed at any time for any purpose except by special permit. New York State endangered species are completely protected. The Bald eagle and Peregrine falcon may make transitory use of the area, however, there are no populations of New York State endangered species known to occur within the study locale. In general, all bird species in the State are completely protected by the New York State Conservation Law except rock dove, starling, house sparrow, Psittacidae (family of Parrot) birds, and those species which may be legally harvested during the prescribed hunting season. The wood turtle is also listed as completely protected. A Fish and Wildlife Service biologist recently reported sighting this species in bottomland hardwood and riparian habitat along Butternut Creek. This species of turtle inhabits water areas, but it may also wander through terrestrial woodlands, meadows, and farmland habitats. Although this reptile may occur in the general vicinity of Limestone Creek, none were observed in the Fayetteville project area.

3.41 Note Paragraph 3.30, also.

HUMAN ENVIRONMENT - EXISTING/FUTURE CONDITIONS

3.42 Flooding and Man-Made Resources - Reference paragraphs 3.02 through 3.11.

3.43 Community and Regional Growth and Development - The followinng sections discuss in more detail parameters pertaining to community and regional growth and development:

3.44 Population - Reference Table 4 depicts some general population characteristics for Onondaga County, the Town of Manlius, and the Villages of Manlius and Fayetteville based on 1980 census data. In the Town of Manlius, a majority of the population (79 percent) reside in urbanized areas. The population is predominantly white (7[illegible] percent); 52 percent male, 48 percent female; with a median age of 32 and approximately 9 percent of the population at 65 years of age or older. Population characteristics for the Villages of Manlius and Fayetteville are fairly similar. See Table 4.

3.45 Reference Table 5 depicts the past, present, and projected population figures for the County, Town, and Villages of Manlius and Fayetteville. The table indicates that rather than a slight increase in population, the County actually experienced a slight loss in population between 1970 and 1980. While the Town of Manlius experienced some growth during that period, it was slightly less than expected. The same is true for the Village of Manlius. The Village of Fayetteville experienced a slight loss for that period. Generally, moderate population growth is expected for the vicinity. Reference Tables 6 and 7 - 1980 OBERS - B.E.A. Regional Projections; which depicts projected population, employment, and income for the Syracuse, NY Standard Metropolitan Statistical Area also.

3.46 Land Use and Development - Reference Table 8 depicts existing and projected land use (in acres) for Onondaga County and the Town of Manlius. Reference Figures 5A, 5B, and 5C depict existing and anticipated future land use areas in the project vicinity of the Town of Manlius.

3.47 The primary area for growth in Onondaga County is in the north, with lesser growth in the east and west and little growth in the southern portion of the County. This growth pattern is largely attributed to the influence of the Syracuse metropolitan area. In the eastern portion of the County, the Town of Manlius is the residential growth area, primarily around the villages of Manlius and Minoa. Commercial growth was largely concentrated in the Fayetteville Mall located immediately west of the Village of Fayetteville. Industrial development has been light in the town of Manlius for the past few years. Transportation, recreation, and institutional land uses have increased while agricultural and openland use generally declined in response to development activity.

3.48 The trends observed during the last few years are expected to continue over the next twenty years. In the Town of Manlius, moderate growth in residential and commercial and slight growth in transportation and industrial land use is expected. Recreational land use should remain relatively stable, while agricultural and openland use are expected to decline relative to development activity. Reference Table 5.

3.49 In the immediate Fayetteville project vicinity, the flood hazard area is extensively developed. As noticable on Reference Figures 3 and 5C approximately 1/2 of the 200-acre project area flood plain is developed residentially, 1/4 is developed commercially, and 1/4 is undeveloped. There are an estimated 120 residential, 20 multi-family, 52 commercial (including the shopping mall), two industrial, and two public structures which occupy the Limestone Creek 100-year event flood plain in the Fayetteville vicinity. This area provides housing for approximately 500 residents, employment for approximately 600 persons, and services to the entire community.

3.50 With respect to flood plain developments, in accordance with State policies, both the town of Manlius and the village of Fayetteville participate in the Federal flood insurance program sponsored by the Federal Emergency Management Agency. Under this program, flood insurance and flood plain management policies will help to compensate the communities and its residents for flood damages and help to reduce the potential for flood damages to any future community developments. This is a long-term program, however, and does little to protect many existing community flood plain developments from sustaining periodic flood damage and disruption. In most cases, these existing flood prone developments are important to the community functional base, growth, and well being. Therefore, many communities (with limited resources) express their desire to protect these existing developments (where possible) by requesting assistance through their local and Federal representatives. The general desirable developmental trend has therefore become: to protect significant existing community and regional developments where feasible and environmentally acceptable and to promote improved flood plain land use management practices for the future.

3.51 Despite the extensive development in the project area flood plain, the creek maintains significant fishery resources value. The main branch of Limestone Creek from its source to the Feeder Canal at Fayetteville is recognized as one of the top 50 trout streams in New York State. The area downstream of the Feeder Canal is more characteristic of a warm water fishery and supports its own population of organisms. This induces noticable fishing activities along the creek.

3.52 Residential - Table 9 depicts general housing characteristics for Onondaga County, NY, the Town of Manlius, and the Villages of Manlius and Fayetteville. In the Town of Manlius, approximately 98 percent of the year-round housing units are occupied and only 2 percent vacant. Most of the year-round housing units are in good condition, approximately 99 percent with complete plumbing and a median value of approximately $50,000 (1980). Median contract rent for specified renter - occupied housing units paying cash rent is $233. Housing characteristics for the Villages of Manlius and Fayetteville are similar.

3.53 Based on a 1980 survey, there are about 120 residential and 20 multi-family housing units situated in the 100-year event flood plain in the Fayetteville vicinity. Single home housing structures in the project area flood plain range in value from approximately $10,000 to $70,000 with an average (mean) value of approximately $27,500. They range in age from about 5 to 80 years old with an average (mean) age of about 45 years and an average (mode) age of about 30 years old. The multi-family housing structures range in value from approximately $22,000 to $322,000 with an average (mean) value of approximately $155,000. They range in age from about 2 to 80 years old with an average (mean) age of about eight years. Most, however, are either about two or ten years old. These structures provide residences for approximately 500 persons. Few structures are dilapidated and/or vacant; most are maintained in good condition dispite a continued threat of periodic flooding. With continued flooding, residents are disrupted from their normal activities and their residences subjected to periodic inundation and potential substantial damage.

3.54 Business and Industry - Onondaga County, the most populous county of the Syracuse Metropolitan Area, has diversified manufacturing industries which employ highly skilled workers. Most of the factories are located in or near Syracuse and produce such items as electronic equipment, blowers, conveyors, air tubes, pallet loaders, air conditioners, men's clothing, chinaware, decorative wall accessories, floodlights, electrical wiring devices, automotive gears, metal stampings, non-ferrous castings, portable electric power tools, roller bearings, specialty steels, truck and safety lighting equipment, chemicals, and pharmaceuticals. A notable trend, however, in the County economy, is a decline in the manufacturing sector while the service sector is increasing in importance.

3.55 Syracuse is situated at the intersection of valleys running north and south and east and west. The exceptionally fertile soil in the valleys makes Onondaga County outstanding for quality and variety of its farm products. As a result of its strategic location, Syracuse is a hub for transportation and wholesale distribution. The city and county are served by several railroads and airlines, the New York State Thruway, the North-South Expressway and numerous other highways. Water transportation is provided by sections of the Barge Canal. See Reference Figure 1.

3.56 Based upon national and state regional population and economic trends, continued growth in commerce and some shift from the manufacturing sector to the high tech and service sector is anticipated for the Syracuse Metropolitan area. Reference Tables 10 and 11. Related moderate growth and development is expected for the Town of Manlius and vicinity.

3.57 In 1980, an estimated 52 commercial (including the shopping mall), two industrial, and two public structures occupied the Limestone Creek 100-year event flood plain in the Fayetteville vicinity. This includes enterprises such as: merchandise stores; grocery stores; hardware stores; antique shops; a gas station; dental, real estate, advertising offices; repair ships; restaurants; drug stores; liquor stores; a dry cleaner; a car wash; a recreation center; a car dealer; etc. These enterprises provided numerous goods and services to the community and employ an estimated 600 people. With continued flooding, employment and flow of goods and services is periodically disrupted and the potential exists for multi-million dollar flood damages to these establishments.

3.58 Employment and Income - Table 10 depicts employment and income for the New York State, the Syracuse, and the Onondaga County vicinity (1978). In reference, in July 1978 the civilian labor force for Onondaga county consisted of some 214,300 persons, 201,400 of which were employed constituting an employment percentage of 94 perent. The income per capita at the time was $7,546. Comparatively speaking, the employment rate was higher for Onondaga County than for the Syracuse area and/or New York State. Per capita income was slightly higher for Onondaga County than for Syracuse area but slightly lower than New York State.

3.59 Table 11 compares employment by sector for 1970 and 1978 in New York State, the Syracuse area, and Onondaga County. Although the manufacturing sector constitutes the greatest employment sector for the three areas; as

stated in the Business & Industry section, the most notable trend illustrated by the table is the shift in employment from the manufacturing sector to the services sector. This type of transition is expected to continue.

3.60 As stated previously, an estimated 52 commercial (including the shopping mall), and two industrial structures occupy the Limestone Creek 100-year event flood plain in the Fayetteville vicinity. These enterprises provide employment to an estimated 600 people. With continued flooding, both normal employment and associated income could periodically be disrupted.

3.61 Recreational Opportunities - Although land use projections do not indicate a significant demand for additional recreational lands in the County, demand for various recreational activities and associated facilities may change over time. In assessing the recreation potential for Onondaga County, the county found that many kinds of recreational areas and enterprises have a high potential for further development. Of particular interest specific to Limestone Creek is the creek's fisheries and associated fishing potential. Limestone Creek waters are evaluated as being among the top 50 trout streams in New York State. The State's Department of Environmental Conservation (DEC) and Trout Unlimited have fishing rights along 11 miles of Limestone and its West Branch and there are 14 DEC public access areas. The following were included in a county inventory (1968) of streams that have considerable recreational potential.

Name of Water	Location	Size	Present Use
Limestone Creek	Manlius, Pompey Townships. Flows into Butternut Creek	20 miles long; Av. width: 20' Av. depth: 24" Pools to 8'	Good fishing from Manlius to county line. Good access. Stocked with Brown trout. Very little posting. Canoeing.
Biship Brook	Manlius Township. Flows into Limestone Creek.	5.5 miles long; Av. width: 7' Av. depth: 5" Pools to 3'	Some Brown Trout fishing in lower section. Stocking policy stopped because of pollution from Fayetteville.

All streams listed have constant flow. Beds of streams are composed of gravel, ruttle, sand and some silt. All trout waters generally are cool and shaded.

3.62 Despite the extensive development in the project area flood plain, the creek maintains significant fishery (trout) resources value. This induces substantial fishing activities all along the creek. Reference the Natural Environment section, this report, and the U.S. Fish and Wildlife Service Coordination Act Report in the EIS Appendix.

3.63 Agriculture - Though agricultural land use and employment has been declining in Onondaga County over the past few decades, agriculture and agricultural products are still significant in terms of being a major income generating activity and in terms of being a convenient and important local source for various food types. In addition, the striking rural-urban nature of the County gives the area its character and diversity. Although some prime farmland mapping units have been identified within the immediate project area (Reference Figure 6), no portion of any county designated agricultural districts have been identified within the immediate project vicinity.

3.64 Public Facilities & Services.

3.65 Sewerage - Except for several incorporated villages, the development of sanitary sewerage facilities in Onondaga County is basically the responsibility of the County Department of Drainage and Sanitation. Major construction programs have been undertaken during the 1970's - in conjunction with water pollution control goals on the Federal level - to upgrade treatment levels in serviced areas as well as to substantially expand capacity to accommodate previously unserviced and newly-developing areas. Considering current and planned capacities, by 1995 Onondaga County will have an approximate net surplus sewerage capacity of 10 mgd. This translates into a capacity to serve approximately 100,000 more people than has been projected for the County by 1995. It is anticipated that between 90 and 95 percent of the total County population will be served by municipal sewerage systems by 1995.

3.66 There are presently two sewage treatment plants discharging municipal sewage effluent into Limestone Creek. The last of the smaller independent facilities was eliminated in the summer of 1979. The Meadowbrook-Limestone Plant, located north of Fayetteville presently receives all sewage from Fayetteville and Manlius and has been achieving secondary treatment standards. The Minoa plant is a secondary treatment plant but has not been meeting secondary standards. Plans for further upgrading of the system are in the process.

3.67 Water - The County has an excellent water supply in terms of both quality and abundance. In the 1960's local business and government leaders supplemented the Skaneateles and Otisco Lakes sources (with respective maximum capacities of 57 mgd and 20 mgd) by undertaking a massive waterline project to tap into Lake Ontario. Efforts have been underway to expand the capacity of this system to 62 mgd to assure necessary reserves to allow for a whole range of potential development opportunities in the foreseeable future.

3.68 Police and Fire Protection - Within the Town of Manlius, the villages of Manlius, Fayetteville, and Minoa maintain their own police departments which also serve respective districts in the township. These services are also supplemented by the County Sheriffs Department and the New York State Police. Similarly, the villages of Manlius, Fayetteville, Minoa, and Kirkvile maintain their own volunteer fire departments which also serve respective districts in the township. Generally, existing services are very good. Further development is generally determined by demand, availability of resources, and ability of the community to meet the demands.

3.69 Property Values and Tax Revenue - Market values for developed properties within the 100-year event flood plain in the Town and Village of Manlius are comparable but generally less than similar developments in other areas of the community. This general depression of values may be attributed to the threat of periodic flooding. Undeveloped land is less valuable in the flood plain (for some types of developmental activities) since recent flood insurance and flood plain management regulations deter development susceptable to floodwater damage.

3.70 Significant community residential, and commercial property tax sources are located in the flood plain. These represent primary tax revenues to the

village and town and the various service districts. Secondary revenues result from revenue sharing from State and Federal income taxes filed by area residents. These sources are negatively affected by periodic flood inundation.

3.71 Noise - Noise levels in the area are those associated with the residential and commercial developments in the vicinity. Several site visitations indicate that the most notable external noises generated in the vicinity are those from vehicular traffic along Route 5. No severe external noise problems were noted or would be anticipated in the project vicinity.

3.72 Aesthetics - The aesthetics of the area are those associated with the residential and commercial developments in the vicinity. Most of the residential and commercial developments in the vicinity appear to be well maintained; despite the threat of periodic flooding. A few, however, still show the ravages of recent flood problems ("81"). The creek apparently has been cleared, snagged, and channelized to some extent since the last flood. Minor riprap protection, and some contouring, grading, seeding, and other restoration efforts were noted during recent (82-83) site visitations. Although restoration measures were noticeable, the view along the creek of the tree lined bank (usually a narrow band) and riffled stream flow is aesthetically pleasing. This could be altered adversely, however, with continued period flooding and any further flood recovery restoration measures.

3.73 Community Cohesion - Population and community development statistics indicate community cohessive characteristics in the community of Fayetteville. A majority of persons also indicated through project correspondence, work shops, and personal discussion that; the rural atmosphere, proximity to Syracuse, and available community opportunities and service make the community a desirable place to live. Most also agreed that some type of flood control project (measures) would be beneficial to the community as a whole. Of some considerable concern, however, are possible cost impacts and environmental impacts particularly to the fishery resources of Limestone Creek.

CULTURAL RESOURCES - EXISTING/FUTURE CONDITIONS

3.74 In May of 1983, a cultural resources survey of proposed flood control project areas on Limestone Creek and in adjacent areas in Fayetteville, New York was conducted. No significant prehistoric or historic artifacts were discovered. Additionally, the literature and records search indicated that no previously reported sites lie in, or near, the immediate project area. In consideration of the results of the survey and the largely distrubed or marshy nature of the project area, no additional detailed cultural resources investigations were recommended. Based on conversations with local residents, the Barge Canal and dam and feeder canal were considered to be of some local historical note. However, the cultural resources investigations did not identify any historic characteristics that would make the structure eligible for inclusion on the National Register of Historic Places.

SECTION 4 - ENVIRONMENTAL EFFECTS

INTRODUCTION

4.01 This section briefly describes the effects of each detailed plan on the previously described affected environment (resources). It describes in more detail the impacts identified in the Comparative Impacts of Alternatives Table included in SECTION 2 - ALTERNATIVES.

NATURAL ENVIRONMENT - ALTERNATIVE PLAN EFFECTS

Topography and Materials.

4.02 Plan - No Action (Without Conditions) - Reference existing and without conditions under Topography and Materials in SECTION 3 - AFFECTED ENVIRONMENT. As in the past, natural resources will continue to play an important role in the growth and development of communities in Onondaga County. The natural attributes of Limestone Creek are an important item in this spectrum. Despite past and continuing pressures for residential, commercial, and industrial developments, with proper consideration for environmental attributes, these resources, should be preserved to some extent in the future. Continued emergency flood damage reduction measure actions may compromise these efforts in the project area, however. Proper implementation and enforcement of flood insurance and flood plain management policies should help to preserve the natural attributes of the creek and riparian areas.

4.03 Plan 1 - Levee/Floodwall Protection - Installation of levees, stone riprap, and floodwalls would change existing topography to some extent within the project site. Even though a small levee presently exists along a portion of the west bank, the new levee would be somewhat higher and wider. Most of the vegetation creekside of the levee would be removed or replaced with flood resistant species and riprap would make the creek bank slope of the levee rougher. Material resources committed to long-term use will consist of earth and riprap material to construct the levees (much of this material will be obtained from existing levees, if found suitable. Additional materials will be hauled into the project site from local borrow areas) and sheet piling and concrete material to construct the floodwalls. Reference Table Text 2 for rough quantity estimates.

Air Quality.

4.04 Plan - No Action (Without Conditions) - Air quality in the study area would continue to be about the same as described in paragraph 3.14 of the AFFECTED ENVIRONMENT section. Since "No Action" implies that no Federal project would be constructed under this alternative, there would be no project

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related heavy construction equipment dust or exhaust emissions that could temporarily contribute to some temporary short-term minor air quality deterioration. Utilization of heavy equipment for existing channel maintenance or for any future emergency operations could temporarily create minor reduction in immediate work area air quality due to fugitive dust and exhaust emissions, however.

4.05 Plan 1 - Levee/Floodwall Protection - Some temporary short-term minor adverse impacts to air quality would likely occur in the immediate construction vicinity, due to some dust and exhaust fumes created by the normal operation of heavy equipment during project construction. Types of construction equipment that might be utilized include: dozers, backhoe, highlift, dragline, and dump trucks. Project maintenance operations of a similar nature but much less extensive might be anticipated in the future. Impacts to ambient air quality would be minor, short-term, and localized pertaining to some minor increase in hydrocarbons and fugitive dust, but would not deteriorate ambient air quality in violation of Federal or State classification standards. Ambient air quality would return to existing conditions immediately after construction operations (memorandum NYSDEC-83). Anticipated long term air quality classification for the project vicinity would be similar to that described in paragraph 3.17 and 3.18 of the AFFECTED ENVIRONMENT section.

Water Quality.

4.06 Plan - No Action (Without Conditions) - Water quality in the study area would probably improve over time as sewage treatment facilities are upgraded, and as public awareness and management of point and non-point source pollution runoffs improved. Some temporary minor adverse impacts to water quality may occur periodically due to existing channel maintenance operations or emergency operations.

4.07 Plan 1 - Levee/Floodwall Protection - Quarry limestone used to riprap bank slopes is essentially inert and would have no significant adverse impact on water chemistry, salinity, odor, color, dissolved gas levels, water nutrient content, creek degradation, and water temperature. There would be some temporary deterioration in water quality during the levee and riprap construction period, because the creek would experience short-term turbidity due to some substrate excavation and placement of stone along the creek bank. No significant temporary polluted material resuspension is anticipated because the substrate within the creek is essentially clean, unpolluted, stone, cobble, and gravel material and because the stone bedding and riprap fill would also be obtained from an unpolluted source. Operation of construction equipment such as bulldozers, dump trucks, highlift, and backhoe along the creek bank, or in the creek, could accidentally discharge some oil, grease, fuel, and smoke particulates into the creek. Since it is anticipated that construction work would be done during the summer low-flow period, when water depth in the creek channel is somewhat less, and because the Contractor will be required to follow the Corps Construction Guide Specifications for Environ-mental Protection (CW-01430 dated July 1978), the aforementioned adverse impacts will be minimized as much as feasibly possible. No significant long-term adverse impact on New York State water quality standards for this creek are anticipated, other than short-term turbidity during construction. A more detailed discussion of fill impacts is contained in the Section 404 evaluation report located in the Environmental Appendix. Reference paragraph 4.18 under Fisheries for impacts to water temperature also.

Benthos.

4.08 Plan - No Action (Without Conditions) - Reference existing and future conditions under Benthos - SECTION 3 - AFFECTED ENVIRONMENT. The creek channel would continue to provide excellent benthic habitat. Continued periodic flooding problems in the village of Fayetteville could result in further emergency or maintenance restoration measures involving creek channel disruption similar to those initiated after the 1981 flood. These actions, in addition to any adverse effects caused by the flooding disruption could adversely affect the existing benthic habitat. However, surviving on-site benthic invertebrates and invertebrates that drifted into the Fayetteville portion of Limestone Creek from upstream would tend to soon repopulate the disturbed aquatic habitat.

4.09 Plan 1 - Levee/Floodwall Protection - Riprap placement would cover over some shoreline benthic habitat and destroy or disrupt bottom dwelling invertebrate organisms associated with such habitat. Resettlement of temporarily suspended silt and sediment created by construction activity could smother some of these organisms in the creek on site, and to some degree downstream of the project zone. Stone riprap placed along creek bank slopes below the ordinary high water line, would provide new habitat for benthic organism reestablishment. On-site benthic invertebrates that survived construction, and invertebrates that drift onto the new habitats from upstream, will likely begin to repopulate the riprap and channelized portions of the creek to some degree shortly after construction is completed.

Vegetation. (Reference the Vegetation Retention and Planting Plan in Environmental Appendix - E).

4.10 Plan - No Action (Without Condition) - Reference existing and future conditions under Vegetation - in SECTION 3 - AFFECTED ENVIRONMENT. In the Fayetteville vicinity, much of the creek is bordered by a narrow band of riparian vegetation, which provides a terrestrial wildlife habitat corridor and stream shade cover for aquatic organisms in the creek. This woody and herbaceous plant growth still remains intact, despite the existing interspersed residential and commercial developments near the creek. Much of this riparian vegetation would probably remain, however, in some areas future expanded developments (i.e., parking lots, small berms, etc.) could further infringe upon this plant growth. Some riparian vegetation might also be removed if flooding continues periodically, and if further emergency or maintenance restoration measures similar to those implemented after the 1981 flood are required. New development or redevelopments in the flood plain areas will need to comply with flood insurance and flood plain management policies now in effect. Deterance to substantial development in the flood plain and floodway may help to preserve a more natural riparian setting.

4.11 Plan 1 - Levee/Floodwall Protection - In the immediate project zone, approximately 11 acres of existing terrestrial vegetation would be initially removed. Most of this vegetation consists of grasses and forbs established along the existing levees (9 Acres), while the remaining vegetation consists of interspersed trees and shrubs as well as grasses and forbs situated along the creek banks (2 Acres) - particularly in the area south of the bridges.

Most of the riparian vegetation will be preserved along the east embankment except in the area of the proposed floodwall. About 1,000 linear feet/.5 acres of woody riparian vegetation would be removed. Due to limited area and strict levee design parameters, most of the riparian vegetation along the west levee alignment south of the bridges must be removed. (Approximately 2,000 linear feet/11.4 acres) no trees or shrubs may be planted directly on or in close proximity to the levee structure in order to maintain a root free zone and structural integrity. Reference EM-1110-2-31. About 400 linear feet/.5 acres of woody riparian vegetation would be removed along the west embankment just north of the bridges. The new levee along the west bank north of the bridges can be setback slightly to accommodate new riparian revegetation measures. The earthern portion of the newly constructed levee would be quickly vegetated with grasses and legumes to prevent erosion by water and soil runoff. Approximately 800 linear feet/.2 acres of willow and dogwood shrubs would be planted in suitable areas between the creek channel and the levee north of the bridges to provide some riparian vegetation and habitat. Some tree and shrub landscape plantings would also occur in available project disturbed areas.

4.11.1 Although some upstream submerged filamentous algae clinging to rocks would be destroyed along the shoreline during installation of stone bedding and riprap, such algae would probably reestablish on the newly placed submerged riprap. Temporary turbidity during construction of the project would cause short-term reduction in photosynthesis activity of the algae.

Wetlands.

4.12 Plan - No Action (Without Conditions) - Presently, all wetlands 12.4 acres in size or over are protected in New York State. Therefore, unless a permit is granted by the New York State Department of Environmental Conservation (NYSDEC) to allow future local development in such wetlands, it is likely that all or most of the large wetland (approximately 110 acres in size) located just north and northwest of the Fayetteville Mall would continue to remain as a wetland well into the future. Also, discharge of dredged or fill material into wetlands adjacent to waters of the United States are regulated by the U. S. Army Corps of Engineers under Section 404 of the Clean Water Act.

4.13 Plan 1 - Levee/Floodwall Protection - Since the proposed levee and riprap/floodwall construction entirely avoids alteration of any portion of a wetland as well as natural drainage to and from a wetland, no significant impact is anticipated on such resources in the proposed project area.

Fisheries.

4.14 Plan - No Action (Without Conditions) - Since No Action implies that no Federal project would be constructed under this alternative, the fishery in Limestone Creek would remain essentially the same, as described in paragraphs 3.31 through 3.36 of the Existing and Future Conditions Section of

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this report. Some clearing, snagging, riprapping, and channelization has already recently occurred on Limestone Creek at the local level and would probably continue to occur on an as-needed basis in the future to clear out sediment, stone, and snag deposits in order to reduce the possibility of flooding. Some disruption of fish habitat would probably continue. Stocking of Salmonids by Onondaga County would likely continue.

4.15 Plan 1 - Levee/Floodwall Protection - Removal of some riparian shade vegetation along the creek bank could have some adverse effect on fishery (trout) habitat of Limestone Creek in the vicinity of the project. Brown trout (Salmo trutta) are reported to have an optimal temperature range of 65-75°F, while rainbow trout (Salmo gairdneri) prefer 70°F (Scott and Crossman, 1973). Temperature readings taken within the project area during the summer of 1982 ranged from a high of 78°F (Station MS-12) just upstream of the project zone, to 68°F (Station MS-14) just below the existing dam. Temperatures taken at Station MS-13 in the vicinity of the Genesee Street bridge and at Station MS-15 near the downstream end of the potential project average about 70°F. These temperatures fall within the optimal temperature range reported for both species of trout.

4.15.1 Removal of much of the existing riparian shade cover along the west bank, particularly south of the bridges and increased exposure to the summer sun would increase light intensity and to some degree water temperature. An increase in water temperature may in turn cause some decline in the dissolved oxygen level during the day in this section of the creek. Trout would be less likely to utilize this more exposed creek area during daylight hours. However, this upstream portion of the creek (south of the bridges) has a swift to moderate flow over a gravel and cobble substrate. A swift flow through the area would limit heat exposure time to the sun and help dissipate heat, while the riffle effect would continue to help oxygenate the water. Change in water temperature and oxygen levels is not anticipated to be significantly adverse.

4.15.2 Placement of instream stone riprap would cover over some existing fish habitat, but would provide new habitat of some value to fish as cover among stone crevices, and also provide a substrate for invertebrate benthic organism attachment. Turbidity caused by construction may distress fish and cause them to move out of the area temporarily until construction is completed. The newly placed riprap however, would provide suitable habitat for fish and other associated aquatic organisms. In addition, several fishery ledge cover structures and boulders will be placed along disturbed reaches of the stream to provide some fish cover and riffle pool areas for fisheries. Some riparian vegetation retention and plantings of willow and dogwood species in appropriate areas between the creek bed and creekside toe of levee will provide some similar shade and cover in the lower portion of the project area.

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Wildlife.

4.16 Plan - No Action (Without Conditions) - Since No Action implies that no Federal project would be constructed with this alternative, wildlife habitat could be expected to remain similar to existing conditions. Riparian vegetation would continue to be utilized by wildlife for food, nesting and cover, and could continue to be utilized by wildlife as a corridor between habitat areas. In some areas, however, vegetation may be removed due to expanded clearing or as a result of future flood emergency actions. Reference Vegetation.

4.17 Plan 1 - Levee/Floodwall Protection - About 11 acres of terrestrial and riparian wildlife habitat would be initially removed for levee, floodwall, and riprap consruction and installation; about 9 acres of which consists of grass/legume shrubs and 2 acres of which consists of tall woody trees. Reference the Vegetation section. Most wildlife would tend to move out of the construction area to nearby habitats until the project is completed. Some small rodents (i.e., moles, voles, mice) may be destroyed during construction. The earthen portion of the newly constructed levee would be revegetated with grasses and legumes soon after construction, to help protect against erosion and to reduce banksoil siltation into the creek. Plantings of grass and legumes, and some landscape trees and shrubs will replace some of the disturbed vegetative habitat. Stone riprap will provide new habitat for some small mammals such as mice. With removal of some tall riparian tree species and conversion to a lower more open habitat containing a planted grass-legume seeding and spot plantings of small trees, it could be expected that there might be some minor change in the wildlife composition to species that inhabit a more open type ecosystem.

4.17.1 The Fayetteville Bird Sanctuary is located about 500 feet or more upstream of the upper limit of the proposed project, therefore, no significant impact on the sanctuary is anticipated.

Protected Species.

4.18 Plan - No Action (Without Conditions) - Occasional transient protected species may briefly occur within the project area, since the site is within their general brood habitat range. Reference paragraph 3.39.

4.19 Plan 1 - Levee/Floodwall Protection - USF&WS in a letter dated 16 February 1984 indicated that no Federally listed or proposed threatened or endangered species are known to exist in the project area except for an occasional transient species. Therefore, no impact to threatened or endangered species or critical habitat necessary for their survival is anticipated.

HUMAN ENVIRONMENT - ALTERNATIVE PLAN EFFECTS

Flooding and Man-Made Resources.

4.20 Plan - No Action (Without Conditions) - Reference existing and without conditions under Flooding and Man-Made Resources in SECTION 3 - AFFECTED ENVIRONMENT. Approximately 120 residential, 20 multifamily, 52 commercial (including the Mall), 2 industrial establishments, and 2 public buildings would be affected by a 100-year flood event. With this alternative, continued flooding of existing developments would be anticipated. It has been calculated that under existing conditions, the village would suffer

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an average of $688,000 per year in damage from flooding for the project life. Damages to additional future flood plain developments should be minimized by flood insurance and flood plain management policies now in effect.

4.21 Plan 1 - Levee/Floodwall Protection - This alternative plan would provide 100-year event flood level protection to approximately 130 acres of existing community flood plain developments. This would include protection for most of the 120 residential, 20 multifamily, 52 commercial (including the Mall), 2 industrial, and 2 public buildings. The existing levees would be rebuilt, extended, and modified to Federal standards and a floodwall constructed. As indicated in the plan description paragraph 2.19f and paragraph 4.28, four residences consisting of two houses and one trailer, located immediately adjacent to the feeder canal, and a house along the northeast embankment would need to be aquired and/or relocated. The town-owned structure housing a county family service center would be protected. Although two bridges and the canal dam in the project area may require some additional riprap protection, they would not be affected significantly. The 100-year flood plain would be redesignated for the area and the protected community developments would no longer be in a designated 100-year flood plain. The proposed project is designed that communities above and below Fayetteville will not suffer additional flooding problems due to the project. This is a standard hydrological hydraulic design constraint consideration. Increases in water surface elevation due to the project will occur only between the upstream end of the proposed levee and a point 700 feet downstream of the existing dam. Potential damages to future additional flood plain developments should be minimized through flood insurance and flood plain management policies now in effect.

Community and Regional Growth and Development.

4.22 Plan - No Action (Without Conditions) - Reference existing without conditions under Community and Regional Growth and Development in the AFFECTED ENVIRONMENT. Although some minor remedial actions may be taken periodically by the State and community (similar to those after the 81 flood), if no significant flood damage reduction measures can be implemented through this study, the potential for significant community damages and disruption associated with flooding would continue. This would not adequately address the community and regionally expressed desires to provide sufficient flood damage reduction measures to existing floodprone community developments important in maintaining and promoting continued growth and development. Additionally, community and regional resources would continue periodically to be expended in responding to flood emergency situations and recovery, thereby temporarily precluding use of some of these resources on other community needs.

4.23 With continued flooding, many developments might be maintained but rarely improved. Some residents may relocate from the flood plain, if possible. Any new development or redevelopment would need to comply with flood insurance and flood plain management policies, now in effect. In the long term, this may help to preserve a more natural riparian setting.

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4.24 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to existing community developments along the main branch of the creek in the project area. Protected developments would be expected to remain and be improved preserving existing land use and structural development resources. Costly disruptions to normal community activities and flood related health and safety hazards would be reduced substantially. Many of the community and regional resources presently expended in addressing flood emergency situations could be better utilized elsewhere. This would contribute to desirable community and regional growth and development.

4.25 A significant resource important to environmental and recreational developments in the vicinity is the cold water (trout) fishery of Limestone Creek. In the project area, quality habitat for this fishery presently exists from the upstream project limit and extends just downstream of the Route 5 bridge. Although levee construction, installation of stone bedding and riprap, and clearing and snagging in this area will alter the shoreline fishery habitat along the west bank of the creek somewhat; no significant long-term adverse impact to the fishery resource or associated potential community or regional growth opportunities would be expected. Reference the subsections pertaining to fisheries and recreational opportunities in this SECTION 4. New or redevelopment in the remaining flood plain areas will need to comply with flood insurance and flood plain management policies now in effect. Deterance to structural development in the flood plain and floodway may help to preserve a more natural riparian setting.

4.26 Note: The following sections discuss in more detail anticipated impacts of alternative plans to parameters relative to community and regional growth and development.

Population (Displacement of People).

4.27 Plan - No Action (Without Conditions) - Reference existing and without conditions under Population in SECTION 3 - AFFECTED ENVIRONMENT. Moderate population growth is anticipated for the Town of Manlius while lesser growth is anticipated for the Village of Fayetteville. Reference Table 5. If flooding is persistent, some residents may choose to relocate from the flood plain, if possible. Others, in existing residences, would continue to suffer the periodic impacts of flooding and recovery. Potential impacts to residents of any future flood plain developments or redevelopments should be lessened by flood insurance and flood plain management policies now in effect.

4.28 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to most existing residences and other developments along the main branch of Limestone Creek in the floodprone project area. Four residences consisting of two houses and one trailer located immediately adjacent to the feeder canal, and a house along the northeast embankment would need to be acquired and/or relocated. The residents of the three houses would probably be relocated to alternate residences. The houses would then probably be razed and the basements and/or foundation filled, graded, and seeded. The trailer and residents would probably be relocated to a new site.

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The town-owned structure housing a county family service center would be protected by the plan. Because of their position within the flood plain, structural protection methods are not feasible. Relocation could probably easily be accomplished within the community. Acquisition and/or relocation would be accomplished in accordance with guidelines established by the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970." Protected existing residences and developments would be expected to remain in the long term. With the extent of existing developments in the immediate project area, only limited additional development would be expected. Protected residences and developments provide homes for approximately 500 persons, and employment for approximately 600 persons in addition to providing many community goods and services. Potential flood damages to any future flood plain developments should be minimized by flood insurance and flood plain management policies now in effect.

4.29 A small workforce of approximately a dozen construction personnel would be employed for project work for approximately one or two construction seasons. Depending on the selected construction contractor, these personnel could commute to the worksite from the surrounding community(ies) daily or reside weekly or seasonally in the project area community during the construction period. This should not present a significant problem for community resources or services.

Land Use and Developments.

4.30 Plan - No Action (Without Conditions) - Reference existing and without conditions under Land Use and Developents in SECTION 3 - AFFECTED ENVIRONMENT. In the Town of Manlius, moderate growth in residential and commercial and slight growth in transportation and industrial land use is expected. Recreational land use should remain relatively stable, while agricultural and open land use are expected to decline relative to development activities. In the immediate Fayetteville project vicinity, the flood hazard area is almost completely developed. As noticeable on Reference Figures 3 and 5C approximately 1/2 of the 130-acre project area flood plain is developed residentially, 1/4 is developed commercially, and 1/4 is undeveloped. There are an estimated 120 residential, 20 multifamily, 52 commercial (including the shopping mall), 2 industrial, and 2 public structures which occupy the Limestone Creek 100-year event flood plain. If no significant flood damage reduction measure can be implemented, these developments would continue to periodically sustain flood damage and disruptions associated with flooding. Many developments might be maintained but rarely improved. Any new or redevelopment would need to comply with flood insurance and flood plain management policies now in effect. In the long term, this may help to preserve a more natural riparian setting.

4.31 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to the existing community flood plain developments along the creek in the project vicinity. Approximately 11 acres of land area paralleling the creek would be required for levee and floodwall construction. Reference Figure Text 1. Most of this area is utilized as existing levee (State owned). Protected existing developments would be expected to remain and improve in the long term maintaining

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similar to existing land use. With the extent of existing development in the immediate project vicinity, only limited additional development would be expected. The protected area would no longer be designated as being located in the 100-year flood plain. Any new or redevelopment in the remaining flood plain areas would need to comply with flood insurance and flood plain management policies now in effect.

Residential (Housing).

4.32 Plan - No Action (Without Conditions) - Reference existing and without conditions under Residential in SECTION 3 - AFFECTED ENVIRONMENT. In the Fayetteville project vicinity, there are about 120 residential and 20 multifamily residential units within the 100-year event flood outline which provide homes for approximately 500 residents. If no significant flood damage reduction measures can be implemented, these residences would have good potential to periodically sustain damages and the residents disruptions associated with flooding. With periodic flooding, although many homes are still well maintained, few would be improved. Although some housing values may remain comparable to similar housing in non-floodprone areas, due primarily to a convenient location within the community, most are depressed slightly due to the threat of potential flooding. Any new residential or redevelopment would need to comply with flood insurance and flood plain management policies now in effect.

4.33 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to most of the existing 120 residential and 20 multifamily flood plain developments along the creek in the project vicinity. As indicated in the plan description paragraph 2.19f and paragraph 4.28; four residences, consisting of two houses and one trailer located immediately adjacent to the feeder canal and one house on the northeast embankment would need to be acquired and/or relocated. Reference those paragraphs. Protected residences would be expected to remain and to be improved in the long term. With the extent of existing development in the vicinity, only limited additional development would be expected. The protected area would no longer be designated as being located in the 100-year flood plain. With this and some improvements, property values may increase slightly but the need for any extensive flood insurance would decrease significantly. Any new residential or redevelopment in the remaining floodprone area would need to comply with flood insurance and flood plain management policies now in effect.

Business and Industry.

4.34 Plan - No Action (Without Conditions) - Reference the existing and without conditions under Business and Industry in SECTION 3 - AFFECTED ENVIRONMENT. In 1980, an estimated 52 commercial (including the shopping mall), 2 industrial, and 2 public structures occupied the Limestone Creek 100-year event flood plain in the Fayetteville vicinity. These include a wide spectrum of business types which provide numerous goods and services to the community and employ an estimated 500 people. If no significant flood damage reduction measure can be implemented, employment and flow of goods and services is periodically disrupted and the potential exists for multi million dollar flood damages to these establishments. These entities would probably

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have a better potential to provide some private flood damage reduction measures, but, the degree and or reliability of protection would probably not be substantial and associated flooding disruptions would still be expected. Any new or redevelopment would need to comply with flood insurance and flood plain managemnet policies now in effect.

4.35 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to the 52 commercial (including the mall), 2 industrial, and 2 public buildings situated within the floodprone project area. Protected businesses would be relieved of damages and disruptions associated with flooding (up to the 100-year event level) and would be expected to remain in the area and make some improvements. With the extent of existing development in the vicinity, only limited additional development would be expected. The protected area would no longer be designated as being located in the 100-year flood plain. With this and some improvements, property values may increase sightly but the need for any extensive flood insurance would decrease significantly. Any new business or redevelopment in the remaining floodprone area, would need to comply with flood insurance and flood plain management policies now in effect.

4.36 Construction of the project would provide business opportunities, probably to local contractors, with levee/floodwall/construction capabilities. The project could probably be constructed in one or two seasons. Minor secondary benefits to housing, restaurants, retail stores, etc., would also be realized due to the workforce needs during this construction period.

Employment and Income.

4.37 Plan - No Action (Without Conditions) - Reference the existing and without conditions under Employment and Income in SECTION 3 - AFFECTED ENVIRONMENT. Comparatively speaking, the employment rate is generally higher for Onondaga County than for the Syracuse area and New York State. Per capita income is higher for Onondaga County than for the Syracuse area but slightly lower than New York State (1978). A most noticeable trend is the shift in employment from the heavy manufacturing sector to the high tech and service sectors. These type relationships are expected to continue for some time.

4.38 As stated previously, an estimated 52 commercial (including the shopping mall), and two industrial structures occupy the Limestone Creek 100-year event flood plain in the Fayetteville vicinity. These enterprises provide employment to an estimated 500 people. With continued flooding, both normal employment and associated income could periodically be disrupted. Significant production, business, and employment disruptions could occur for days or weeks at a time. Although these business entities would probably have a better potential to provide private flood damage reduction measures; the degree and/or reliability of protection would probably not be substantial and associated flooding disruptions would still be expected (i.e., transportation, entry, etc).

4.39 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to the 52 commercial (including the mall), 2 industrial, and 2 public buildings situated within

the floodprone project area. Protected business would be relieved of periodic damages. Production, service, and employment disruptions associated with flooding (up to the 100-year event flood level) would also be relieved saving substantial employment, time, and income.

4.40 Construction of the project would provide employment for a small workforce in the levee/floodwall construction business. The project could probably be constructed in one or two seasons. Minor secondary benefits to employment and income may result for housing, restaurant, retail businesses, etc., due to workforce needs during this period.

Recreational Opportunities.

4.41 Plan - No Action (Without Conditions) - Reference the existing and without conditions under Recreational Opportunities in Section 3 - AFFECTED ENVIRONMENT. Of particular interest specific to Limestone Creek, is the creeks fisheries and associated fishing potential. Limestone creek waters are evaluated as being among the top 50 trout streams in New York State. NYSDEC and Trout Unlimited have fishing access rights along portions of the creek, but the demand for variety and convenient fishing access continues. A county inventory of streams with considerable recreational fishing potential includes the main branch of Limestone Creek from its upper reaches to the Route 5 bridge in the project area, and Bishop Brook which flows into the main branch near the project vicinity.

4.42 Despite the extensive development in the project vicinity (and associated impacts from development), the creek maintains significant fishery (primarily trout) resources. This induces substantial fishing activities all along the creek. If no significant flood damage reduction measures can be implemented, potential continued periodic flooding would be expected. Some maintenance channelization and clearing and snagging measures similar to those utilized after the 1981 flood might periodically be implemented in the Village of Fayetteville vicinity. This could diminish the fishery habitat and associated recreational fishing potential in the project vicinity. Overall, however, good fishery potential could be expected to survive. Flood plain management policies restricting extensive development or redevelopment in the immediate creek vicinity could in the long term help in benefiting riparian and fishery habitat, and in turn also benefit associated fishing potential.

4.43 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to developments along the creek in the floodprone project area. Protected existing developments would be expected to remain in the long term, preserving similar to existing land use. Stream access would primarily remain the same or be improved slightly with levee construction and associated access. The canal dam and confluence of Bishop Brook would not be significantly affected.

4.44 Set back levee/floodwall, riprap construction and clearing and snagging measures, particularly in the upstream project area at and south of the Route 5 bridge, could adversely affect the fisheries habitat along the west creek bank to some degree. Temporary disruption of recreational creek fishing may

occur in the vicinity during construction. Recreational fishing in the creek would still be possible, even though the quality of shade cover formerly provided by trees and shrubs on the west bank would be diminished. Additionally, there will be some pedestrian access to the creek where bank easements are provided for future project maintenance and potential local park developments.

Agriculture (Prime Soils, Displacement of Farms).

4.45 Plan - No Action (Without Conditions) - Reference existing and without conditions under Agriculture in SECTION 3 - AFFECTED ENVIRONMENT. Agriculture and agricultural products will continue to be significant in Onondaga County as a major income generating activity and as a convenient and important local source of various food types. No portion of any county designated agricultural district has been identified within the immediate project vicinity, although a number of county designated prime farmland mapping unit soils have been identified in the Fayetteville locale indicating agricultural potential. Reference Figure 6. These, however, have already been significantly disturbed by existing community developments.

4.46 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level protection to the community developments situated within the floodprone project area. Protected existing developments would be expected to remain in the long term preserving similar to existing land use. The only prime farmland soil noted in the proposed project area is some teel silt loam, located near the southern end of the project site. Field observation of these soils indicated that this soil type appears to have been previously significantly disturbed by previous construction of the existing levee. Since part of the new proposed levee would be constructed at the same levee site, no significant impact on this prime farmland soil type is anticipated.

Public Facilities and Services.

4.47 Plan - No Action (Without Conditions) - Reference existing and without conditions under Public Facilities and Services in SECTION 3 - AFFECTED ENVIRONMENT. Adequacy of public facilities and services such as water, sewage, utilities, and police and fire protection are generally determined by demand, availablility of resources, and the ability of the community to meet those demands. Basic public facilities and services in the Fayetteville vicinity appear to be sufficiently adequate and are anticipated to be so for the future.

4.48 If no significant flood damage reduction measures can be implemented, potential continued periodic flooding of existing community developments would be anticipated. This in turn would require continued expenditure of community resources to service facilities and to service the public needs in addressing the flood emergency situations.

4.49 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to the existing community developments situated within the floodprone project area. Flood damage reduction measures would significantly reduce hazards associated with

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flooding and make the existing developments in the existing flood plain a safer place in which to live. Less demand on emergency type services would be required during potential flood periods. Protected existing development would be expected to remain in the long term and already establsihed facilities and services could continue to be utilized. Periodic maintenance of the flood damage reduction measures, however, would probably be assumed by the community.

4.50 Although 100-year event level flood protection is a significant level of protection; floods of greater magnitude could occur. Flood damage reduction measures may instill a somewhat false sense of security in residents for this situation and they should be kept well informed of the limitation of the flood damage reduction measures.

Property Values and Tax Revenues.

4.51 Plan - No Action (Without Conditions) - Reference existing and without conditions under Property Values and Tax Revenues in SECTION 3 - AFFECTED ENVIRONMENT. Developed flood plain properties are comparable but of somewhat lesser value than similar developments in other areas of the community. Still, these represent significant existing tax revenue to the community. These relationships would be expected to continue for the near future. Tax revenues would continue to be utilized to address the continued flooding problems.

4.52 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to existing community developments situated within the floodprone project area. With 100-year event level of flood protection the protected area would be rezoned from the 100-year flood plain hazard area. Properties may be improved, and developed property values would be expected to increase slightly. Non-developed property values may increase even slightly higher because of new developmental potential, but since the protected area is already fairly well developed, any further development would be limited. The need for extensive flood insurance would be substantially reduced. Associated community revenues from protected property values and commercial activities would be maintained or increased slightly, although a share of community revenue would undoubtedly contribute to the local share for project construction and maintenance.

Noise.

4.53 Plan - No Action (Without Conditions) - Reference existing and without conditions under Noise in SECTION 3 - AFFECTED ENVIRONMENT. No severe external noise problems were noted or would be anticipated in the project vicinity.

4.54 Plan 1 - Levee/Floodwall Protection - Noise associated with clearing, excavation, trucking, and construction would be noticeable in the construction and trucking areas of the project vicinity. This could be somewhat annoying to persons in residences and businesses in the immediate project area, but is considered to be a minor short-term impact. Truck routings should be planned to avoid substantial movement through residential areas

where possible. It is anticipated that project construction would be complete in one or two construction seasons. Noise levels should return to normal after construction.

Aesthetics.

4.55 Plan - No Action (Without Conditions) - Reference existing and without conditions under Aesthetics in SECTION 3 - AFFECTED ENVIRONMENT. The aesthetics of the area is that associated with the residential and commercial developments in the vicinity, most of which are well maintained. The creek apparently has been cleared and snagged, channelized, and leveed to some extent since the last flood (81). Although restoration measures are noticeable, the view along the creek of the tree-lined bank (narrow band), the dam, and riffled stream flow is aesthetically pleasing. This restored aesthetic condition, however, would be expected to be disturbed periodically to post-flood conditions should significant flooding recur. Restoration measures again may need to be implemented thereby altering existing aesthetics.

4.56 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to the existing community developments situated in the floodprone project area. This would essentially eliminate the periodic flooding to the community developed area and the mess aftermath associated with flooding. It would also encourage developmental improvements, and improved maintenance, all of which, would improve the overall aesthetics of the vicinity.

4.57 Implementation of the proposed measures would unavoidably temporarily disrupt the aesthetics along the creek due to the construction and movement of construction equipment in the area. Clearing and snagging in the upstream reach south of the Route 5 bridge would alter the existing natural look of the stream and streambank in this area. The larger modified and extended levees and floodwalls, built to Federal specifications, would restrict the view to and from the immediate creek and protected development perimeter areas. Most of these latter impacts, however, could be successfully mitigated through appropriate landscaping and planting techniques.

Community Cohesion.

4.58 Plan - No Action (Without Conditions) - Reference existing and without conditions under Community Cohesion in SECTION 3 - AFFECTED ENVIRONMENT. Although some minor remedial measures may be implemented by the community, if no substantial flood damage reduction measures can be implemented, the existing community developments will continue to sustain periodic flood damages and disruptions associatd with flooding. This disruption to existing community developments and normal activities is in turn disruptive to normal community cohesion. With continued flooding, many existing developments might be maintained, but rarely improved. Some residents may relocate from the flood plain, if possible.

4.59 Resident/tenants of the exising developments in the flood prone area have suffered from periodic flooding for quite some time and desire some form of action from their community and elected officials in addressing their

problems. A determination of No Action would further frustrate flood damage victims and government officials seeking a solution to the flooding problems.

4.60 On the other hand, although most community entities agree that something should be done to address the community flooding problem; a unanimous solution is not easily determined. Concerns of interests for flood protection, equitable cost and responsibility allocation, and the environment continue; and some conflict in interests persist.

4.61 Plan 1 - Levee/Floodwall Protection - Flood damage reduction measures would provide 100-year event level flood protection to existing community developments situated within the floodprone project area. Protected existing developments would be expected to remain in the long term. Some structural improvements and improved maintenance would be expected. Fewer resident relocations would also be expected. All this would contribute to better community cohesion.

4.62 Environmental and fishing interests are concerned about potential adverse impacts of levee/floodwall construction, and clearing and snagging measures particularly to sport fisheries in the area. Although some adverse impacts would unavoidably occur during construction, with implementation of environmental design measures, no long-term significant adverse impacts need occur. However, some concerns persist.

4.63 A share of the initial project construction cost and maintenance costs will be allocated to the local sponsor and in turn to the local community. These are subject to further community review and evaluation.

CULTURAL RESOURCES - ALTERNATIVE PLAN EFFECTS

4.64 Based on the findings of cultural resources investigations and review of various cultural resource agencies; no significant adverse impacts to cultural resources would be expected with implementation of any of the alternative plans finally considered. Reference SECTION 6 - PUBLIC INVOLVEMENT AND COORDINATION - REQUIRED COORDINATION paragraph 6.07.

LIMESTONE CREEK - FAYETTEVILLE, NY

SECTION 5 - LIST OF PREPARERS

5.01 The following people are primarily responsible for preparing this Environmental Statement:

Section and Name	Expertise	Experience	Professional Discipline
Plan Formulation:			
Joseph Raimond (Project Manager)	Civil Engineering and Planning	4 years Plan Formulation Branch Project Manager; US Army Engineer District, Buffalo	Civil Engineer
Environmental Branch			
Tod Smith (EIS Coordinator)	Environmental Planning	13 years EIS studies and Engineering Drafting Technician; U.S. Army Engineer District, Buffalo.	Community Planner
Leonard Bryniarski	Natural Resources (Aquatic and Biology)	17 years, EIS studies; U.S. Army Engineer District Buffalo. 13 years U.S. Soil Conservation Service.	Ecologist
Timothy Daly	Cultural Resources	13 years, EIS studies; U.S. Army Engineer District, Buffalo.	Social Scientist
Economic Section:			
Roger Haberly	Economics	10 years, Economic Analysis; U.S. Army Engineer District, Buffalo.	Economist

LIMESTONE CREEK - FAYETTEVILLE, NY

SECTION 6 - PUBLIC INVOLVEMENT

INTRODUCTION

6.01 This section briefly describes the study's Public Involvement Program, Required Coordination, Statement Recipients, and Public Views and Responses.

PUBLIC INVOLVEMENT PROGRAM

6.02 Study activities have been coordinated with appropriate governmental agencies and the general public. The U.S. Army Corps of Engineers public involvement program incorporates a series of project public meetings and/or workshops, general and formal coordination procedures, and formal draft and final report review procedures. Public participation and correspondence is encouraged throughout the study. Pertinent correspondence is included in the Correspondence and Comment/Response Appendices.

6.03 As evident by Table Text 4, public involvement coordination relative to this study, but pertaining to flooding problems in the town of Manlius (including both the village of Manlius and the village of Fayetteville vicinities) was formally initiated in November 1979. Subsequently, these village flooding problems are being addressed under separate studies. More specifically, for the village of Fayetteville Study, an investigation to determine the applicability of Section 205 was initiated in response to a letter dated 23 October 1980 from James H. Lannon, Mayor, Village of Fayetteville, NY. The letter requested that the Corps of Engineers conduct a study of areas within the village that are periodically subject to flooding from Limestone Creek. The Reconnaissance Report was prepared in May 1981 and approved in June 1981. Subsequently, the detailed planning investigation and preparation of the Detailed Project Report was initiated in August of 1982. For this investigation, in addition to the formal Federal, State, and Local Coordination, a number of public and agency field trips, workshops, and meetings were/are conducted. Pertinent formal workshops and meetings for this investigation are listed on Table Text 4.

Table Text 4 - Public Involvement Workshops/Meetings

	Date	Primary Purpose	Location
8	Nov 79	Public workshop primarily to initiate public involvement, summarize study authority, identify water resources problems and needs, and to formulate some planning objectives.	Village of Manlius

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Table Text 4 - Public Involvement Workshops/Meetings (Cont'd)

Date	Primary Purpose	Location
12 Feb 82	Meeting (made public) with town, village (both Manlius and Fayetteville), and State officials to discuss aspects of alternative study authorities and feasibility and effectiveness of various alternative measures. Decision to initiate two Section 205 studies.	Village of Fayetteville
22 Apr 82	Stage II - Public Meeting/Hearing to review the study process and progress, to present a preliminary assessment of the most feasible alternative measures, and to summarize Stage II findings and recommendations.	Village of Manlius
29-30 Sep 82	Field trip of Corps project personnel to view the project site, discuss preliminary possible solutions, meet with key identified local public, and gather basic local information.	Village of Fayetteville and Town of Manlius
26-27 May 83	Field trip of Corps project personnel to discuss study progress and schedule with local officials; and to participate in a coordinated local public interview and survey to identify and discuss with local residents: flooding problems, additudes, desirable measures, the planning process, considerations, constraints, possible alternative measures and possible impacts.	Village of Fayetteville and Town of Manlius
Jan 84	News Letter - forwarded primarily to local agencies and resident study participants informing them of study progress and schedule.	Village of Fayetteville and Town of Manlius
Aug-Sep 84	Coordination of Draft DPR and EIS.	45-day agency and public review.
Sept 84 ...	Address comments and coordinate for finalization of Final DPR and EIS.	

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REQUIRED COORDINATION

6.04 Throughout the study and planning process, close coordination has been maintained with the town of Manlius, the village of Fayetteville, and the New York State Department of Environmental Conservation (NYSDEC). In New York State, for Corps investigations conducted under the Section 205 study authority, NYSDEC is designated as the local cooperator and generally coordinate with the Corps and the locals to attain necessary local assurances. Local and State representatives were aware of and/or present at all of the pertinent coordination meetings and workshops and contributed significiantly to the plan formulation and cooperation process both from the flood protection and fish and wildlife preservation aspects.

6.05 In compliance with Section 404(b)(1) of the Clean Water Act, a public notice and Section 404(b)(1) evaluation report was coordinated for review in conjunction with review of the Draft DPR and Draft EIS. These are included in the Environmental Appendix. With respect to the State's Section 401 Water Quality Certification. The New York State Department of Environment Conservation, in a letter dated 6 August 1979 (on file at the Buffalo District Office), stated that: "The formality of a Departmental review and process of an application is considered to be moot by virtue of DEC's participation. Henceforth, we are waiving Water Quality Certification on these projects where DEC is the local cooperator."

6.06 Close coordination has also been maintained with the U.S. Department of the Interior, Fish and Wildlife Service (F&WS). This included a number of joint agency field investigations, coordination meetings, correspondence, telephone discussions, and a formal plan review process. A field trip was conducted to the Limestone Creek watershed vicinity by both Corps and F&WS representatives in November of 1979. A 29 February 1980 planning aid letter was submitted to the Corps by the USF&WS. which generally described the fish and wildlife resources of the watershed. With evident significance of fishery resources in the watershed, a joint agency (COE and F&WS) detailed field study of both the Manlius and Fayetteville vicinities was conducted. This study report was provided to the Corps by F&WS in January of 1983 and substantiated significant fisheries in the creek. In June of 1983, potential alternative measures for the Fayetteville vicinity were sent to F&WS for their review of which they provided a second 25 July 1983 planning aid letter which assessed the potential impacts of proposed alternatives to fish and wildlife resources and provided recommendations. A scope of work to prepare the Fish and Wildlife Coordination Act Report FWCA report was coordinated with the U.S. Fish and Wildlife Service in October 1983. Revised project plans were forwarded to the U.S. Fish and Wildlife Service for utilization in preparation of their Draft FWCA report in January of 1984. The Draft FWCA report was received in March of 1984. The Final FWCA report was received in June of 1984. This report includes a summary of fish and wildlife resources in the project vicinity, anticipated project impacts, and the U.S. Fish and Wildlife Service project recommendations. These are addressed in the Detailed Project Report. This report was also coordinated with the New York State Department of Environmental Conservation. A copy of this report is included in the Environmental Appendix.

6.07 In order to comply with legislation pertaining to cultural resources, coordination for this project was initiated and maintained with the Director-Advisory Council on Historic Preservation, the National Parks Service, the New York State Office of Parks and Recreation (State Historic Preservation Officer - SHPO) and the New York State Archaeologist. These offices are asked to review study cultural resource investigation findings and to make comments and recommendations. In order to assess impacts of the project on cultural resources, a Cultural Resources Reconnaissance Level Survey was conducted for the Fayetteville project vicinity in May of 1983. No significant prehistoric or historic artifacts were discovered.

Additionally, the literature and records search indicated that no previously reported sites lie in, or near, the immediate project area. In consideration of the results of the survey and the largely distrubed or marshly nature of the project area, no additional detailed cultural resources investigations were recommended. This report was completed and coordinated with pertinent cultural resources agencies for review and comment in August of 1983. No contrary comments were received. Revised plans were also coordinated with the State Historic Preservation Officer in February of 1984. Based on these evaluations, no significant adverse impacts to cultural resources is expected with implementation of the preferred plan. Pertient correspondence relative to cultural resource aspects are included in the Environmental Appendix.

6.08 In addition to the previously mentioned required coordination, Corps investigations must comply with a multitude of other pertinent Federal and State environmental laws/legislation and Executive Orders. This is generally accomplished via the Corps planning process; special investigation, review, and coordination; and coordination of the pertinent environmental statements. The present relationship of plans to environmental protection statues and other environmental requirements is briefly summarized in Table Text A.

STATEMENT RECIPIENTS

6.09 The following agencies, interest groups, and individuals will receive copies of the pertinent environmental statements for information, review, and/or comment.

Congressional

U.S. Senator - Alphonse D'Amato
U.S. Senator - Daniel P. Moynihan
U.S. Representative - George Wortley

Federal

Advisory Council on Historic Preservation
Department of Agriculture
Forest Service
Soil Conservation Service
Department of Commerce
Department of Defense
Department of Energy
Environmental Protection Agency
Federal Emergency Management Administration
Department of Health and Human Services
Department of Housing and Urban Development
Department of the Interior
Department of Transportation

State

Office of the Governor
New York State Clearinghouse
New York State Department of Agriculture and Markets
New York State Department of Commerce
New York State Department of Environmental Conservation
New York State Department of Health
New York State Department of Transportation
New York State Historic Preservation
New York State Office of Parks and Recreation
New York State Office of Planning Services
Office of the State Archeologist

Regional and Local

Central New-York-Regional Planning and Development Board (A-95)
Onondaga County (Agencies)
Town of Manlius
Village of Manlius
Village of Fayetteville
Trout Unlimited
Other Regional Environmental Groups

Other Organizations and Individuals.

Individuals are not listed. A complete mailing list is on file at the U.S. Army Corps of Engineers, Buffalo District Office.

6.10 Generally, based on preliminary coordination, the New York State Department of Environmental Conservation and the Village of Fayetteville (and residents) support the proposed flood damage reduction measures for the vicinity provided appropriate social, economic, and environmental considerations are incorporated. Identified concerns were considered in the plan formulation process. Final determination and review of local cost allocations is pending.

6.11 The U.S. Fish and Wildlife Service was coordinated with during the plan formulation process. They have provided substantial information, review, comment, and recommendations pertaining to existing fish and wildlife resources and potential impacts of alternative plan measures. Their recommendations, particularly pertaining to adverse impacts of channelization and removal of riparian vegetation to fisheries habitat, have been considered in the plan formulation process and will be incorporated to the extent possible. Generally, they will support the project provided appropriate environmental measures are incorporated. Reference the U.S. Fish and Wildlife Service Coordination Act Report included in the Environmental Appendix for further detail.

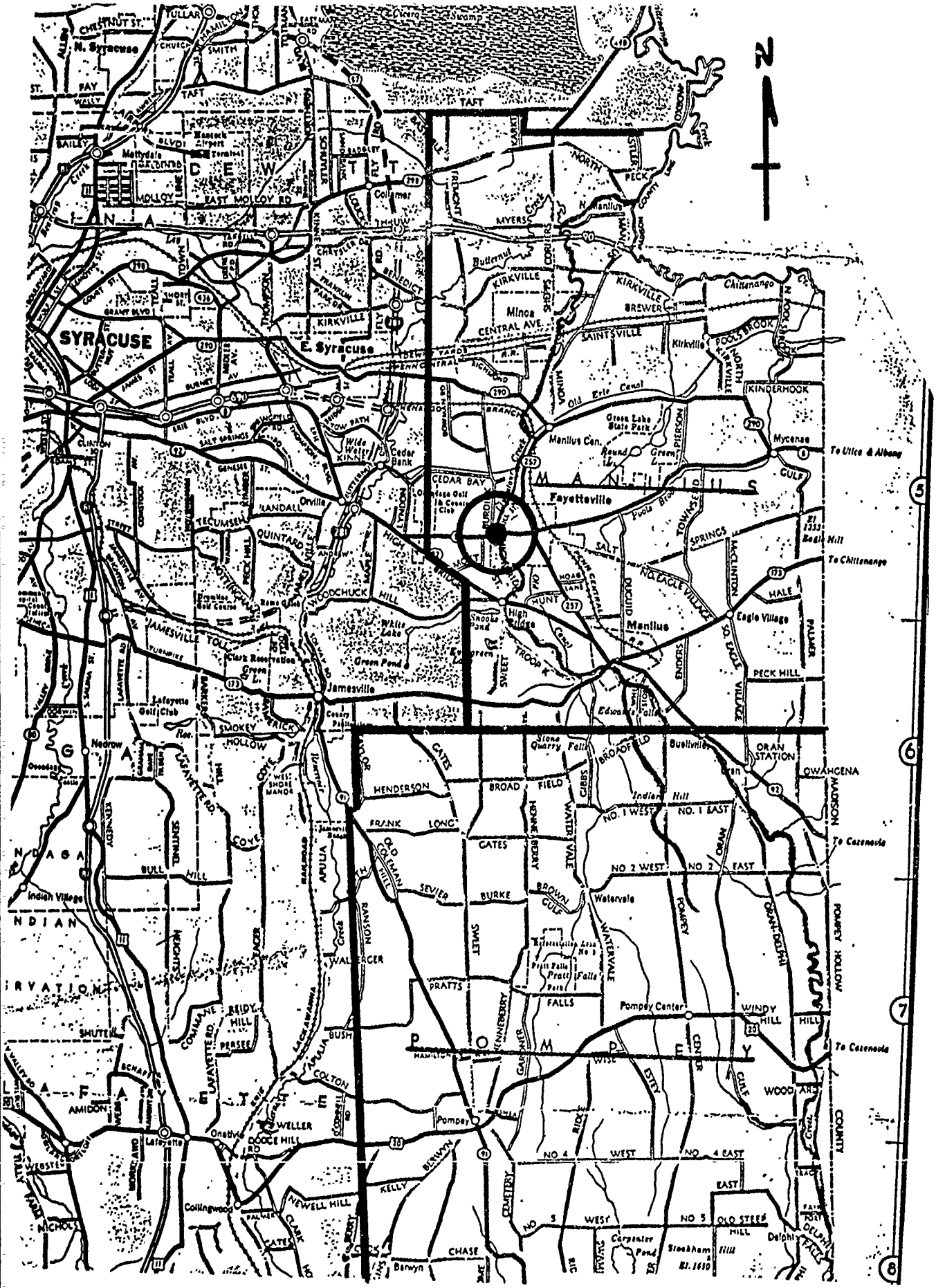
6.12 The New York State Historic Preservation Office, having reviewed the cultural resources reconnaissance survey report, and the proposed alternative plan has stated that the N.Y.S.H.P.O. is in agreement with the conclusions of the July 1983 Cultural Resources Survey for Limestone Creek, Fayetteville, NY, and that no further cultural resources investigations are recommended. No significant adverse impacts to cultural resources would be expected with impementation of the proposed alternative.

6.13 Agency and public comments on the Draft Detailed Project Report and Draft Environmental Impact Statement and associated Corps responses are included in the Comment/Response Appendix of this final report.

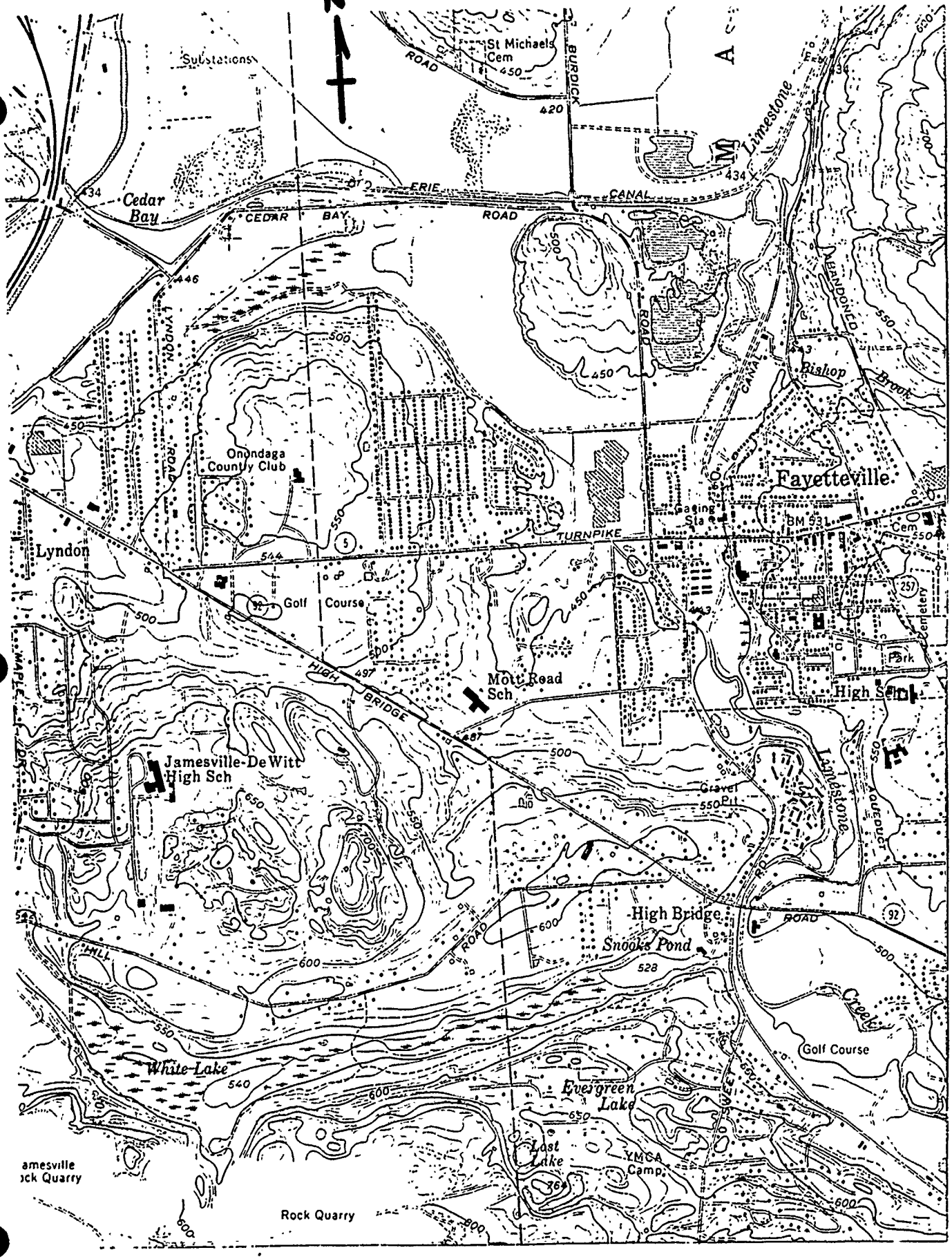
FAYETTEVILLE, NEW YORK

ENVIRONMENTAL REFERENCE FIGURES AND TABLES

U.S. Army Corps of Engineers
Buffalo District
1985



LIMESTONE CREEK AND VICINITY
ONONDAGA COUNTY NEW YORK
FIGURE 1

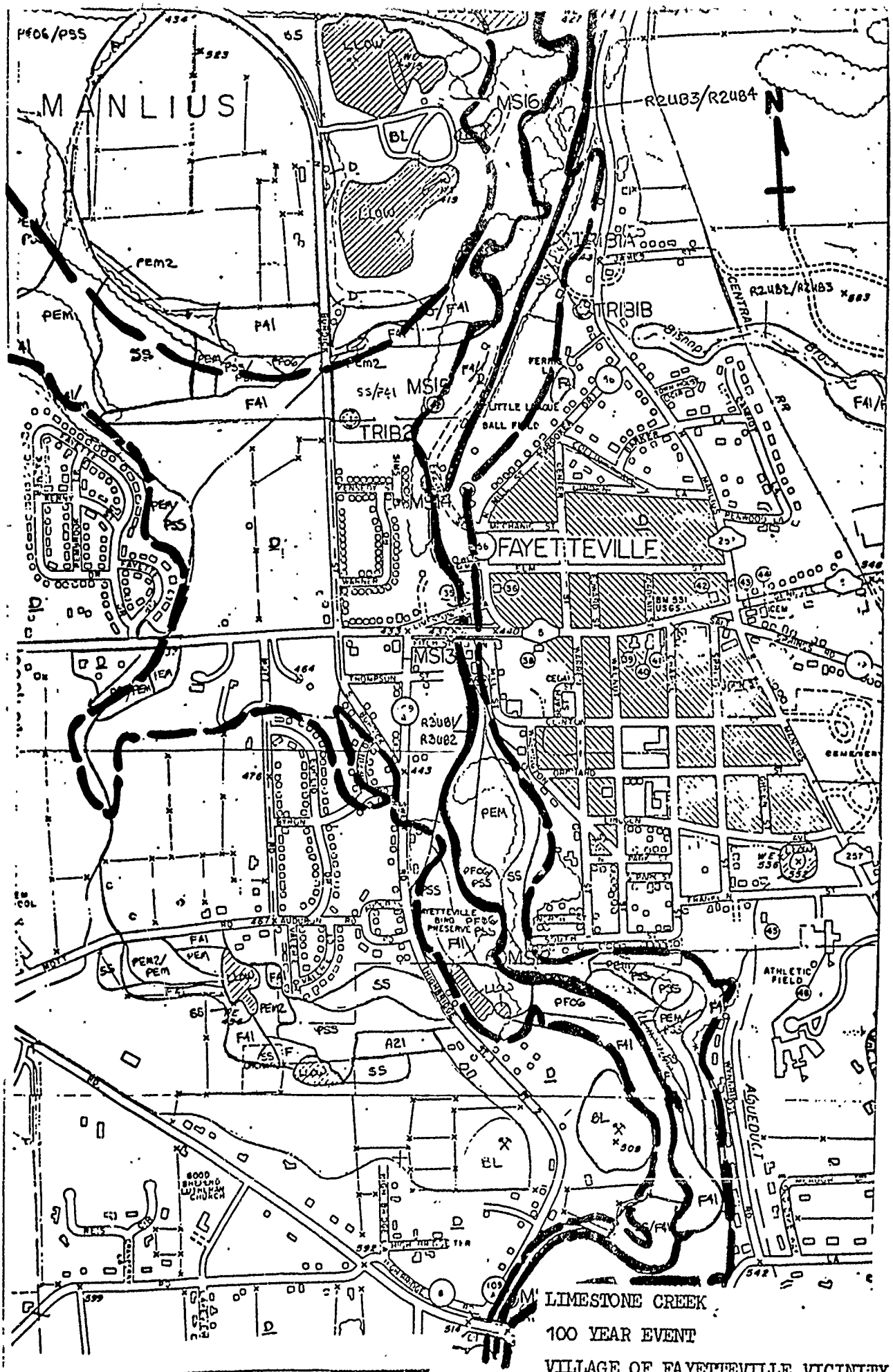


Approximate Scale
1 in. = 2000 ft.

FAYETTEVILLE PROJECT LOCALE

SOURCE: U.S.G.S. QUAD. MAP

Figure 2



LIMESTONE CREEK

100 YEAR EVENT

VILLAGE OF FAYETTEVILLE VICINITY

FIGURE 3

TABLE 1

FISH CAPTURE INFORMATION - COMBINED SPRING, SUMMER AND FALL RESULTS 1982 FOR THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT MANLIUS, NY (USFWS - 1983)

SPECIES	Sta. at Up-Stream End #	Sta. at Up-Stream End Ave. Len.	Sta. at Center #	Sta. at Center Ave. Len.	Sta. at Do-wnstr. End #	Sta. at Do-wnstr. End Ave. Len.	Sta. in Trib. Nine #	Sta. in Trib. Nine Ave. Len.	Total # Fish
Rainbow trout *Salmo gairdneri*	1	21.3							1
Brown trout *Salmo trutta*	8	14.5	10	15.4	2	14.1	38	9.1	58
Chain pickerel *Esox niger*					1	8.5			1
Cutlips minnow *Exoglossum maxillingua*	4	8.5	9	8.9	3	9.2			16
Cyprinid *Notropis sp.*					3	4.4			3
Bluntnose minnow *Pimephales notatus*	2	7.6			6	6.3			8
Blacknose dace *Rhinichthys atratulus*	18	6.3	26	6.6	16	5.4	4	7.9	64
Longnose dace *Rhinichthys cateractae*	8	8.8	2	6.9			1	8.7	11
Creek chub *Semotilus atromaculatus*					1	8.0			1
Fallfish *Semotilus corporalis*	1	10.6	6	8.4					7
Pearl dace *Semotilus margarita*	10	5.6	3	6.1	5	5.3			18
White sucker *Catostomus commersoni*	46	22.5	8	21.4	11	9.9			65
Northern hog sucker *Hypentelium nigricans*			1	15.2	1	22.3			2
Stonecat *Noturus flavus*	1	5.5							1
Banded killifish *Fundulus diaphanus*					1	6.4	1	6.5	2
Rock bass *Ambloplites rupestris*					1	12.4			1
Pumpkinseed *Lepomis gibbosus*			8	8.1	3	8.7			11
Fantail darter *Etheostoma flabellare*	7	6.2	3	5.6					10
Johnny darter *Etheostoma nigrum*			6	7.0	1	5.6			7
Mottled sculpin *Cottus bairdi*	20	6.6	9	5.6	2	5.1	17	7.4	48
Slimy sculpin *Cottus cognatus*					2	6.1	2	6.7	4
TOTALS	126		91		59		63		339

NOTE: Ave. Len. = Average Length is in centimeters.

TABLE 2

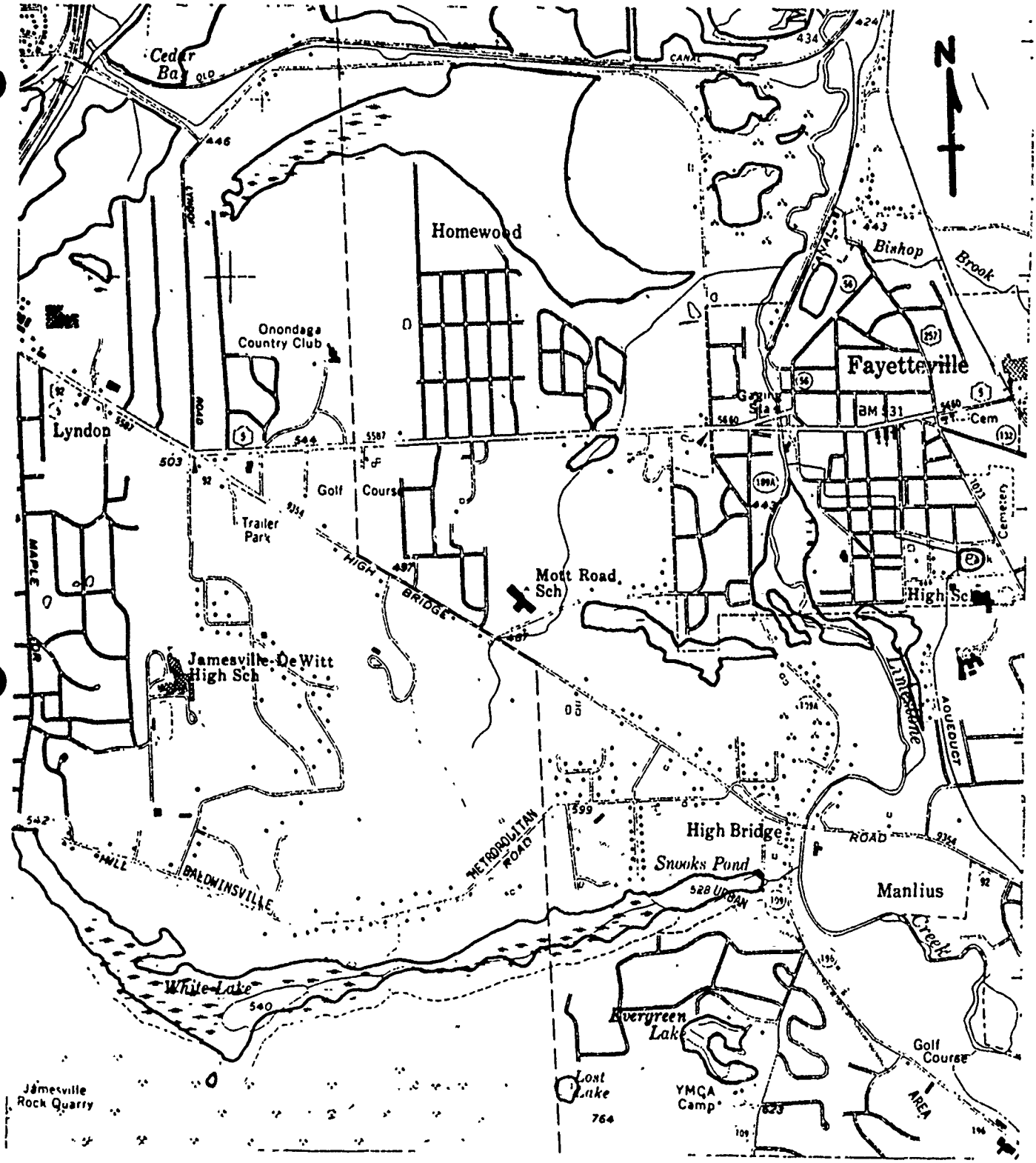
RATIO OF TROUT TO NON-TROUT FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK BETWEEN THE FEEDER CANAL DAM AND EDWARDS AND BRICKYARD FALLS AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT MANLIUS, NEW YORK AS EXTRACTED FROM THE 1983 USFWS REPORT.

STREAM REACH	RATIO
Overall within the project area	1 : 5
Main Branch portion of the project area	1 : 25
Main Branch Tributary Nine portion of the project area	2 : 1
Overall Feeder Dam to both Edwards and Brickyard Falls	1 : 8
West Branch to Brickyard Falls	1 : 12
Main and West Branch tributaries	1 : 3
Main Branch Tributary Nine	1 : 1
West Branch Tributary One	1 : 1
Overall Feeder Dam to only Edwards Falls	1 : 9

TABLE 3

INVERTEBRATES FROM THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT MANLIUS, NEW YORK AREA (USFWS - 1983) SUMMER 1982

Species	Station at Upstream end of Project	Station at Center of Project	Station at Downstream End of Proj.	Station in Tributary Nine	Total #
Aquatic earthworm Unidentified sp.				9	9
Leech Unidentified sp.				2	2
Scud Gammarus	1	22	1	156	180
Mayfly Baetis	25	1			26
Mayfly Heptagenia	54				54
Caddisfly Hydropsyche	12		7		19
Caddisfly Unidentified sp.	1	2			3
Whirligig beetle Gyrinus sp.	1	1		2	4
Elmid Stenelmis		1			1
Cranefly Antocha	1				1
Cranefly Rhaphidolabius	1				1
Blackfly (larvae) Simulium sp.	7	6	3	3	19
Midge (larvae) Unidentified sp.	54	16	19	55	144
Midge (pupae) Unidentified sp.	1		1		2
Snail Physa				1	1
Snail Unidentified sp.				2	2
TOTALS	158	49	31	230	468



Approximate Scale
1 in. = 2000 ft.

Wetland perimeter ——

Source: Onondaga County
Environmental Management Council

Limestone Creek
Fresh Water Wetlands
Fayetteville Vicinity
Figure 4

Table 4 - Population, 1980

	Onondaga County		Town of Manlius		Village of Manlius		Village of Fayetteville	
	Population	Percent Total	Population	Percent Total	Population	Percent Total	Population	Percent Total
Total	463,920	(100)	28,489	(100)	5,241	(100)	4,709	(100)
Setting								
Urban	379,284	(82)	22,536	(79)	5,241	(100)	4,709	(100)
Rural	81,847	(18)	5,953	(21)	0	0	0	
Sex								
Male	221,938	(48)	13,713	(48)	2,468	(47)	2,230	(47)
Female	241,982	(52)	14,776	(52)	2,773	(53)	2,479	(53)
Age								
0-4	30,973	(7)	1,757	(6)	326	(6)	274	(6)
5-17	97,136	(21)	6,780	(24)	1,255	(24)	1,004	(21)
18-64	284,963	(61)	17,260	(61)	3,099	(59)	2,942	(63)
65 +	50,848	(11)	2,692	(9)	561	(11)	489	(10)
Median Age Total	29.7	-	32.1	-	31.5	-	33.4	-
Male	28.5	-	30.9	-	29.5	-	32.6	-
Female	31.0	-	33.1	-	33.0	-	34.2	-
Race								
White	424,786	(92)	28,051	(98)	5,106	(97)	4,658	(99)
Black	30,117	(7)	76	(<1)	12	(1)	18	(<1)
American Indian, Eskimo, Aleut	3,274	(<1)	73	(<1)	11	(1)	4	(<1)
Asian & Pacific Islander	2,814	(<1)	223	(<1)	89	(2)	16	(<1)
Other	2,929	(<1)	66	(<1)	23	(1)	13	(<1)
Families	116,457	-	7,756	-	1,370	-	1,312	-
Households	165,677	-	9,633	-	1,917	-	1,778	-
Households with Persons 65 Years and Over	36,634	-	1,841	-	423	-	373	-

SOURCE: Census of Population and Housing, 1980; U. S. Census Bureau.

Table 5 - Projected Population, County and Local

Vicinity	1970 (1)		1980 (1)	Percent:	1980 (2)	Percent:	1990 (1)	Percent:	2000 (1)	Percent
Onondaga County	472,800		477,400	(1)	463,920	(-2)	504,800	(6)	544,300	(8)
Town of Manlius	26,100		29,400	(13)	28,489	(9)	31,100	(6)	33,700	(8)
Village of Manlius	4,300		6,100	(42)	5,241	(22)	6,400	(5)	6,900	(8)
Village of Fayetteville	5,000		5,600	(12)	4,709	(-6)	6,000	(7)	6,500	(8)

SOURCE: (1) New York State Water Quality Management Plan Population Projections, 15 January 1981. New York State Department of Environmental Conservation.
(2) Census of Population and Housing, 1980. U. S. Census Bureau.

SMSA 8160: Syracuse, New York

Table 6 -Population, Personal Income, and Labor and Proprietors' Income, 1969 and 1978, and Projected, 1985-2030

	Historical		No-change-in-share				Low-change-in-share				Moderate-change-in-share			
	1969[1]	1978[2]	1985	1990	2000	2030	1985	1990	2000	2030	1985	1990	2000	2030
Population (July 1)	631,763	649,632	631,762	623,982	601,950	583,342	660,105	659,878	642,381	624,689	669,046	676,592	669,200	660,568
	Thousands of 1972 dollars													
Total personal income (place of residence)	2,561,197	3,114,123	3,667,022	4,073,989	4,795,926	7,960,925	3,830,041	4,306,468	5,116,231	8,417,454	3,883,189	4,414,589	5,328,245	8,898,819
By place of work														
Total labor and proprietors' income[3]	2,131,334	2,459,458	2,930,379	3,259,090	3,831,507	6,285,577	3,085,399	3,481,021	4,137,373	6,817,002	3,136,739	3,586,699	4,346,507	7,294,700
Agricultural production	31,117	20,958	22,976	24,005	26,569	39,792	22,821	23,796	26,300	39,369	22,768	23,694	26,107	38,969
Nonfarm	2,100,217	2,438,500	2,907,403	3,235,086	3,804,938	6,245,785	3,062,578	3,457,225	4,111,074	6,777,633	3,113,971	3,563,005	4,320,400	7,255,731
Private	1,786,148	2,054,996	2,474,863	2,763,376	3,259,016	5,370,712	2,611,676	2,959,873	3,530,555	5,844,576	2,656,970	3,053,364	3,715,987	6,269,946
Agricultural services, forestry, fisheries, and other[4]	4,365	4,301	5,391	6,215	7,764	14,279	5,128	5,829	7,203	13,199	5,041	5,646	6,823	12,240
Mining	3,782	5,525	6,511	7,000	7,888	11,534	6,617	7,118	8,014	11,714	6,722	7,262	8,178	11,907
Construction	144,458	122,882	164,591	201,531	282,330	602,268	174,746	217,401	308,161	659,908	178,076	224,852	325,490	710,490
Manufacturing	683,832	767,945	881,890	950,319	1,051,666	1,547,760	907,490	984,893	1,094,724	1,611,247	915,601	1,000,282	1,121,404	1,661,332
Nondurable goods	189,776	223,800	243,787	259,525	278,298	389,462	265,254	288,909	315,111	443,427	272,500	303,316	341,306	494,248
Durable goods	494,056	544,145	638,102	690,794	773,369	1,158,299	642,236	695,984	779,614	1,167,820	643,101	696,966	780,099	1,167,084
Transportation and public utilities	161,658	197,945	240,126	271,593	321,915	531,885	252,799	289,941	347,238	575,665	257,006	298,715	364,655	615,261
Wholesale trade	157,539	207,330	242,328	262,196	291,596	434,589	266,971	296,347	335,830	503,574	275,163	312,664	366,088	565,348
Retail trade	220,689	207,578	239,519	262,233	305,760	494,145	249,295	275,846	324,154	525,203	252,460	282,114	336,163	551,591
Finance, insurance, and real estate	105,932	139,581	176,663	201,216	240,857	401,898	196,194	229,899	281,050	472,199	202,860	244,186	310,247	540,015
Services	303,893	401,909	517,845	601,071	749,240	1,332,334	552,437	652,599	824,179	1,471,868	564,040	677,642	876,938	1,601,762
Government	314,069	383,505	432,540	471,710	545,922	875,072	450,902	497,352	580,518	933,056	457,001	509,640	604,413	985,785
Federal civilian	43,396	57,518	68,026	75,656	91,709	158,900	71,942	81,216	99,543	173,094	73,227	83,832	104,809	185,575
Federal military	13,628	13,050	15,161	17,012	20,751	38,543	15,161	17,012	20,751	38,543	15,161	17,012	20,751	38,543
State and local	257,045	312,937	349,353	379,042	433,461	677,630	363,799	399,124	460,224	721,420	368,613	408,796	478,853	761,668

Table 7 -Employment by Industry by Place of Work, 1969 and 1978, and Projected, 1985-2030

[Total number of jobs]

	Historical		No-change-in-share				Low-change in-share				Moderate-change-in-share			
	1969[1]	1978[2]	1985	1990	2000	2030	1985	1990	2000	2030	1985	1990	2000	2030
Total employment	255,098	280,675	294,340	295,330	286,497	261,085	309,008	314,230	307,919	281,683	313,632	323,143	322,380	299,925
Agricultural production	4,216	4,299	4,038	3,832	3,560	3,032	3,934	3,766	3,508	2,969	3,966	3,734	3,458	2,910
Nonfarm	250,852	276,376	290,302	291,498	282,917	258,052	305,023	310,464	304,411	278,714	309,865	319,408	318,922	297,015
Private	207,003	226,889	240,587	242,312	235,610	214,857	253,404	258,866	254,403	232,942	257,614	266,655	267,050	248,901
Agricultural services, forestry, fisheries, and other[4]	661	708	753	787	799	787	713	734	736	723	700	709	694	666
Mining	384	421	437	427	403	340	443	433	408	341	449	440	414	347
Construction	13,156	12,566	14,867	16,131	18,159	20,689	15,718	17,307	19,696	22,520	15,995	17,854	20,714	24,102
Manufacturing	67,902	60,886	60,340	58,134	52,194	41,718	62,340	60,557	54,667	43,747	62,975	61,640	56,212	45,374
Nondurable goods	20,810	19,753	18,874	18,004	15,815	12,355	20,462	19,949	17,810	13,987	20,995	20,895	19,212	15,501
Durable goods	47,164	41,133	41,466	40,130	36,379	29,363	41,878	40,608	36,858	29,760	41,980	40,745	37,000	29,872
Transportation and public utilities	14,760	15,021	15,144	14,388	14,158	12,345	15 889	15,930	15,193	13,289	16,135	16,376	15 894	14,127
Wholesale trade	15,592	19,574	20,570	20,221	19,753	15,849	22,427	22,550	21,261	18,065	23,033	23,635	22,919	19,969
Retail trade	38,567	42,594	43,975	44,060	42,851	39,479	45,508	46,009	45,043	40,535	45,999	46,893	46,447	42,241
Finance, insurance, and real estate	12,636	16,459	18,442	18,804	18,200	16,401	20,305	21,247	20,962	19,007	20,933	22,441	22,916	21,445
Services	43,245	58,660	66,058	68,760	70,094	68,249	70,061	74,099	76,437	74,713	71,394	76,667	80,840	80,632
Government	43,849	49,487	49,715	49,186	47,307	43,196	51,619	51,598	50,008	45,772	52,251	52,753	51,872	48,114
Federal $296,681									322,402	352,873	276,515	294,369	319,187	349,093
Federal military	4,259	3,046	3,034	3,034	3,034	3,034	3,034	3,034	3,034	3,034	3,034	3,034	3,034	3,034
State and local	35,249	41,783	42,027	41,468	39,559	35,440	43,665	43,537	41,859	37,596	44,209	44,530	43,453	39,568

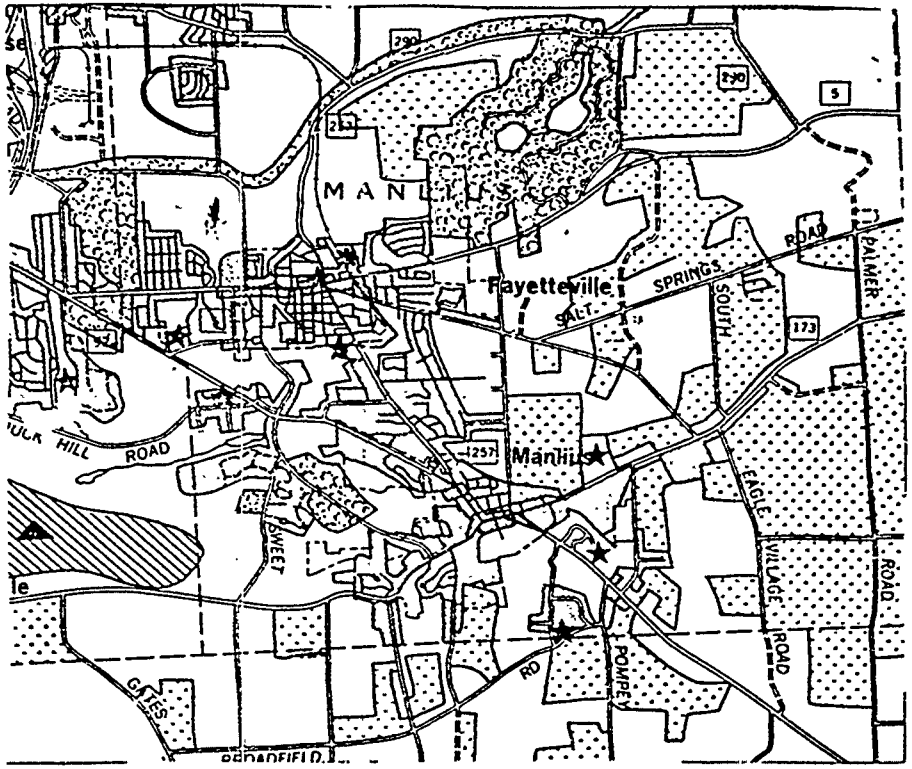
See footnotes on page 2

Source: 1980 OBERS
BEA Regional Projections
Vol. 3 Standard Metropolitan Statistical Areas
U.S. Dept. of Commerce

Table 8 - Existing and Projected Land Use in the Town of Manlius, Onondaga County, NY - 1980, 1995

Category	Onondaga County 1980	Percent of Total	Onondaga County 1995	Percent Change	Town of Manlius 1980	Percent of Total	Town of Manlius 1995	Percent Change
Residential								
High Density	2,887	.6	3,870	34.0	300	1.0	450	.5
Medium Density	32,900	6.4	41,900	27.4	2,462	7.9	3,100	25.9
Low Density	2,112	.4	2,600	23.1	50	.2	50	0
Commercial	3,286	.6	3,709	12.9	163	.5	200	22.7
Industrial	18,764	3.6	19,600	4.5	306	1.0	325	6.2
Institutional	5,080	1.0	5,170	1.8	232	.7	240	3.4
Agricultural	132,125	25.7	128,600	-2.7	3,375	.8	3,000	-11.1
Open Space	265,507	51.6	255,791	-3.7	20,529	66.0	19,940	-2.9
Recreation	11,841	2.3	11,841	0	2,100	6.8	2,100	0
Transportation	23,974	4.7	25,395	5.9	1,288	4.1	1,400	8.7
Water	15,949	3.1	15,949	0	320	1.0	320	0
TOTAL	514,424	100	514,424	-	31,125	100	31,125	-

SOURCE: Onondaga County, 1995 Land Use Plan; Syracuse-Onondaga County Planning Agency; July 1977.

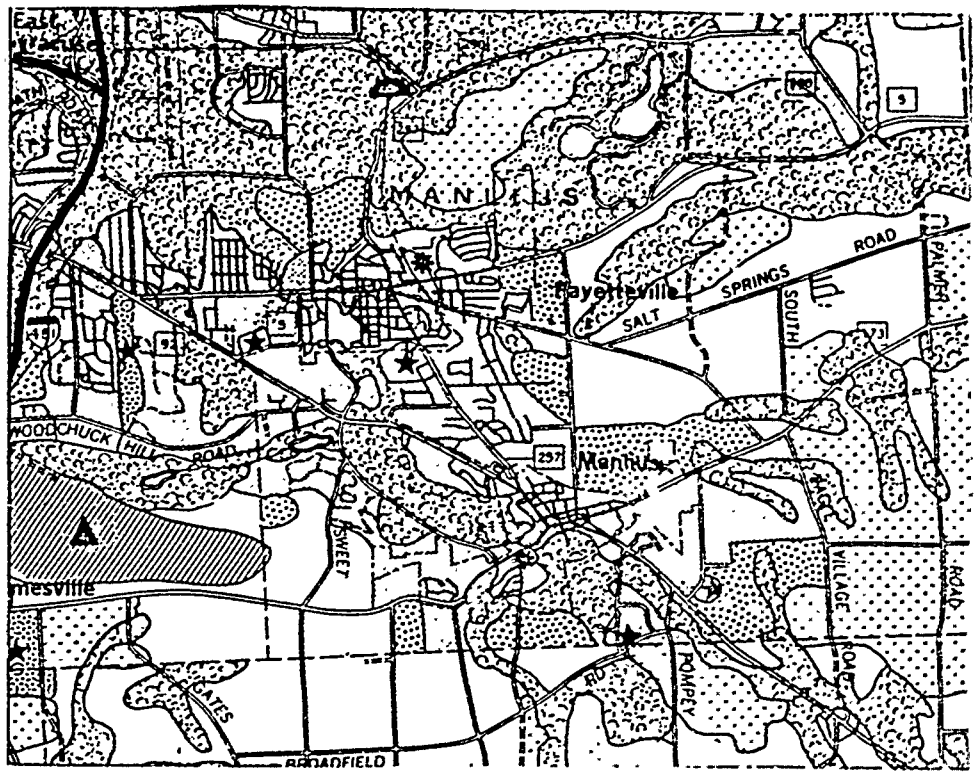


KEY TO SYMBOLS

- SCATTERED RESIDENTIAL & NON DEVELOPING
- MEDIUM INTENSITY RESIDENTIAL
- HIGH INTENSITY RESIDENTIAL
- FARM AREAS
- INSTITUTIONAL
- COMMERCIAL
- EXTRACTIVE
- INDUSTRIAL
- RECREATION

EXISTING LAND USE 1972

SOURCE: ONONDAGA CO. PLANNING

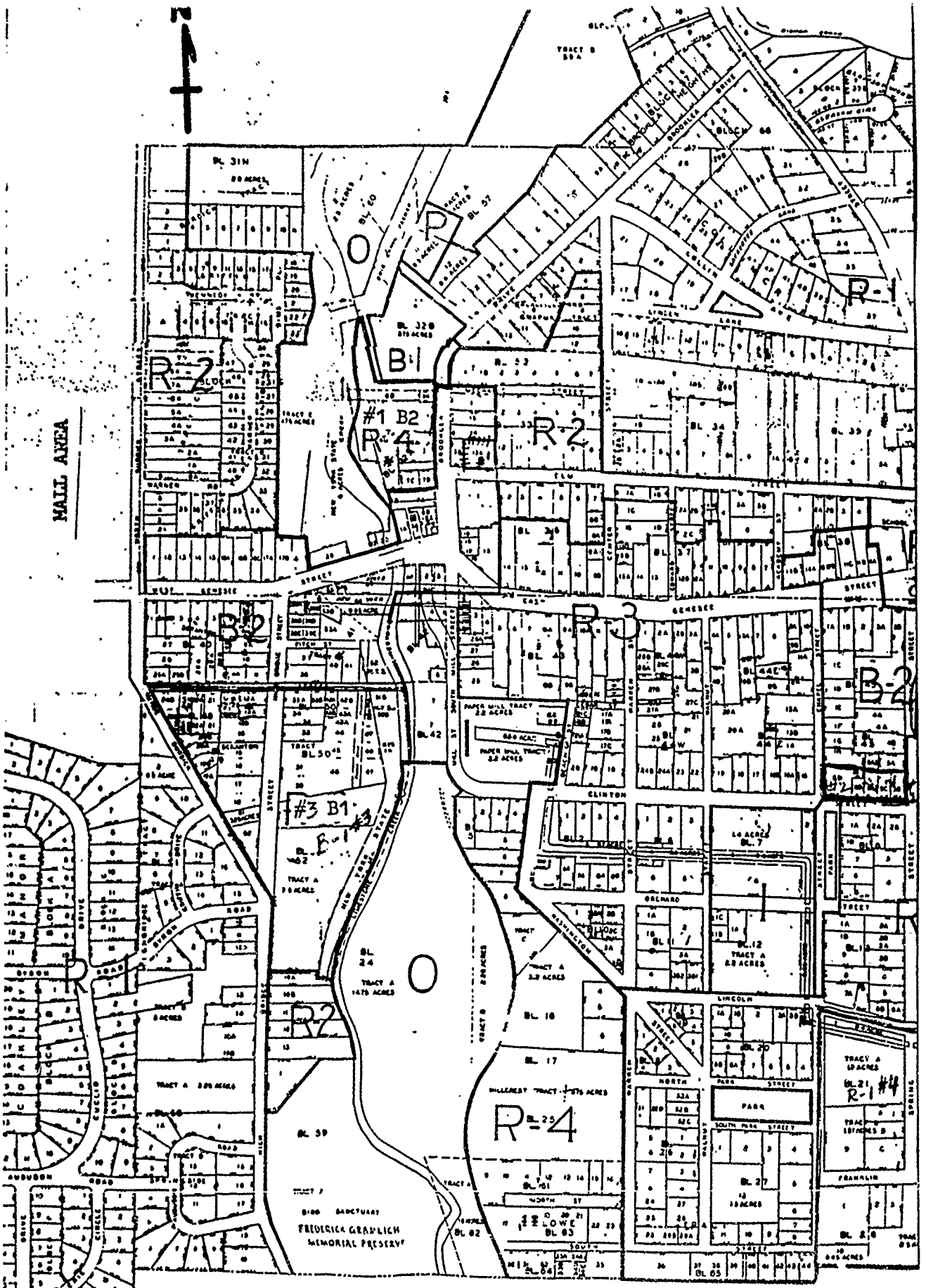


KEY TO SYMBOLS

- SCATTERED RESIDENTIAL & NON-DEVELOPING
- MEDIUM INTENSITY RESIDENTIAL
- HIGH INTENSITY RESIDENTIAL
- PROTECTED OPEN SPACE
- SEWAGE TREATMENT PLANT
- FARM AREAS
- IDLE LAND
- INSTITUTIONAL
- EXTRACTIVE
- COMMERCIAL
- INDUSTRIAL

FUTURE LAND USE 1995

SOURCE: ONONDAGA CO. PLANNING



#1 Zone changed R4 to B2
Jan 1968

#3 Zone changed R3 to B1
April 1973

Approximate Scale
1 in. = 8000 ft.

VILLAGE OF FAYETTEVILLE

ZONING MAP

Figure 5C

Table 9 - Housing, 1980

Category	Onondaga County	Total	Town of Manlius	Total	Village of Manlius	Total	Village of Fayetteville	Total
Total Housing Units (Year Round)	175,511	(100)	9,864	(100)	1,958	(100)	1,820	(100)
Occupied Housing Units (Year Round) by Tenure								
Total	165,677	(94)	9,633	(98)	1,917	(98)	1,778	(98)
Owner Occupied	102,415		7,462		1,109		1,316	
Renter Occupied	63,262		2,171		808		462	
Vacant Housing Units (Year Round) by Vacancy Status								
Total	9,834	(6)	231	(2)	41	(2)	42	(2)
For Sale	1,114		81		15		21	
For Rent	4,254		45		9		8	
Held for Occasional Use	500		11		-		-	
Other Vacants	3,966		94		17		13	
Vacant Housing Units which are Borded-Up	1,073		5		2		1	
Mean Rooms in Year-Round Housing Units by Tenure and Vacancy Status								
Total	5.6		6.4		6.2		6.2	
Owner Occupied	6.6		7.0		7.7		7.0	
Renter Occupied	4.3		4.4		4.2		4.2	
Vacant for Sale Only	6.3		6.5		6.9		5.2	
Vacant for Rent	3.9		4.4		4.4		3.0	
Other Vacant	5.1		6.3		6.3		6.4	
Persons Per Unit	2.72		2.93		2.72		2.65	
Year-Round Housing Units by Tenure and Occupancy Status by Plumbing Facilities								
Total								
Complete Plumbing	172,683	(98)	9,811	(99)	1,948	(99)	1,817	(99+)
Lacking Complete Plumbing	2,828	(2)	53	(1)	10	(1)	3	(<1)
Total Occupied								
Complete Plumbing	163,438	(99)	9,587	(99+)	1,907	(99)	1,775	(99+)
Lacking Complete Plumbing	2,239	(1)	46	(<1)	10	(1)	3	(<1)
Total Renter Occupied								
Complete Plumbing	61,543	(97)	2,142	(99)	801	(99)	459	(99)
Lacking Complete Plumbing	1,719	(3)	29	(1)	7	(1)	3	(1)
Specified Owner Occupied Noncondominium Housing Unit Values								
Median Value	$38,600		$48,900		$62,600		$53,300	
Specified Owner Occupied and Vacant For-Sale-Only Housing Units by Occupancy Status by Condominium Status								
Non-Condominium								
Mean Value or Price Asked								
Owner Occupied	$42,400		$35,600		$62,800		$52,600	
Vacant For-Sale-Only	$45,700		$71,100		$70,800		$46,300	
Condominium								
Mean Value or Price Asked								
Owner Occupied	$37,700		$79,600		-		$64,900	
Vacant For-Sale-Only	$38,800		$58,000		-		$50,000	
Median Contract Rent for Specified Renter Occupied Housing Units Paying Cash Rent	$ 187		$ 233		$ 227		$ 235	

SOURCE: Census of Population and Housing, 1980; U. S. Census Bureau.

Table 10- Employment and Income, 976

Area or County	Estimated Population 1978	Civilian Labor Force 1978	Employment 1978	Rate Percent	Personal Income (Million $) 1978	Per Capita 1978
New York State	17,748,000	7,838,000	7,236,000	(92)	146,059.4	8,230
Syracuse SMSA	775,400	295,800	276,300	(93)	4,671.2	7,191
Onondaga County	473,500	214,300	201,400	(94)	3,572.9	7,546

SOURCE: New York State Business Fact Book, 1972 and 1980 Supplements, New York State Department of Commerce.

Table 11- Employment, 1970 and 1978 (Covered by Unemployment Insruance)

	Total			Manufacturing			Construction		
	1970	1978	Percent	1970	1978	Percent	1970	1978	Percen
New York State	5,416,937	5,684,399		1,757,041	1,486,349		266,649	199,824	
Percent of Total	(100)	(100)		(32.4)	(26.1)		(4.9)	(3.5)	
Syracuse SMSA	166,002	199,119		62,898	60,171		9,541	9,549	
Percent of Total	(100)	(100)		(37.9)	(30.2)		(5.7)	(4.8)	
Onondaga County	144,704	169,714		54,350	49,481		7,920	7,363	
Percent of Total	(100)	(100)		(37.6)	(29.2)		(5.5)	(4.3)	

	Wholesale			Retail Trade			Services		
	1970	1978	Percent	1970	1978	Percent	1970	1978	Percen
New York State	454,260	442,351		987,9[illegible]	1,013,034		868,846	1,507,785	
Percent of Total	(8.4)	(7.8)		(18.2	17.8)		(16.0)	(26.5)	
Syracuse SMSA	14,713	17,645		33,49[illegible]	38,384		19,828	44,403	
Percent of Total	(8.9)	(8.9)		(20.2)	(19.3)		(11.9)	(22.3)	
Onondaga County	14,128	16,307		27,697	32,040		17,251	38,639	
Percent of Total	(9.8)	(9.6)		(19.1)	(18.9)		(11.9)	(22.8)	

	Transportation, Communication Public Utilities			Finance, Insurance Real Estate			All Other Including Unassigned		
	1970	1978	Percent	1970	1978	Percent	1970	1978	Percent
New York State	466,548	408,460		585,022	583,403		28,655	43,192	
Percent of Total	(8.6)	(7.2)		(10.8)	(10.3)		(.5)	(.8)	
Syracuse SMSA	12,813	12,971		11,899	14,779		811	1,216	
Percent of Total	(7.7)	(6.5)		(7.2)	(7.4)		(.5)	(.6)	
Onondaga County	11,636	11,357		11,114	13,739		607	787	
Percent of Total	(8.0)	(6.7)		(7.7)	(8.1)		(.4)	(.5)	

NOTE: Syracuse SMSA - Madison, Onondaga, and Oswego Counties.

SOURCE: New York State Business Fact Book, 1972 and 1980 Supplements, New York State Department of Commerce.

Approximate Scale
3/4 in. = 1000 ft.

INCLUDED ON LIST OF:
ONONDAGA COUNTY, NEW YORK
PRIME FARMLAND MAPPING UNITS

CfB	Cazenovia silt loam, 2 to 8 % slope
Hb	Hamlin silt loam
Hc	Hamlin silt loam, high bottom
HyA	Howard gravelly silt loam, 0 to 3 % slope
PgB	Palmyra gravelly loam, 3 to 8 % slope
Te	Teel silt loam

Source: Soil Survey of Onondaga County, New York
U.S. Dept. of Agriculture
Soil Conservation Service

LIMESTONE CREEK PROJECT
FAYETTEVILLE VICINITY
ONONDAGA CO., NEW YORK
SOIL SURVEY MAPS

FIGURE 6

Environmental Appendix

U.S. Army Corps of Engineers
Buffalo District

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FAYETTEVILLE, NEW YORK

ENV. APPEN. B - U.S. FISH AND WILDLIFE SERVICE COORDINATION ACT REPORT

U.S. Army Corps of Engineers
Buffalo District

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
100 Grange Place
Room 202
Cortland, New York 13045

July 2, 1984

Colonel Robert R. Hardiman
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Attention: Tod Smith

Dear Colonel Hardiman:

This constitutes our report on the potential effects the proposed Limestone Creek Flood Control Project at Fayetteville, New York, would have on fish and wildlife resources. It has been prepared under the authority of Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.).

Your investigations of flooding on Limestone Creek are being conducted under the authority of Section 205 of the 1948 Flood Control Act as amended. The proposed project will be constructed under the same authority if granted by the Chief of Engineers or the Secretary of the Army following completion of the final detailed project report and environmental impact statement.

Our report is based on project plans and other information provided by your staff through April 2, 1984; biological information provided by the New York State Department of Environmental Conservation (NYSDEC); biological and other information provided by the Onondaga Environmental Management Council; and field studies undertaken by the United States Fish and Wildlife Service (USFWS) personnel. This report was prepared by Michael F. Stoll, Project Biologist, under the supervision of Paul P. Hamilton, Field Supervisor, USFWS, Cortland, New York. Our analysis is based on a fifty year project life.

This report has been reviewed and endorsed by the Division of Fish and Wildlife, NYSDEC, as signified by the attached letter from Director Kenneth F. Wich, dated June 27, 1984 (Exhibit 1).

DESCRIPTION OF THE PROJECT

The proposed project consists of Option A (Figure 1). Option A consists of about 3,500 linear feet of earthen levee riprap protected 6 to 11.5 feet high with a top width of 8 to 10 feet and sideslopes of 1 on 3 except on the landward side in the extreme south; about 400 linear feet of earthen berm

riprap protected, similar to the levee but somewhat smaller in overall dimensions; about 800 linear feet of steel sheet pile concrete capped floodwall with a top width of about 2 feet and a maximum height of 11.9 feet; and probable relocation of several residences located on the land mass between the Creek and the Feeder Canal and one municipal building to the east of the latter. Option A also calls for clearing and snagging in about 1,600 linear feet of the Creek channel, and placement of stone riprap between the floodwall and the Creek channel.

Under Option A about 4.38 acres to 7.14 acres of riparian habitat adjacent to the Creek or Feeder Canal will be at least temporarily disturbed if not destroyed. Depending on the extent of clearing and snagging, up to 800 - 900 linear feet of stream bank on the east side of the Creek channel south of the proposed floodwall also would be adversely impacted.

AQUATIC AND TERRESTRIAL RESOURCES

While the approximately 7,000 linear feet of shoreline habitat of the Creek and Feeder Canal affected by the project are classified as Developed (commercial/industrial/residential/etc) (see Figure 2), a narrow band of riparian vegetation exists along most of it. This narrow band of riparian vegetation runs the gamut from grasses to mature trees (see Table 1) and provides habitat for a variety of wildlife. Raccoons (Procyon lotor), muskrats (Ondatra zibethica), eastern cottontail rabbits (Sylvilagus floridanus), mallards (Anas platyrhynchos), crows (Corvus caurinus), and other avians were observed in conjunction with 1982 field work. The Fayetteville Bird Preserve is located along the Creek just east of Sweet Road at Audubon Road approximately 700 feet upstream of the point where the proposed levee will tie back to high ground. The value of the narrow band of riparian vegetation, which serves indigenous wildlife for resting, feeding, and breeding, is enhanced by being located in the middle of a heavily urbanized area.

Land use in the project area consists of urbanized areas, light industry, parkland, and scrub-shrub to deciduous forest. Some species of deciduous woody vegetation and herbaceous understory observed in the riparian zone of Limestone Creek were boxelder, eastern cottonwood, willows, staghorn sumac, wild grape, virginia-creeper, coltsfoot, aster, goldenrod, and purple loosestrife. A complete listing for the project area is provided in Table 1.

The bald eagle (Haliaeetus leucocephalus) and the peregrine falcon (Falco peregrinus) may make transitory use of, but are not known to be residents of, the area (USFWS - 1982 and NYSDEC - 1979). The Federally listed small whorled pogonia (Isotria medeoloides) is reported from the Limestone Creek drainage, but since it requires a dry wooded area with acid soil habitat (Gleason 1963) it is not likely found in the project area. Several other species of fish and wildlife found in the project area are provided protection by NYS, however, only the above species are provided protection under threatened and endangered status by NYS or the Federal Government.

The Creek, in the project area, is classified as C(t) south of the NYS Route 5 Bridge and C north of it by the NYSDEC (6NYCRR399.4). The Feeder Canal is also classified as C. Class C waters are suitable for fishing and other uses except

as a source of water supply for drinking, culinary or food processing purposes. The addition of the (t) means that the water body is suitable for trout and the water quality specification for dissolved oxygen of not less than 5.0 parts per million applies. The NYS Route 5 Bridge is located about 1,000 feet north of the Feeder Dam which divides the Creek into two main reaches and also separates them from the Feeder Canal. The Feeder Dam also acts as a barrier to upstream migration by fish. About 2,900 linear feet of the proposed project lie to the south of the Feeder Dam.

Brown and rainbow trout are reported from the project area both by the NYSDEC and the USFWS. Recent contact with the NYSDEC, Cortland, New York indicates continued stocking of brown and rainbow trout. In addition to the trout mentioned above, the following species were collected by the USFWS during sampling in 1982: pumpkinseed, rockbass, cutlips minnow, spottail shiner, bluntnose minnow, fathead minnow, blacknose dace, finescale dace, longnose dace, fallfish, white sucker, creek chub, pearl dace, northern hog sucker, banded killifish, fantail darter, Johnny darter, channel darter, and mottled sculpin. Additionally, in 1983 the NYSDEC reported collection of common shiner and wild brown trout young-of-year below the Feeder Dam. Table 2 and 3 provide a summary of where fish were taken and their average length. The ratio of trout to non-trout species was 1:14 for the Creek overall, 1:9 south of the Feeder Dam, and 1:45 north of the Feeder Dam. The ratio of gamefish to non-gamefish species was 1:11 for the Creek overall, 1:8 south of the Feeder Dam, and 1:14 south of the Feeder Dam (see Tables 4 & 5). The forage base for fish species is described in Table 6. The fishery is better upstream than downstream of the Feeder Dam.

There is no formal fishermen access in the project area or the areas influenced by the project. Informal access is obtained at the road crossings, other public areas, or where it is not specifically prohibited. A specific number of angler use days is unavailable, however, fishermen were observed in the area affected by the project, primarily south of the NYS Route 5 Bridge during the Service's 1982 fieldwork.

The NYSDEC (1970) and the USFWS (1983) report that the area affected by the project supports a quality coldwater (trout) fishery. The NYSDEC has placed Limestone Creek among the top 50 trout streams of the State. Excellent stream channel configuration, instream structure and substrate, variable instream flow regime, water quality, aquatic and riparian vegetation, and forage base provides an excellent aquatic habitat south of the NYS Route 5 Bridge. North of the above bridge the Creek becomes considerably wider and deeper in the reach immediately upstream of the Feeder Dam. Below the Feeder Dam the Creek is characterized by a series of deep holes and shallow runs; while some trout were taken in this section, it is more typically a warmwater fishery. Due to the location of the Feeder Dam, there is no real transition from coldwater to warmwater fishery. The reach bounded by the NYS Route 5 Bridge and the Feeder Dam might be considered a transition zone, however, it was not sampled.

PROJECT IMPACTS ON AQUATIC AND TERRESTRIAL RESOURCES

Degradation of water quality will result largely from temporary siltation and erosion associated with levee construction and clearing and snagging activities. Adverse impact will be limited to the construction period and

extent of actual alteration. Riprap protection of levees along the Creek bank would contribute toward improved protection to riparian soils, by reducing soil loss from scouring due to swift Creek flows. Alteration of stream channel configuration will result from the loss of instream structure and siltation associated with clearing and snagging. Adverse impact will depend on the actual extent of construction activities. Alteration or destruction of terrestrial or riparian vegetation will result in the disturbance, alteration and/or destruction of about 4.38 acres to 7.14 acres of existing woody and herbaceous vegetation depending on the final project design. The actual effect on fish and wildlife resources will depend on the extent of alteration and duration of construction ativities.

Under Option A the levee, berm and floodwall will adversely impact an average of 6.50 acres, 0.70 acres, and 0.02 acres respectively. Most of this acreage is classified by the Service as Developed, however, the northernmost portion of the levee extends into an area classified as Upland, Scrub/Shrub-Forested, Deciduous. Irregardless, immediately adjacent to the Creek, especially south of the NYS Route 5 Bridge, a narrow band of mixed woody and herbaceous riparian vegetation exists. Loss or reduction of this narrow band of riparian vegetation which provides escape habitat for wildlife foraging in the surrounding area may cause decreased diversity in indigenous wildlife, loss of feeding habitat, and loss of nesting habitat. Reduction of the riparian vegetation will also decrease the shading effect it has on the Creek, resulting in higher temperatures, which could affect the indigenous fish population. The recommended maximum temperature is 70°F for rainbow trout and 75°F for brown trout (Scott & Crossman 1973). A significant rise in temperature would decrease the value of the existing coldwater fishery. At this time it is not possible to quantify the rise in instream temperature which may occur as a result of the project.

The municipal building east of the Feeder Canal and the residences on the land mass between the Creek and Feeder Canal are to be relocated. Hopefully, the vacated land could be returned to a structure free, vegetated condition and dedicated as open space parkland.

In summary, adverse impacts upon fish and wildlife resources will vary depending upon the duration and extent of construction activities. Clearing and snagging may adversely impact up to 900 linear feet of stream channel. All of the 900 linear feet are above the feeder dam and in the reach containing a better fishery. Approximately 4.4 to 7.1 acres of streamside (riparian) vegetation will be destroyed or disturbed by levee, berm, and floodwall construction. The actual extent of the adverse impact will depend upon whether it is returned to vegetated or non-vegetated habitat.

PLAN OF DEVELOPMENT FOR AQUATIC AND TERRESTRIAL RESOURCES

Existing riparian vegetation to the extent possible should not be disturbed and clearing and snagging should be conducted from the west bank only. All areas disturbed during construction should be revegetated as soon as possible to mitigate for wildlife habitat losses. The destruction of vegetation should be kept to a minimum since it develops slowly and is not readily replaced,

especially in the case of woody streamside vegetation. A strategy for minimizing destruction of vegetation and a revegetation plan should be developed for the project in coordination with the NYSDEC and USFWS prior to beginning construction. The plan should include provisions for monitoring of growth conditions to ensure that revegetation is successful. All replanting, maintenance of replanted vegetation, and associated monitoring activities should be funded as project costs. In order to protect the existing coldwater and warmwater fisheries, a plan should be developed by the United States Army Corps of Engineers in coordination with the NYSDEC, USFWS, the United States Soil Conservation Service, and the United States Environmental Protection Agency to minimize the amount of project caused siltation, turbidity and alteration of water quality.

Consideration should be given to dedicating the land between the Feeder Canal and Limestone Creek to wooded parkland or as vegetated open space land with a minimum of manmade structures after residents have been relocated. The above could be considered as partial mitigation for potential disturbance of fish and wildlife habitat resulting from levee and floodwall construction and/or clearing and snagging activities.

Lastly, while there is no formal fishermen access in the project area, informal fishermen access is readily available at several locations such as the public parking areas under the east portion of the NYS Route 5 Bridge and in the vicinity of the Feeder Dam. Provision of fishermen access should be provided to the extent possible. This is particularly important in the case of the sheer sided steel sheet pile floodwall proposed for the east side of the Creek. Traffic patterns in the area, depth of the Creek along the west creek bank, and lack of parking severely limit fishermen access from other points in the vicinity. Provision of fishermen access at the floodwall adjacent to the parking lot could mitigate the loss of informal access which currently exists.

RECOMMENDATIONS

To mitigate for losses of fish and wildlife habitat, we recommend that:

1. The land between the Creek and Feeder Canal after relocation of the residents be revegetated and dedicated to wooded parkland or vegetated open space land with a minimum of manmade structures.

2. A narrow band of riparian vegetation, preferably the existing, be maintained along the margin of the Creek.

3. Fishermen access be provided in the vicinity of the floodwall as part of the project.

4. Destruction and/or disturbance of both riparian and terrestrial vegetation be avoided where possible during construction.

5. Prior to construction a revegetation plan be developed for the project area in coordination with the New York State Department of Environmental Conservation and the United States Fish and Wildlife Service. The plan should include provisions for monitoring growth to ascertain successful revegetation.

6. Prior to construction an erosion and/or siltation control plan be developed in coordination with the New York State Department of Environmental Conservation, United States Fish and Wildlife Service, United States Environmental Protection Agency and the United States Soil Conservation Service. Dredging and other turbidity producing work should not occur between October 1 and ~~July~~ June 1.

Please continue to coordinate this project with us as it develops, and advise us of any changes or additions to the project so that we may revise or supplement this report as necessary.

Sincerely,

Paul P. Hamilton

Paul P. Hamilton
Field Supervisor

REFERENCES

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New York State Department of Environmental Conservation. Division of Water Resources. 6NYCRR 899.4. Classes and Standards of Quality and Purity Assigned to Fresh Surface and Tidal Salt Waters.

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Scott, W.B. and E.J. Crossman. 1973. Freshwater Fishes of Canada. Bulletin 184. Fisheries Research Board of Canada, Ottawa.

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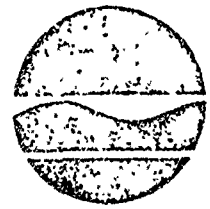
_____. 1982. Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12. Department of the Interior. Reprinted January 1.

EXHIBIT 1

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001



Henry G. Williams
Commissioner

June 27, 1984

Mr. Paul Hamilton
Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
100 Grange Place, Room 202
Cortland, New York 13045

Dear Mr. Hamilton:

This letter constitutes the response of the Division of Fish and Wildlife of the New York State Department of Environmental Conservation to the Fish and Wildlife Coordination Report for the proposed flood control project on Limestone Creek, Fayetteville, Onondaga County, New York.

We concur with the report and endorse the recommendations to mitigate for losses of fish and wildlife habitat. Our Regional Fisheries staff have recently become aware of the presence of young-of-year brown trout downstream of the project site. In order to protect these naturally reproducing fish, we particularly support the recommendation that dredging and other turbidity producing activities not take place between October 1 and ~~July~~ June 1.

Thank you for the opportunity to comment.

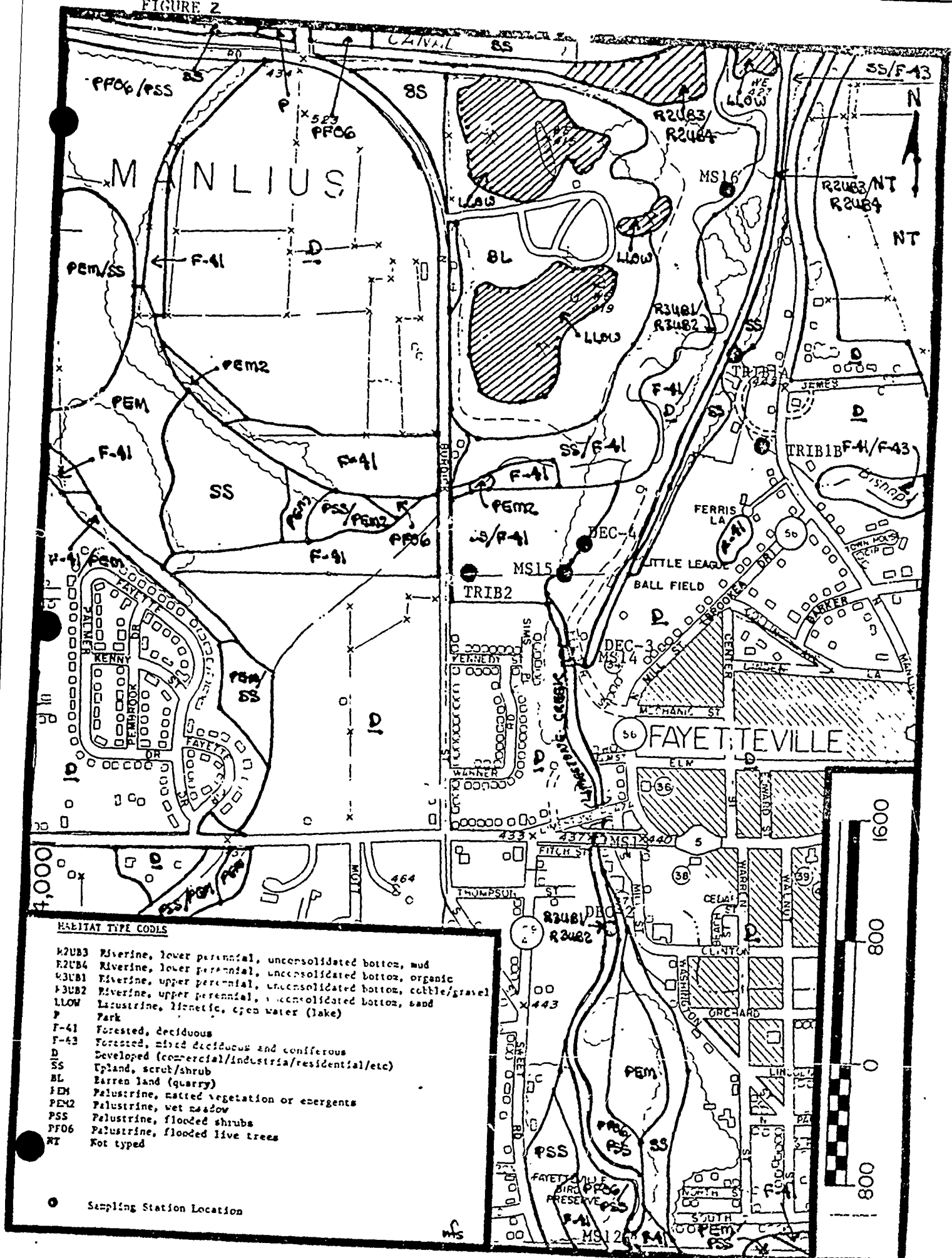
Sincerely,

Kenneth Wich

Kenneth F. Wich
Director
Division of Fish and Wildlife

cc: B. Griffin
C. Creech

FIGURE 2



HABITAT TYPE CODES

R2UB3	Riverine, lower perennial, unconsolidated bottom, mud
R2UB4	Riverine, lower perennial, unconsolidated bottom, organic
R3UB1	Riverine, upper perennial, unconsolidated bottom, cobble/gravel
R3UB2	Riverine, upper perennial, unconsolidated bottom, sand
LLOW	Lacustrine, limnetic, open water (lake)
P	Park
F-41	Forested, deciduous
F-43	Forested, mixed deciduous and coniferous
D	Developed (commercial/industria/residential/etc)
SS	Upland, scrub/shrub
BL	Barren land (quarry)
PEM	Palustrine, matted vegetation or emergents
PEM2	Palustrine, wet meadow
PSS	Palustrine, flooded shrubs
PFO6	Palustrine, flooded live trees
NT	Not typed

● Sampling Station Location

● DEC-1

TABLE 1 PAGE 1 OF 3

VEGETATION REPORTED FROM THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY - SUMMER 1982 (USFWS 1983)

SPECIES	STATION							
Terrestrial woody	MS12	MS13	MS14	MS15	MS16	T1A	T1B	T2
Basswood								
Tilia americana							X	
Butternut								
Juglans cinera							X	
Boxelder								
Acer negundo	X	X		X	X		X	X
Chokecherry								
Prunus virginiana						X	X	
Black locust								
Robinia pseudoacacia				X				
Eastern cottonwood								
Populus deltoides	X	X	X	X	X			X
Red maple								
Acer rubrum			X	X				
Sugar-maple								
Acer saccharum							X	
Willow sp.								
Salix spp.	X	X			X			
Black willow								
Salix nigra				X				
Honeysuckle sp.								
Lonicera spp.							X	
Dogwood sp.								
Cornus spp.								X
Staghorn sumac								
Rhus typhina	X			X		X		
Raspberry sp.								
Rubus spp.	X			X	X			
Multifloral rose								
Rosa multiflora				X		X		
Wild grape								
Vitis spp.			X	X	X		X	
Virginia-creeper								
Parthencissus quinquefolia				X	X	X	X	
Nightshade								
Solanum dulcamara				X				
White ash								
Fraxinus americana						X		
Terrestrial herbaceous								
Colisfoot								
Tussilago fanfara	X		X	X			X	
Grass sp.								
- - - - - - -	X	X				X	X	X
Gill-over-ground								
Glecoma hederacea							X	
Aster sp.								
Aster spp.		X		X	X	X	X	X

VEGETATION REPORTED FROM THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY - SUMMER 1982 (USFWS 1983)

SPECIES	STATION							
Terrestrial herbaceous cont.	MS12	MS13	MS14	MS15	MS16	T1A	T1B	T2
Common ragweed								
Ambrosia artemisiifolia				X	X			
Wood-sorrel								
Oxalis spp.				X				
Wild mustard sp.								
Brassica campestris				X				
Goldenrod								
Solidago spp.	X		X	X				
Violet sp.								
Viola spp.				X				
Joe-pye-weed								
Eupatorium dubium				X				
Fern sp.								
- - - - -				X	X			
Burdock								
Arctium minus				X				
Purple loosestrife								
Lythrum salicaria	X	X	X					
Cocklebur								
Xanthus spp.	X	X	X					X
Foxtail millet								
Setera glauca	X		X					
Beggars tick								
Bidens spp.	X	X	X	X	X			
Sweet clover sp.								
Melilotus spp.			X					
Barnyard grass								
Echinochloa muricata	X	X	X	X				
Sow-thistle sp.								
Sonchus spp.	X		X					X
Broadleaf plantain								
Plantago major	X							
Reed canary grass								
Phalaris arundinaceae	X	X						X
Bull thistle								
Cirsium vulgare								X
Milkweed								
Ascelepias spp.								X
Japanese bamboo								
Polygonum cuspidatum		X						
Knapweed								
Centaurea spp.	X							
Curled dock								
Romex crispus	X							
Bedstraw								
Galium spp.	X							X
Jewelweed								
Impatiens biflora					X			

TABLE 1 PAGE 3 OF 3

VEGETATION REPORTED FROM THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY - SUMMER 1982 (USFWS 1983)

SPECIES								
Terrestrial herbaceous cont.	MS12	MS13	MS14	MS15	MS16	T1A	T1B	T2
Sunflower sp. Helianthus spp.								X
Chickory Cichorium intybus								X
White snakeroot Eupatorium rugosum				X			X	
Aquatic submergents								
Cladophora Cladophora spp.	X	X						
Aquatics on damp soil above the waterline								
Giant reed Phragmites communis				X				
Smartweed sp. Polygonum spp.	X		X	X				
TOTAL SPECIES FROM A STATION	21	12	13	26	11	6	14	13

Special note; See Figure 3 for Station locations.

TABLE 2

FISH CAPTURE INFORMATION - COMBINED SPRING, SUMMER AND FALL RESULTS 1982 FOR THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY (USFWS 1983)

SPECIES: COMMON AND SCIENTIFIC NAME	STATIONS IN LIMESTONE CREEK														STATIONS IN LIMESTONE CREEK TRIBUTARIES							
	SOUTH OF FEEDER DAM						NORTH OF FEEDER DAM								On FEEDER CANAL						ON MAINSTREAM	
	MS-12		MS-13		TOTAL A		MS-14		MS-15		MS-16		TOTAL B		TOT A&B		TRIB 1A		TRIB 1B		TOT T1		TRIB 2		TOT T2	
	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE
Brown trout Salmo trutta	9	13.8	5	15.8	14	14.8	1	19.9	1	14.0	-	-	2	17.0	16	15.9	-	-	15	11.2	15	11.2	-	-	-	-
Rock bass Ambloplites rupestris	-	-	-	-	-	-	3	13.2	-	-	-	-	3	13.2	3	13.2	-	-	-	-	-	-	-	-	-	-
Pumpkinseed Lepomis gibbosus	1	8.7	-	-	1	8.7	-	-	-	-	-	-	-	-	1	8.7	-	-	-	-	-	-	-	-	-	-
Cutlips minnow Exoglossum maxillingua	9	6.7	3	5.7	12	6.2	9	6.6	9	6.4	-	-	18	6.5	30	6.4	-	-	-	-	-	-	-	-	-	-
Spottail shiner Notropis hudsonius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3.8	1	3.8	-	-	-	-
Cyprinid Notropis spp.	1	6.3	100	2.3	101	4.3	3	4.2	6	4.0	-	-	9	4.1	110	4.2	-	-	-	-	-	-	73	3.8	73	3.8
Bluntnose minnow Pimephales notatus	-	-	1	3.9	1	3.9	-	-	1	4.3	-	-	1	4.3	2	4.1	-	-	-	-	-	-	20	4.3	20	4.3
Fathead minnow Pimephales promelas	-	-	-	-	-	-	1	6.5	-	-	-	-	1	6.5	1	6.5	-	-	-	-	-	-	-	-	-	-
Finescale dace Phoxinus neogaeus	1	5.1	1	6.0	2	5.6	-	-	-	-	-	-	-	-	2	5.6	-	-	-	-	-	-	-	-	-	-
Blacknose dace Rhinichthys atratulus	6	6.4	12	4.9	18	5.7	10	5.9	14	5.8	-	-	24	5.9	42	5.8	10	5.5	15	5.5	25	5.5	11	2.9	11	2.9
Longnose dace Rhinichthys cataractae	5	6.3	3	6.1	8	6.2	7	4.9	42	6.1	-	-	49	5.5	57	5.9	-	-	-	-	-	-	-	-	-	-
Creek chub Semotilus atromaculatus	-	-	-	-	-	-	-	-	1	8.7	-	-	1	8.7	1	8.7	-	-	-	-	-	-	-	-	-	-
Fallfish Semotilus corporalis	1	8.0	-	-	1	8.0	1	5.6	1	23.0	-	-	2	16.3	3	11.2	-	-	-	-	-	-	-	-	-	-
Pearl dace Semotilus margarita	5	7.0	24	7.5	29	7.3	2	7.2	26	5.7	-	-	28	6.5	57	7.1	-	-	4	5.7	4	5.7	8	5.8	8	5.8
White sucker Catostomus commersoni	1	9.8	3	7.8	4	8.8	5	6.9	3	5.5	-	-	8	6.2	12	7.5	1	25.0	2	11.7	3	18.4	5	3.1	5	3.1
Northern hog sucker Hypentelium nigricans	3	17.7	-	-	3	17.7	1	3.8	2	11.5	-	-	3	7.7	6	12.7	-	-	-	-	-	-	-	-	-	-
Banded killifish Fundulus diaphanus	1	5.6	-	-	1	5.6	-	-	-	-	-	-	-	-	1	5.6	-	-	-	-	-	-	2	5.8	2	5.8
Fantail darter Etheostoma flabellare	3	5.5	6	4.2	9	4.9	3	3.4	6	5.1	-	-	9	4.3	18	4.6	-	-	-	-	-	-	-	-	-	-
Johnny darter Etheostoma nigrum	3	5.2	1	6.3	4	5.8	8	5.9	-	-	-	-	8	5.9	12	5.9	-	-	-	-	-	-	2	5.1	2	5.1
Channel darter Percina copelandi	-	-	-	-	-	-	4	6.0	2	5.7	-	-	6	5.9	6	5.9	-	-	-	-	-	-	-	-	-	-
Mottled sculpin Cottus bairdi	1	4.8	-	-	1	4.8	-	-	-	-	-	-	-	-	1	4.8	-	-	-	-	-	-	-	-	-	-
TOTALS	50		159		209		58		114		-		172		381		11		37		48		121		121	

Measurements are in centimeters. AVE = average length of fish in sample. See Figure 3 for Station locations.

TABLE 3

FISH CAPTURE INFORMATION - SEPTEMBER 14, 1983 BY NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION FORMATED FOR LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY. (NYSDEC 1983)

SPECIES: COMMON AND SCIENTFIC NAME	STATIONS IN LIMESTONE CREEK													
	SOUTH OF FEEDER DAM						NORTH OF FEEDER DAM						COMBINED	
	DEC-1		DEC-2		TOTAL A		DEC-3		DEC-4		TOTAL B		TOT A&B	
	#	AVE.	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE	#	AVE
Brown trout Salmo trutta	10	23.6	14	25.0	24	25.0	19	29.4	7	20.3	26	24.9	50	25.0
Rock bass Ambloplites rupestris	-	-	1	13.0	1	13.0	1	13.0	1	16.5	2	14.8	3	14.0
Pumpkinseed Lepomis gibbosus	-	-	1	10.7	1	10.7	2	11.2	-	-	2	11.2	3	11.0
Cutlips minnow Exoglossum maxillingua	11	8.0	3	8.0	14	8.0	5	7.1	2	9.3	7	8.2	21	8.1
Common carp Cyprinus carpio	-	-	-	-	-	-	1	34.3	-	-	1	34.3	1	34.3
Common shiner Notropis cornutus	2	12.2	3	10.8	5	11.5	9	8.2	2	13.1	11	10.7	16	11.1
Bluntnose minnow Pimephales notatus	-	-	-	-	-	-	-	-	2	7.5	2	7.5	2	7.5
Blacknose dace Rhinichthys atratulus	14	5.1	2	6.0	16	5.6	12	6.1	4	4.3	16	5.2	32	5.4
Longnose dace Rhinichthys cataractae	3	7.2	-	-	3	7.2	-	-	1	6.6	1	6.6	4	6.9
Creek chub Semotilus atromaculatus	1	8.4	1	9.7	2	9.1	3	8.0	2	11.6	5	9.8	7	9.5
Fallfish Semotilus corporalis	-	-	-	-	-	-	-	-	12	15.3	12	15.3	12	15.3
White sucker Catostomus commersoni	22	13.6	31	21.5	53	17.6	25	11.3	23	15.8	48	13.6	101	12.2
Northern hog sucker Hypentelium nigricans	7	13.8	1	22.1	8	18.0	6	13.4	3	14.5	9	14.0	17	16.0
Fantail darter Etheostoma flabellare	2	4.6	-	-	2	4.6	2	5.1	1	4.6	3	4.9	5	4.8
Johnny darter Etheostoma nigrum	2	3.3	-	-	2	3.3	2	3.8	2	3.8	4	3.8	6	3.6
Logperch Percina caprodes	-	-	-	-	-	-	1	7.9	-	-	1	7.9	1	7.9
Mottled sculpin Cottus bairdi	2	9.8	-	-	2	9.8	-	-	-	-	-	-	2	9.8
TOTALS	76		57		133		88		62		150		283	

Measurements are in centimeters. AVE = average length of fish in sample. See Figure 3 for Station locations.

TABLE 4

RATIO OF TROUT TO NON-TROUT FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK, FEEDER CANAL, AND TRIBUTARIES IN THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY. (Based on collections made in 1982)

REACH	RATIO
Mainstream overall within the project area	1:23
Mainstream south (upstream) of the Feeder Dam	1:13
Mainstream north (downstream) of the Feeder Dam	1:85
Feeder Canal north of the Feeder Dam	NS
Within Tributary #1 (Bishop Creek)	1:2
Within Tributary #2 (Concrete ditch)	0:121

RATIO OF GAME TO NON-GAME FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK, FEEDER CANAL, AND TRIBUTARIES IN THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY. (Based on collections made in 1982)

REACH	RATIO
Mainstream overall within the project area	1:18
Mainstream south (upstream) of the Feeder Dam	1:12
Mainstream north (downstream) of the Feeder Dam	1:33
Feeder Canal north of the Feeder Dam	NS
Within Tributary #1 (Bishop Creek)	1:2
Within Tributary #2 (Concrete ditch)	0:121

RATIO OF TROUT TO NON-TROUT FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK IN THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY. (Based on collections made in 1983)

REACH	RATIO
Mainstream overall within the project area	1:5
Mainstream south (upstream) of the Feeder Dam	1:5
Mainstream north (downstream) of the Feeder Dam	1:5

RATIO OF GAME TO NON-GAME FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK IN THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY. (Based on collections made in 1983)

REACH	RATIO
Mainstream overall within the project area	1:4
Mainstream south (upstream) of the Feeder Dam	1:4
Mainstream north (downstream) of the Feeder Dam	1:4

Note: NS indicates the reach was not sampled.

TABLE 5

COMBINED 1982 AND 1983 RATIOS OF TROUT TO NON-TROUT FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK IN THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NEW YORK.

REACH	RATIO
Mainstream overall within the project area	1:14
Mainstream south (upstream) of the Feeder Dam	1:9
Mainstream north (downstream) of the Feeder Dam	1:45

COMBINED 1982 AND 1983 RATIOS OF GAME TO NON-GAME FISH SPECIES FOR VARIOUS REACHES OF LIMESTONE CREEK IN THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NEW YORK.

REACH	RATIO
Mainstream overall within the project area	1:11
Mainstream south (upstream) of the Feeder Dam	1:8
Mainstream north (downstream) of the Feeder Dam	1:14

TABLE 6 PAGE 1 OF 2

INVERTEBRATES FROM THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY SUMMER OF 1982 (USFWS 1983)

SPECIES: COMMON AND SCEINTIFIC NAME	STATION							
	MS12	MS13	MS14	MS15	MS16	T1A	T1B	T2
Flatworm Dugesia tigrina	-	-	-	1	NS	NS	-	-
Aquatic earthworm - - - - - - - - - -	-	-	1	4	NS	NS	3	-
Aquatic earthworm Aeolosoma	-	-	1	-	NS	NS	-	-
Aquatic sowbug Asellus spp.	-	-	-	-	NS	NS	-	1
Scud Gammarus spp.	2	4	3	13	NS	NS	56	2
Crayfish Cambarus bartoni robustrus	-	1	-	-	NS	NS	1	1
Stonefly - - - -	-	-	-	-	NS	NS	4	-
Mayfly Baetis	-	2	-	-	NS	NS	-	-
Mayfly Heptagenia	1	4	-	-	NS	NS	-	-
Mayfly Ephemera	1	-	-	-	NS	NS	-	-
Mayfly Paraleplophlebia	1	8	-	-	NS	NS	-	-
Mayfly - - -	22	-	1	-	NS	NS	5	-
Water strider Gerris spp.	-	-	-	-	NS	NS	1	4
Water boatman - - - - - - - -	-	-	-	-	NS	NS	1	1
Caddisfly Hydropsyche	12	-	-	-	NS	NS	-	-
Caddisfly Rhyacophilia	1	-	-	-	NS	NS	-	-
Caddisfly Diplectrona	1	-	-	-	NS	NS	-	-
Caddisfly Limnephilis	-	-	-	-	NS	NS	-	1
Caddisfly - - - - -	-	-	2	-	NS	NS	5	-
Whirligig beetle Gyrinus spp.	1	-	-	-	NS	NS	6	-
Elmid Narpus	-	-	-	-	NS	NS	-	1
Elmid Stenelmis	1	1	-	-	NS	NS	-	-
Non-aquatic beetle - - - - - - - - -	-	-	-	-	NS	NS	-	1

INVERTEBRATES FROM THE AREA AFFECTED BY THE LIMESTONE CREEK FLOOD CONTROL PROJECT AT FAYETTEVILLE, NY SUMMER OF 1982 (USFWS 1983)

SPECIES: COMMON AND SCEINTIFIC NAME	STATION							
	MS12	MS13	MS14	MS15	MS16	T1A	T1B	T2
Blackfly larvae *Simulium spp.*	4	1	4	-	NS	NS	-	-
Blackfly pupae *Simulium spp.*	-	1	-	-	NS	NS	-	-
Midge larvae - - - - - -	31	29	19	9	NS	NS	31	146
Midge pupae - - - - - -	-	-	-	-	NS	NS	1	-
Anthomyiid *Limnophora aequifrons*	-	-	-	-	NS	NS	-	1
Terrestrial fly - - - - - - - -	1	-	-	-	NS	NS	-	-
Pouch snail *Gyraulus*	-	-	1	-	NS	NS	-	1
Pouch snail *Physa*	-	-	-	-	NS	NS	-	1
Egg mass - - - - -	-	-	-	-	NS	NS	-	1
TOTALS	79	51	32	27			114	152

NS indicates that no sample was taken at the station. See Figure 3 for Station locations.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
100 Grange Place
Room 202
Cortland, New York 13045

February 16, 1984

Colonel Robert R. Hardiman
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara St.
Buffalo, NY 14207

Dear Colonel Hardiman:

This responds to a February 16, 1984, telephone request (Frapwell/Gill) for informal consultation with regard to threatened or endangered species which may be found in the vicinity of Limestone Creek, Fayetteville Flood Control project, located in Onondaga County, NY.

Except for occasional transient species, no federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act is required with the U.S. Fish and Wildlife Service. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of endangered and threatened species in New York is enclosed for your information.

This response relates only to endangered species under our jurisdiction. It does not address other FWS concerns under the Fish and Wildlife Coordination Act or other legislation.

Thank you for your interest in endangered species. Please contact us if we can be of further assistance.

Sincerely,

William H. Gill

William H. Gill
Acting Field Supervisor

Enclosure

United States Department of the Interior
FISH AND WILDLIFE SERVICE
100 Grange Place
Room 202
Cortland, New York 13045

MAILROOM
CENED-H-S
17 Sep 90 12 16

September 12, 1990

Colonel John W. Morris
District Engineer, Buffalo District
U. S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Attention: Leonard Bryniarski

Dear Colonel Morris:

This responds to your September 5, 1990 request for an extension of the July 1 thru October 1 window for in-water work in conjunction with the proposed Section 205 Flood Control Project on Limestone Creek in Fayetteville, New York.

This amends our July 2, 1984 Fish and Wildlife Coordination Act report.

As previously noted, Limestone Creek supports a naturally reproducing salmonid population and is listed by the New York State Department of Environmental Conservation (State) among the top 50 trout streams in New York. After discussion with the State, it was determined that the window can be extended to June 1 thru October 1. This extension will have a minor adverse impact upon the creek. An extension beyond October 1 is not possible without the risk of significant adverse impact to the indigenous salmonid population.

Please advise us of action taken pursuant to our recommendations or changes in the proposal. For further information, contact Michael Stoll at 607-753-9334.

Sincerely,
William H. Gill
ACTING FOR
Leonard P. Corin
Field Supervisor

cc: NYSDEC, Albany, NY
NYSDEC, Cortland, NY
EPA, Chief, Marine & Wetlands Protection Branch, New York, NY

ENV. APPEN. C - SECTION 404(b)(1) PUBLIC NOTICE
AND EVALUATION REPORT

LIMESTONE CREEK - FAYETTEVILLE, NEW YORK
SECTION 404 PUBLIC NOTICE AND EVALUATION
REPORT ADDENDUM

Since coordination of the Draft Environmental Impact Statement, some project design changes have occurred. Although the project plan is essentially the same, the size of the levees and the associated amount of riprap stone required has increased. The amount of fill material to be placed below the normal high water mark (US waters) is now approximately 3,247 cubic yards of impervious fill material, 2,276 cubic yards of bedding stone, and 11,292 cubic yards of riprap stone. Except for the increased quantities, previous report statements still pertain.

Revised 7/90

U.S. Army Corps of Engineers
Buffalo District

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

PUBLIC NOTICE

LIMESTONE CREEK
FLOOD DAMAGE REDUCTION PROJECT
AT
FAYETTEVILLE, NY

This Public Notice is being distributed to identify what dredged or fill material would be discharged into waters of the United States by implementation of the project proposed by the Section 205 Flood Control Project for Limestone Creek at Fayetteville, NY. The selected plan consists primarily of providing 100-year levee and floodwall flood protection to the community developments (Reference Figure 1). There would also be some clearing, snagging, and installation of stone riprap. On the west side of the creek, stone riprap would be placed along about 3,500 linear feet of newly constructed levee slope facing the creek. On the east side of the creek, stone riprap would be placed for about 800 linear feet along the proposed floodwall and for about 400 linear feet along the small berm. Additionally, some stone riprap would also be placed along the creek banks just downstream of the feeder canal dam. The stone bedding fill placed below the ordinary high water mark would consist of approximately 1,700 cubic yards of crushed limestone or gravel placed 6 inches thick along the levee toe facing the creek; upon which would be placed a 12-inch thick layer of heavier large sized riprap limestone fill (totaling about 3,450 cubic yards in volume). This stone bedding and riprap would cover a surface area of approximately 86,400 square feet (2.0 acres). All stone and gravel would be obtained from a local quarry. Riprap to be used would be clean and free of significant cracks, seams, and overburden material.

A Section 404 Evaluation Report is included with this Public Notice which only evaluates the proposed impacts of the deposition of the aforementioned materials into Limestone Creek.

This project is being reviewed under the following applicable laws:

a. National Environmental Policy Act, as amended, 42 USC 4321, et. seq.

b. Clean Air Act, as amended, 42 USC 7401, et. seq.

c. Clean Water Act, as amended, (Federal Water Pollution Control Act), 33 USC 1251, et seq.

d. Watershed Protection and Flood Prevention Act, 16 USC 1001, et. seq.

e. Fish and Wildlife Coordination Act, as amended, USC 661, et. seq.

f. Endangered Species Act, as amended, 16 USC 1531, et. seq.

g. Land and Water Conservation Fund Act, as amended, 16 USC 4601-11, et. seq.

h. Federal Water Project Recreation Act, as amended, 16 USC 460-1(12), et. seq.

i. Archeological and Historic Preservation Act, as amended, 16 USC 469, et. seq.

j. National Historic Preservation Act, as amended, 16 USC 470a, et. seq.

The proposed disposal method would involve use of heavy construction equipment to place riprap and bedding stone. Work would be performed with dump trucks (to haul stone to the project site from the quarry); a bulldozer or grader (to excavate and grade the bank slope for placement of stone), and a backhoe or front end loader (to haul stone from the dump site and place it at the desired location on the bank slope).

Steps to minimize potential adverse impacts on the discharge of stone fill into the aquatic system include: (1) Scheduling construction work as much as possible to coincide with the late summer low-flow period in the creek in order to avoid adverse impacts on spring fish spawning and to minimize impact on newly hatched game and nongame fish; (2) Prompt revegetation of disturbed bank soils with adaptable grass, legume, shrub or tree species to help reduce soil erosion as well as siltation into the creek and (3) The Contractor would be required to comply with the Corps of Engineers Civil Works Construction Guide Specification entitled "Environmental Protection" (CW-01430 dated July 1978). Even though there may be a possibility of some unavoidable minor amount of fuel oil or grease spillage into the water during normal operation of heavy equipment, a Corps inspector would monitor construction activities, in order to help prevent adverse significant spillage of such material into the aquatic ecosystem.

This area where the placement of the materials will occur has not been previously designated by the Administrator of the U.S. Environmental Protection Agency (USEPA) as a disposal site.

The New York State Department of Environmental Conservation (NYSDEC), in a letter dated 6 August 1979 (on file at the Buffalo District Office) has stated that when they are the local cooperator on a flood control project, the requirement for the Buffalo District to obtain a 401 Water Quality Permit is waived. NYSDEC is the local cooperator on the Limestone Creek flood damage reduction project.

The latest published version of the National Register of Historic Places has been consulted. There are no registered properties or properties listed as being eligible for inclusion therein that will be affected by this project. As per information obtained through a cultural resources reconnaissance survey performed in May 1983 and subsequent coordination thereof; no significant cultural resources should be affected by the proposed project. By this notice, the National Parks Service is advised that presently unknown archeological, scientific, prehistorical, or historical data may be lost or destroyed by work to be accomplished under this project.

This Section 404 Public Notice and Evaluation Report is being distributed to local, State, and Federal interests as part of the Draft Detailed Project Report, Draft Environmental Impact Statement, and Appendices entitled: Limestone Creek, Fayetteville, NY.

The Buffalo District Engineer must evaluate the impacts of the discharge of dredged or fill material into the waters or wetlands of the United States, as promulgated by the Administrator of the USEPA using Section 404(b)(1) Guidelines of the Clean Water Act (40 CFR 230). Therefore, any person who has an interest which might be affected by the proposed discharges may request a public hearing. The request must be submitted in writing to the District Commander within 30 days of the date of this notice and, must clearly state the interest which may be affected and the manner in which the interest may be affected by this activity. A lack of response will be interpreted as meaning that there is no objection to the proposed work.

Correspondence pertaining to this matter should be addressed to the District Commander, U. S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, NY 14207, ATTN: Mr. Tod Smith. If you have any questions or require additional information, please contact Mr. Tod Smith of my Environmental Analysis Branch at 716-876-5454, extension 2173 or FTS 473-2173.

Sincerely,

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

1 Enclosure
as stated

NOTICE TO POSTMASTER: It is requested that the above notice be conspicously displayed for 30 days from the date of issuance.

The following agencies, groups, and individuals will be sent copies of the Public Notice and Preliminary Section 404 Evaluation:

Congressional

U.S. Senator - Alphonse D'Amato
U.S. Senator - David P. Moynihan
U.S. Representative - George Wortley

Federal

Advisory Council on Historic Preservation
Department of Agriculture
Forest Service
Soil Conservation Service
Department of Commerce
Department of Defense
Department of Energy
Environmental Protection Agency
Federal Emergency Management Administration
Department of Health and Human Services
Department of Housing and Urban Development
Department of the Interior
Department of Transportation

State

Office of the Governor
New York State Clearinghouse
New York State Department of Agriculture and Markets
New York State Department of Commerce
New York State Department of Environmental Conservation
New York State Department of Health
New York State Department of State
New York State Department of Transportation
New York State Office of Parks, Recreation, and Historic Preservation
New York State Office of Planning Services
Office of the State Archeologist

Regional and Local

Central New York Regional Planning and Development Board (A-95)
Onondaga County (Agencies)
Town of Manlius
Village of Manlius
Village of Fayetteville
Trout Unlimited
Other Regional Environmental Groups

Other Organizations and Individuals.

Individuals are not listed. A complete mailing list is on file at the U.S. Army Corps of Engineers, Buffalo District Office.

Limestone Creek, Fayetteville

Note: All structures are shown at proposed location. Final alignment is not yet established.

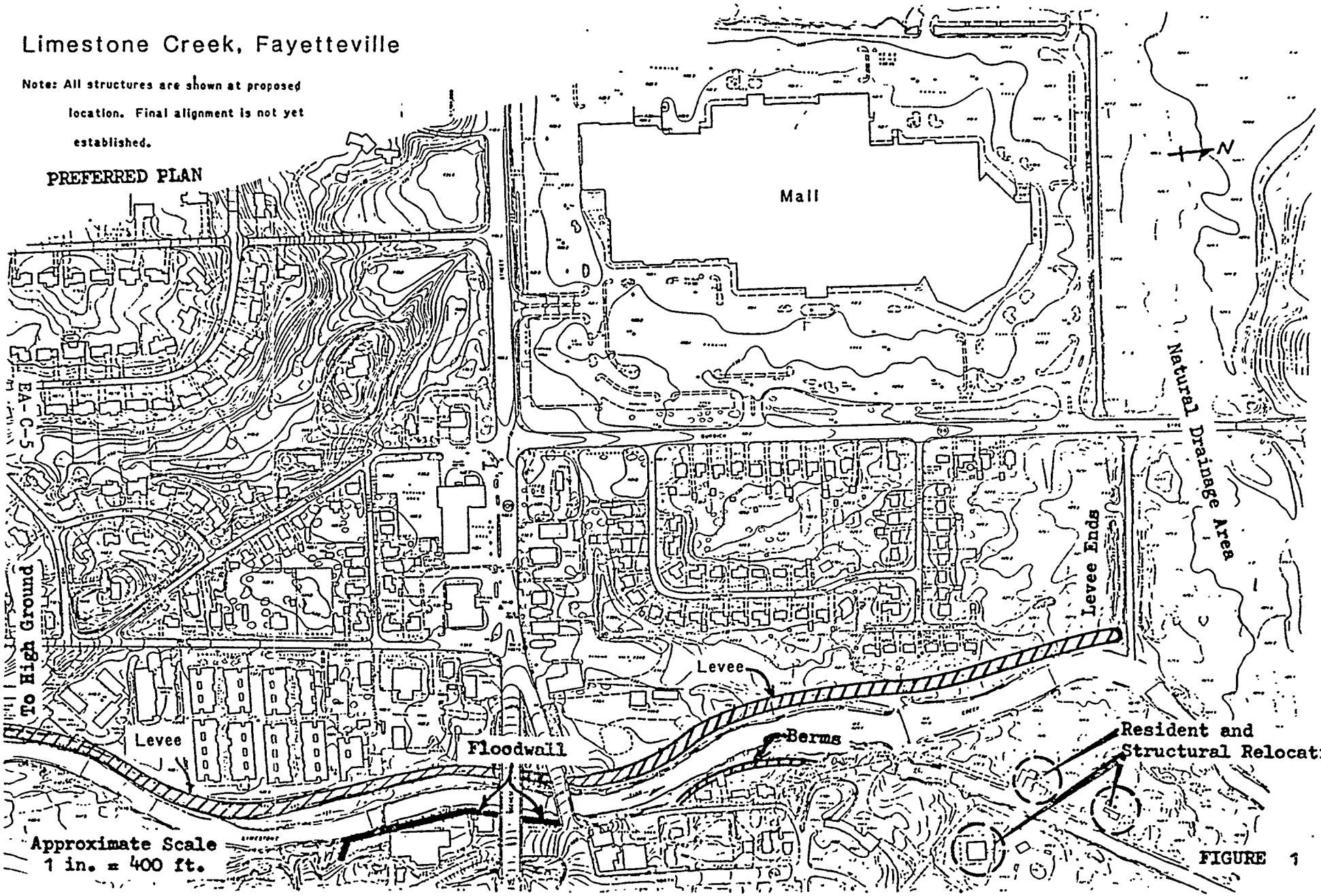


FIGURE 1

SECTION 404(b)(1) EVALUATION
FOR
FLOOD DAMAGE REDUCTION
AT
LIMESTONE CREEK, FAYETTEVILLE, NY

1. PROJECT DESCRIPTION

1.1 Introduction. Section 404 Discharges - Section 404 of the Clean Water Act (33 United States Code 1344) requires the evaluation of water quality effects of disposal of dredged or fill materials into navigable waters of the United States. This evaluation for Limestone Creek at Fayetteville, NY (in Onondaga County), has been prepared using general guidance contained in ER 1105-2-50, Chapter 4, dated 29 January 1982, and its associated Appendix F entitled "Recommended Outline for Section 404(b)(1) Evaluation using 24 December 1980 Guidelines (40 CFR 230)." In conformance with guidance contained in NCDPD-ER letter dated 4 September 1979 on "Public Coordination of Section 404(b)(1) Evaluations", this evaluation is being coordinated with the public. The 4 September 1979 letter states that a Public Notice, with an attached Section 404(b)(1) Evaluation should be issued at the earliest possible date.

1.1.1 This evaluation is only concerned with the stone riprap fill material that would be placed into Limestone Creek to provide erosion protection, below the Creek's ordinary high water mark. Although some steel sheet pile capped with concrete would also be installed to construct a floodwall, the floodwall would be installed above the ordinary high water line of the creek, and therefore, would not qualify for Section 404(b)(1) Evaluation. Additionally, steel sheet piling is not considered to be fill material.

1.2 Location and General Description. The proposed project site is located on Limestone Creek in the village of Fayetteville, NY, approximately 7 miles southeast of the city of Syracuse. From the Genesee Street Bridge in Fayetteville, the project site extends about .4 of a mile northward and approximately .3 of a mile southward in the village.

1.2.1 The selected plan consists primarily of providing 100-year levee and floodwall flood protection to the community developments (Reference Figure 1). There would also be some clearing, snagging, and installation of stone riprap. On the west side of the creek, stone riprap would be placed along about 3,500 linear feet of newly constructed levee slope facing the creek. On the east side of the creek, stone riprap would be placed for about 800 linear feet along the proposed floodwall and for about 400 linear feet along the small berm. Additionally, some stone riprap would also be placed along the creek banks just downstream of the feeder canal dam.

1.3 Authority and Purpose. Authorization for this flood reduction study on Limestone Creek in Fayetteville, NY, is provided under the authority of Section 205 of the 1948 Flood Control Act, as amended. An investigation to determine the applicability of Section 205 was initiated in response to a letter dated 23 October 1980 from James H. Lannon, Mayor, Village of Fayetteville, NY, for the purpose of having the Corps of Engineers conduct a

study of areas within the village that are periodically subject to flooding from Limestone Creek. The Reconnaissance Report was prepared and approved in May 1981.

1.4 General Description of Dredged or Fill Material. The stone bedding fill placed below the ordinary high water mark would consist of approximately 1,700 cubic yards of crushed limestone or gravel placed 6 inches thick along the levee toe facing the creek; upon which would be placed a 12-inch thick layer of heavier large sized riprap limestone fill (totaling about 3,450 cubic yards in volume). This stone bedding and riprap would cover a surface area of approximately 9,600 square yards (2.0 acres). All stone and gravel would be obtained from a local quarry. Riprap to be used would be clean and free of signficant cracks, seams and overburden material.

1.5 Description of the Proposed Disposal Site. The main creek channel consists of an interspersion of riffles and pool zones, with a fast current flowing over a diverse rocky substrate. Both creek banks are well vegetated with trees, shrubs, grasses and forbs. Terrestrial riparian vegetation along the creek banks is well established despite residential and commercial development that has occurred along portions of the creek. Typically, the riparian vegetation includes such plants as black willow, boxelder, eastern cottonwood, staghorn sumac, some sugar maple, raspberry, wild grape, goldenrod, sweet clover, foxtail millet, and grasses. In general, aquatic plant growth is sparse consisting mostly of some smartweed and submerged cladophora algae.

1.6 Description of the Disposal Method. The proposed disposal method would involve use of heavy construction equipment to place riprap and bedding stone. Work would be performed with dump trucks (to haul stone to the project site from the quarry); a bulldozer or grader (to excavate and grade the bank slopes for placement of stone), and a backhoe or front end loader (to haul stone from the dump site and place it at the desired location on the bank slope).

2. FACTUAL DETERMINATIONS

2.1 Physical Substrate Determinations. Bedding stone and riprap, to be deposited along the creek bank below the ordinary high waterline, would be installed to protect bank soils where soil erosion could occur from scouring. There would be a change in surface substrate type from what presently exists as a more unstable cobble, gravel, and silt mixture, to a more stable, heavier stone surface cover on the bank slope and toe of the bank slope. The Onondaga County Soil Survey Report identifies the riparian creek bank areas as primarily composed of silt loam. Placement of stone fill over the silt loam will cover this finer soil type with a heavy rougher stone surface, and the existing contour elevation of the creek bank slopes and narrow portion of channel bottom along the bank toe would change to some degree. The elevation change would be minor. Placement of heavy limestone riprap into the excavated toe trench of the channel bed at the base of riprapped bank slopes, would provide a rough substrate to replace some of the existing stone substrate that was excavated from the channel bed.

2.2 Water Circulation, Fluctuation, and Salinity Determinations. No significant change in water level, velocity, or current pattern is expected by placement of the riprap and bedding stone. There would be a change in water depth within the channel during flooding periods, since water would be confined to the channel by bank levees during these periods; therefore, water depths would be deeper than under normal low flow conditions. Removal of existing riparian vegetation and replacement with riprap stone would change current patterns to some degree along the shoreline, but no singificant measurable change in such patterns is anticipated. Under existing riparian vegetation conditions along the creek banks, there is probably more friction than would occur with riprap stone. Removal of vegetation and replacement with riprap may cause a slight temporary increase in water velocity along the shoreline of the riprap during storm periods when the water level is higher. No significant adverse impact on water salinity, water chemistry or odor would occur.

2.3 Suspended Particulate/Turbidity Determinations. Some unavoidable temporary water turbidity and particulate resuspension in the creek would unavoidably occur from disturbance of channel substrate and bank soil during installation of the stone fill material. Also, a minor amount of oil, grease and fuel leakage may occur in the channel during normal operation of heavy equipment that would contribute to some short-term turbidity. However, precautions and on-site monitoring to prevent or minimize accidental spillage of such material would be taken. The Contractor will be required to minimize suspended particulates and turbidity by following the Corps Construction Guide Specifications for Environmental Protection (CW-01430 dated July 1978). Also, discharge of stone fill would be timed to coincide with low flow conditions in the creek as much as possible in order to lessen impact on benthic organisms and fish.

2.4 Contaminant Determinations. The term "contaminant" is defined by U. S. EPA Guidelines 40 CFR 230.3(e) as a "chemical or biological substance in a form that can be incorporated into, onto, or be ingested by and that harms aquatic organisms, consumers of aquatic organisms, or users of the aquatic environment, and includes but is not limited to the substances on the 307(a)(1) list of toxic pollutants promulgated on 32 January 1978 (43 Federal Register 4109)."

2.4.1 Quarrystone (limestone) used for bedding and riprap is considered to be basically inert fill material, and appears to meet exclusion criteria for testing the chemical-biological interactive effects outlined in 40 Code of Federal Regulations 230.4-(b),(2), and (3) no further testing on this material will be conducted. Such materials may be excluded from the aforementioned testing if any of the exclusion criteria defined in 40 CFR 230.4(b)(i),(ii), or (iii) are met. Briefly stated, these exclusion criteria are: (i) that the fill material is composed predominantly of sand, gravel or other naturally occurring sedimentary material with particle sizes larger than silt, usually found in high energy environments; (ii) that the material proposed for discharge is primarily the same as at the discharge site. This final criterion requires that the fill material is sufficiently removed from sources of pollution to provide reasonable assurances that the material is not polluted from such sources, and that adequate conditions are

provided on the placement method, to provide reasonable assurance that the discharged material will not be moved by currents or otherwise in a manner that is damaging to the environment outside the disposal area. Stone to be used as fill on the Fayetteville project would predominantly consist of sedimentary rock material that is unpolluted, which would be obtained from a local quarry.

2.5 Aquatic Ecosystem and Organism Determinations. Fill placed into the Limestone Creek channel will destroy, displace, or disrupt some aquatic organisms in the construction project zone - primarily invertebrate benthic organisms and fish. Existing benthic invertebrates would be destroyed and/or displaced during bank slope grading and placement of stone; fish and fish habitat would be disrupted at the riprap sites. Some existing invertebrates would be destroyed by being covered with heavy stone, and some would be smothered as silt resuspended and then resettled over their benthic habitat. Some of these organisms as well as fish would be displaced to other streambed areas nearby or further downstream. Turbidity during construction may temporarily aggravate gill breathing systems of fish and drive them out of the construction zone until work was finished and water and substrate conditions in the project area restabilized. Temporary water turbidity during construction would probably cause some short-term reduction in photosynthetic activity of submerged aquatic plants (primarily algae), also some of these plants may be uprooted during grading of bank slopes. Stone fill placed into the creek channel - primarily stone that would be inundated extensively - would provide some new benthic organism, fish and algal habitat for recolonization. The stone fill material would probably soon be recolonized with aquatic invertebrate organisms that survived in the construction zone, or that reinvaded the new habitat by floating into the project zone from upstream areas. The rough surface area and interstices created among the submerged riprap stones would provide some new cover and feeding habitat for fish. Some algae would also reestablish onto the limestone substrate. In order to help minimize or avoid adverse impact on aquatic life (i.e., fish spawning, newly hatched fry) in the creek, construction work would be performed during the late summer and/or fall low-flow periods as much as possible. No significant adverse impact on riffle and pool areas is expected to occur since construction work would mostly occur above water on the channel bank, and will be confined to a very narrow portion of the shoreline.

2.5.1 There are no known commercial freshwater shellfish reported within the project area; therefore, no significant adverse impact on this resource is anticipated.

2.5.2 No wetlands would be significantly adversely impacted by installation of the stone fill material.

2.5.3 No threatened or Endangered Species would be significantly adversely impacted by installation of the stone fill material. Riparian vegetation along the proposed riprap alignment would be eliminated as habitat for terrestrial wildlilfe. Some native plants would eventually reinvade soils that accumulated among the stone riprap interstices.

2.6 Proposed Disposal Site Determinations. Since all or most of the construction work would occur during the late summer or fall seasons, the mixing zone would be confined to a narrow shallower area of the creek shoreline. As previously indicated, the limestone fill to be used is basically inert and would be unpolluted, and is not expected to contribute to significant adverse reduction in water quality. Some temporary water turbidity during bank slope grading and stone placement would be unavoidable, but the quarry limestone would not itself contribute significant silt and sediment to the creek water.

2.6.1 With regard to Water Quality Certification, as stated in the New York State Department of Environmental Conservation (NYSDEC) letter, dated 6 August 1979 (on file at the Buffalo District Office), whenever NYSDEC is a local cooperator on flood control projects, they waive the necessity for requiring a Section 401 Water Quality Permit. NYSDEC is a local cooperator on this proposed project and, therefore, a Water Quality Certificate is not required.

2.6.2 There are no municipal water intakes within the fill disposal site or immediately downstream; therefore, no significant adverse impact is anticipated in this regard.

2.6.3 Some temporary adverse impact on shoreline fishing recreation is expected until construction ceased and water turbidity dissipated. Construction work and construction generated dust and noise would tend to temporarily discourage fishermen from actively fishing in the project zone until heavy equipment was removed from the project site and water turbidity dissipated.

2.6.4 No parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites and similar preserves would be significantly adversely impacted.

2.7 Determination of Cumulative Effects On the Aquatic Ecosystem. Installation of stone riprap along the banks of Limestone Creek in Fayetteville would further reduce the amount of riparian vegetation and may slightly raise water temperature along the creek (riprap is also proposed on the banks of this creek in the village of Manlius located about 4 miles upstream on another flood control project). However, a slight rise in water temperature on this coldwater creek may not be very adverse during the summer low flow period, since the creek contains a continuous water flow as well as some scattered deeper pools. Also, water replacement through the project from upstream cooler shaded areas appears to be fairly rapid. Addition of riprap in Fayetteville would contribute toward some long-term further reduction of soil erosion and run-off of silt into the creek. Placement of stone fill riprap would take about one construction season to complete. Minor repair of the riprap may be required as needed at some future date, which could result in addition of more stone to maintain the project. If such repair was needed, similar type stone fill material would be used. Except for some short-term turbidity, disturbance of some bottom substrate, as well as minor disruption of benthic habitat (confined mostly to the creek shoreline along the west bank); no significant cumulative adverse impact on water quality and aquatic life is anticipated.

2.8 Determinations of Secondary Effects on the Aquatic Ecosystem. The immediate effects of stone bedding and riprap installation would be to destroy about 2 acres of riparian vegetation and aquatic shoreline (primarily along the west bank). The secondary impacts would be: temporary water turbidity; temporary disruption to fish, benthic organisms and wildlife; creation of some stable new submerged rough surface aquatic substrate for recolonization by aquatic organisms; reduction of shade over a portion of the creek (mostly along the west bank); and reduction of woody and herbaceous terrestrial wildlife habitat for small game and nongame wildlife. To some degree, the interstices among the large riprap stones will provide some cover habitat for small mammals and reptiles. Additionally, soil protection provided by the riprap will reduce bank slope erosion and siltation into the creek over the long-run.

3. FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

3.1 Adaptation of the Section 404(b)(1) Guidelines to this Evaluation. No significant adaptations of the Section 404(b)(1) Guidelines were made relative to this evaluation.

3.2 Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site which would have Less Adverse Impact on the Ecosystem. In addition to the selected project referred to as "Plan 1 - Levees/Floodwalls" which includes the stone bedding and riprap installation described in this Section 404(b)(1) Evaluation, "No-Action" as well as four additional alternatives were considered. Two were entirely structural, one contained structural as well as nonstructural measures, and one alternative was entirely nonstructural. Plan 2 - Channelization/Levees and Plan 3 - Channelization would have significantly adversely impacted aquatic habitat for benthic organisms and fish as well as the organisms themselves. Plan 4 - Levee and Nonstructural Measures (consisting of flood proofing and permanent evacuation) would have had less adverse environmental impact on the aquatic and riparian environment than Plans 2 and 3, but would not have provided structural protection to downstream residents. Plan 5 - Nonstructural, consisting of floodproofing, evacuation, and flood warning would have had less adverse impact on the aquatic ecosystem than the selected plan, but it did not satisfy the planning objectives. Therefore, Alternative Plans 2 through 5 were eliminated from further consideration.

3.3 Compliance with Applicable State Water Quality Standards and Toxic Effluent Standards or Prohibition under Section 307 of the Clean Water Act. The proposed placement of stone fill material into Limestone Creek at Fayetteville would not violate any applicable State Water Quality Standards with the exception of temporary turbidity. With regard to Water Quality Certification, as previously mentioned, when NYSDEC is the local cooperator on a flood control project, the need for Water Quality Certification is waived (as indicated in NYSDEC letter dated 6 August 1979 on file at the Buffalo District Corps Office). Since NYSDEC is a cooperator on this project, no Water Quality Certification is required. Installation of the stone fill will not violate the toxic Effluent Standards of Section 307 of the Clean Water Act.

3.4 Compliance with the Endangered Species Act of 1973. Recent communication with the U. S. Fish and Wildlife Service and the New York State Department of Environmental Conservation indicated that the placement of stone fill material into the Limestone Creek channel (primarily along the west bank slope) will not harm any threatened or endangered species or their critical habitat.

3.5 Evaluation of Extent of Degradation of the Waters of the United States. Installation of the stone fill into the Limestone Creek channel (primarily along the west bank slope) will not result in significant adverse effects on human health and welfare, municipal and private water supplies, shellfish, plankton, fish, wildlife, and recreation or commercial fishing. Shoreline fishing for cold-water species in the immediate project vicinity would be temporarily disrupted by water turbidity and work activity. Bank slope grading and placement of the stone would unavoidably destroy, disturb or displace some benthic invertebrates, fish, and plants, but no significant long-term adverse impacts on life stages of aquatic life, aquatic system diversity, productivity, stability, and special aquatic sites would be anticipated to occur. Waterfowl would temporarily tend to be discouraged from utilizing aquatic habitat at the project site as a resting or feeding area until construction ceased. With regard to aesthetics, disruption of substrate during construction would cause a temporary increase in water color, probably making water appear more brown in color as viewed from the creek banks or any of the bridges crossing over the creek in the project vicinity. Additionally, once riprap is placed, the creek bank slope in the project zone will have a more open "man-made" appearance, in contrast to the variety of natural vegetation that formerly was interspersed along much of the bank.

3.6 Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem. Steps taken to minimize potential adverse impacts on the discharge of stone fill into the aquatic system include: (1) scheduling construction work as much as possible to coincide with the late summer low-flow period in the creek in order to avoid adverse impacts on spring fish spawning and to minimize impact on newly hatched game and nongame fish; (2) prompt revegetation of disturbed bank soils with adaptable grass, legume, shrub or tree species to help reduce soil erosion as well as siltation into the creek, and (3) the Contractor would be required to comply with the Corps of Engineers Civil Works Construction Guide Specification entitled "Environmental Protection" (CW-01430 dated July 1978). Even though there may be a possibility of some unavoidable minor amount of fuel oil or grease spillage into the water during normal operation of heavy equipment, a Corps inspector would monitor construction activities, in order to help prevent adverse significant spillage of such material into the aquatic ecosystem.

3.7 On the Basis of the Guidelines, the Proposed Disposal Sites for the Discharge of Dredged or Fill Material is: Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

Robert R. Hardiman

ROBERT R. HARDIMAN
Colonel, Corps of Engineers
District Commander

FAYETTEVILLE, NEW YORK

ENV. APPEN. D - LETTER FROM SHPO

U.S. Army Corps of Engineers
Buffalo District

TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE: Oct. 4, 1983

SUBJECT OF CONVERSATION: Limestone Creek, Fayetteville - Cultural Resources Recon.

INCOMING CALL

PERSON CALLING	ADDRESS	PHONE NUMBER AND EXTENSION
Chuck Florence	N.Y.S. Historic Preservation Ofc., Albany	(518)-474-3176
PERSON CALLED	**OFFICE**	**PHONE NUMBER AND EXTENSION**
Tim Daly	NCBPD-ER	(716)-876-5454 ext. 2175

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	**ADDRESS**	**PHONE NUMBER AND EXTENSION**

SUMMARY OF CONVERSATION

Mr. Florence called in lieu of sending a response letter to state for the record that the NYSHPO is in agreement with the conclusions of the July 1983 Cultural Resources Survey for Limestone Creek, Fayetteville, N.Y., and that no further cultural resources investigations are recommended.

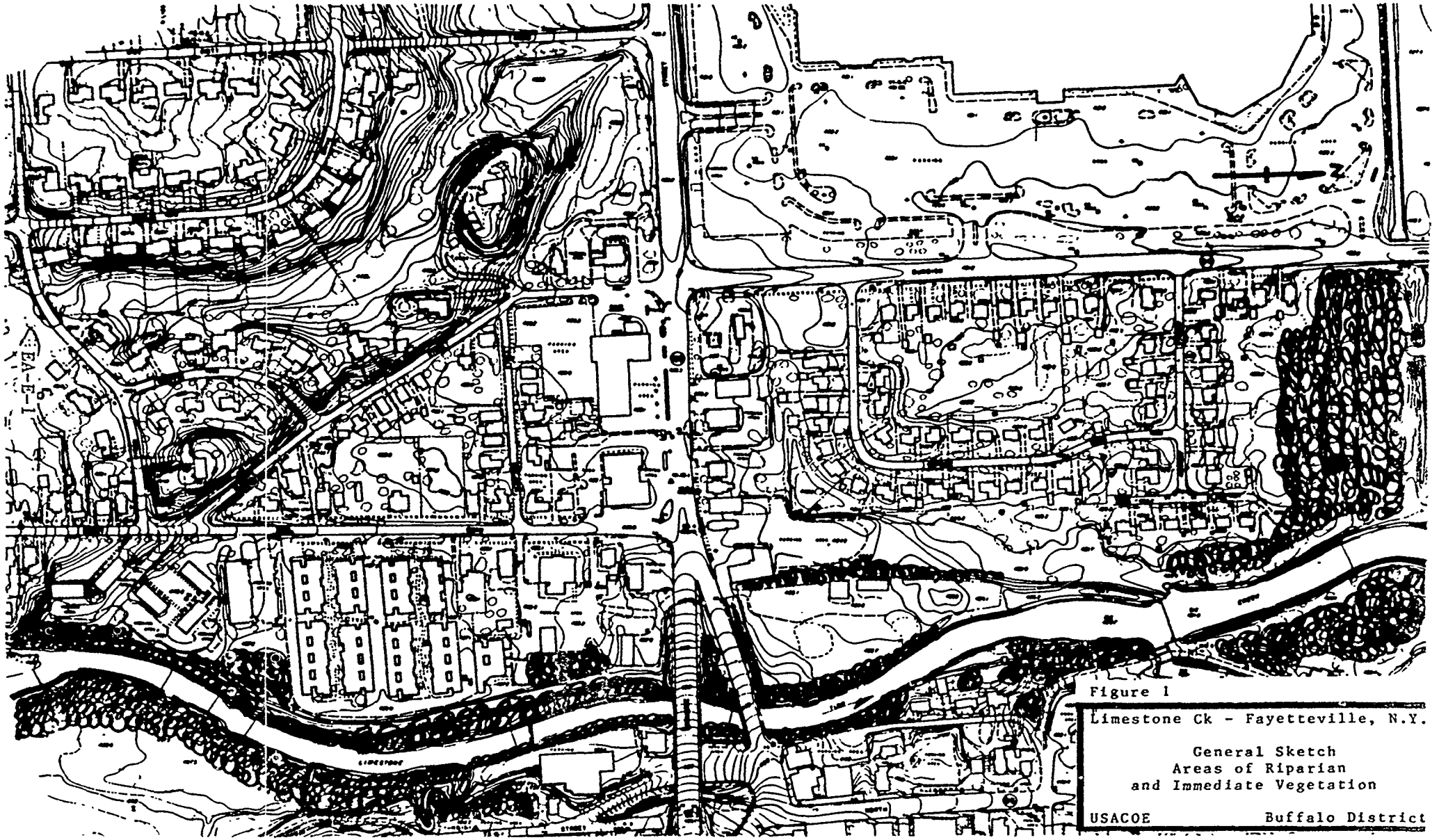
DA FORM 751

FAYETTEVILLE, NEW YORK

ENV. APPEN. E - ENVIRONMENTAL (NATURAL) CONSIDERATIONS AND VEGETATION PLAN

U.S. Army Corps of Engineers
Buffalo District

Appendix
R 7/90



EA-E-1

Figure 1

Limestone Ck - Fayetteville, N.Y.

General Sketch
Areas of Riparian
and Immediate Vegetation

USACOE Buffalo District

Figure 2. Aerial view of Fayetteville looking north (downstream) on Limestone Creek.

ENVIRONMENTAL (NATURAL) CONSIDERATIONS AND VEGETATION PLAN

Existing Conditions - Figure 1 generally identifies areas of potentially impacted woody riparian vegetation. The stream reach from the southern project limit to the dam is part of a quality cold water trout stream. Reference Photo 1 also.

Without Conditions (No Action) - It is anticipated that periodic disruption to the stream channel bed and riparian vegetation (including some removal) would occur at the local level due to periodic flooding and associated channel repair and maintenance.

Project Impacts and Considerations - Figure 2 generally identifies proposed project levee, floodwall, and berm placement and alignment; and the general environmental (natural) considerations and vegetation plan. Reference the Key to Symbols and the cross-section figures also.

Major Environmental (Natural) Concerns:

Removal of approximately 2000 linear feet of woody riparian vegetation from the west embankment (approximately 1600 linear feet from the area south of the bridges, and 400 linear feet from the area north of the bridges).

Removal of approximately 1500 linear feet of woody riparian vegetation from the east embankment (approximately 500 linear feet from the area south of the bridges, and 1000 linear feet from the area north of the bridges).

Levee and floodwall and riprap construction along the creek.

Environmental (natural) Considerations and Measures:

Instream construction activity to be limited to July 1 to October 1.
Avoid spring construction, if possible.

Minimize construction in the channel bed to protect existing trout fishery in-stream habitat.

Set back levees, where possible, to retain existing riparian vegetation or to provide some room for planting new riparian vegetation important to the trout fishery habitat for shade, cover, and food source.

Expeditious grass/legume vegetation of levees.

Retain approximately 1,000 linear feet of existing riparian vegetation along the south/east embankment south of the floodwall/bridge area and approximately 800 linear feet in the area north/east of the bridges.

Periodic placement of planted boulders about a foot higher than the stream bed to create riffle/pool/areas.

Provide in-stream fishery ledge cover structures at outer bends south and just north of the bridges in areas where riparian vegetation has been removed. Direct low-flow channel flows accordingly.

Plant approximately 800 linear feet of willow/dogwood plant species in acceptable levee setback area on the west bank north of the bridges.

Plant approximately 200 linear feet of willow/dogwood plant species in acceptable levee setback areas on the east embankment, north of the bridges.

Plant shade and/or landscape plantings, where possible, along western and eastern embankments, levee, and floodwall.

Incorporate plan features to accommodate potential future park and fishermen access developments by the locals.

NOTE: Reference the planting guidelines which follow, also.

KEY TO SYMBOLS (SEE THE PLAN WHICH FOLLOWS)

Levee Alignment
Note: Creek side of levee is riprap

Floodwall
Note: Creek side of floodwall is riprap

Vegetation Retention

Red Osier/Silky Dogwood Plantings

Fishery Ledge Cover Structure

Potential Additional Planting Areas

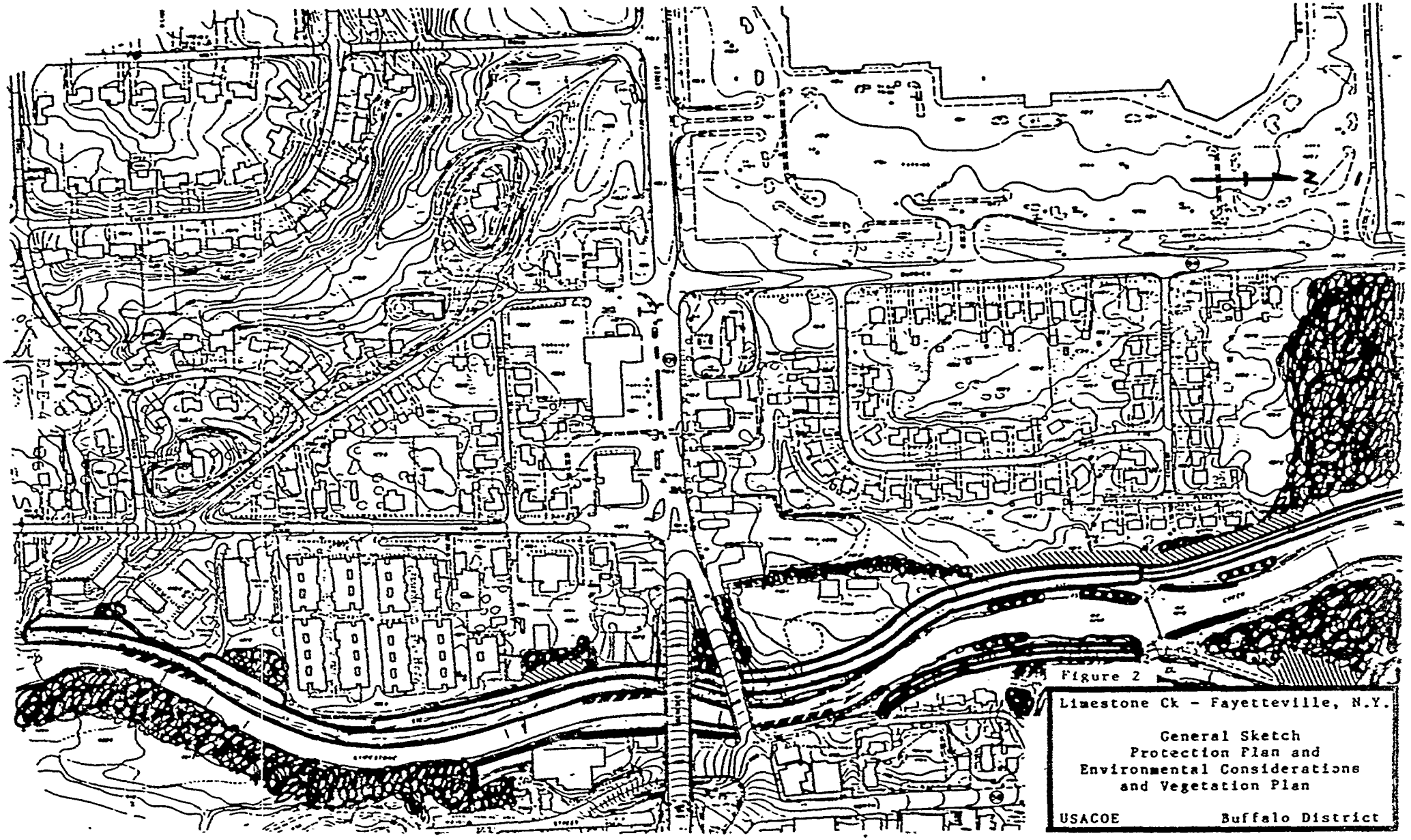


Figure 2

Limestone Ck - Fayetteville, N.Y.

General Sketch
Protection Plan and
Environmental Considerations
and Vegetation Plan

USACOE Buffalo District

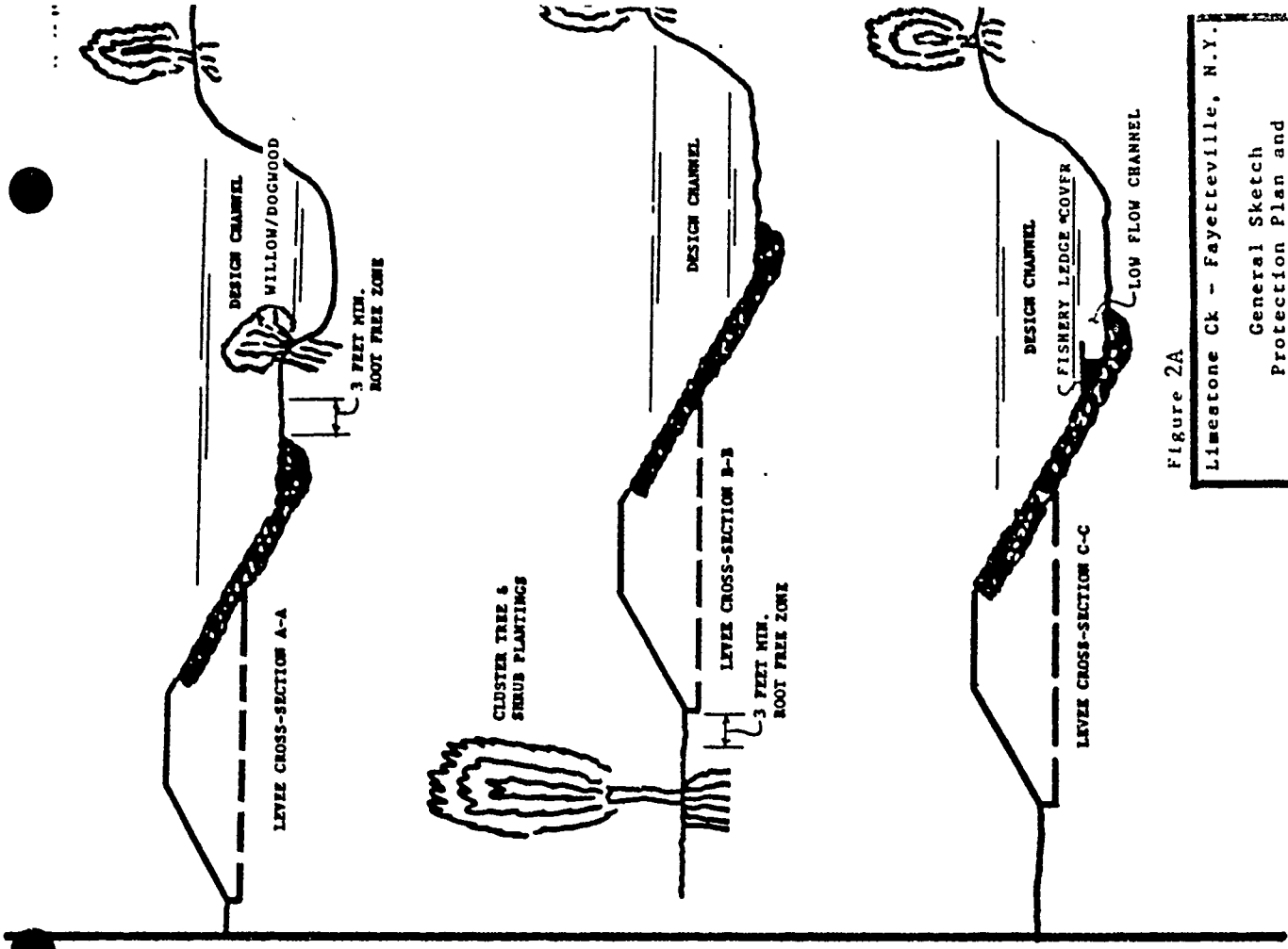
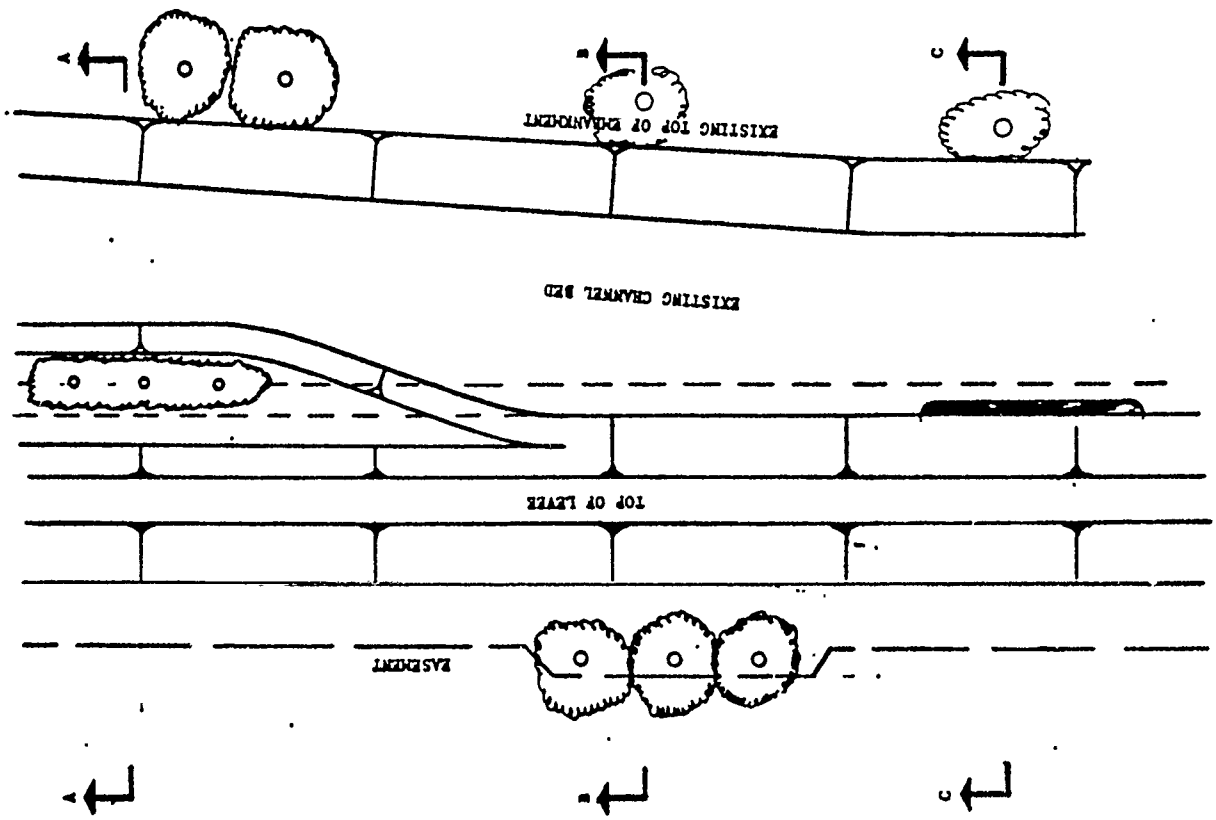


Figure 2A

Limestone Ck - Fayetteville, N.Y.
General Sketch
Protection Plan and
Environmental Considerations
and Vegetation Plan
USACOE Buffalo District



APPENDIX E

LIMESTONE CREEK, FAYETTEVILLE, NY
PLANTING GUIDELINES

E1. HERBACEOUS PLANTING

a. General.

A grass or grass/legume seeding mixture would be planted on the newly constructed levees (+ 2.29 acres), as well as on disturbed soils off the levee in the work area (1.05 acres or more). The grass seed mixture would consist of three grass species - creeping red fescue (Festuca rubra), red top (Agrostis gigantae) and tall fescue (Festuca arundinacea), which would be seeded at least at the minimum total seed mixture rate of 42 pounds/acre (20 pounds creeping red fescue; 2 pounds of red top and 20 pounds of tall fescue). The grass/legume seed mixture would consist of reed canarygrass (Phalaris arundinacae), red top and birdsfoot trefoil (Lotus corniculatus), which would be seeded at least at the minimum total seed mixture rate of 30 pounds/acre (15 pounds reed canarygrass; 5 pounds redtop; 10 pounds birdsfoot trefoil).

b. Seedbed Preparation.

The soil surface at the planting site would be scarified to a depth of at least 2 inches by using a disk or other suitable method. Lime and fertilizer would be applied according to a soil test and mixed into the surface soil to a depth of at least 2 inches. If lime and fertilizer are applied by hydro-seeder, incorporation into the soil would not be practical.

c. Seed Specifications.

Certified seed would be used. Legumes would be scarified and innoculated with the proper strain of nitrogen - fixing bacteria before seeding.

d. Time of Seeding.

Ideally - if at all possible - seeding would be done between 15 March and 15 May during the spring season, or between 15 August and 1 October. However, if seeding was accomplished during the drier summer season, more frequent watering of plants may be required. If needed, a temporary seeding of annual ryegrass would be made in the fall and overseeded in the spring with the grass or grass-legume seed mixture.

e. Mulching.

In order to establish the grass or grass-legume vegetation on levees and other disturbed soil areas, a mulch cover would be applied to help hold soil moisture, protect soil from erosion, hold seed in place, and to help keep soil temperatures more constant. The type of mulch and mulching method to be used would be determined prior to seeding.

f. Seeding and Planting.

A grass drill is the best method of seeding on nearly level to sloping areas, but the preferred method will depend on slope and conditions of the planting site. Very small seed would be seeded no more than 1/4 to 1/2-inch deep. Other methods of seeding may be broadcast seeding (by using a cyclone seeder or seeding by hand), or by hydroseeding (which would apply seed, lime, fertilizer, and mulch materials - including innoculant if legumes are included in the seed mixture - in a slurry).

g. Maintenance.

Annual fertilization applied at a rate prescribed by a soil test is recommended to help maintain the seeding once it was established.

E2. WOODY PLANTING

a. General.

Trees and shrubs would be planted on disturbed soils off the levee and at least 15 feet from the base of the landward toe of the levee. In general, soils peripheral to the creek in the project locale are mapped as Wayland silt loam - which is a very poorly drained to somewhat poorly drained, therefore, trees and shrubs selected for planting would have to be adaptable to this soil type. The variety of woody plantings from which to choose would include white and/or Norway Spruce evergreen trees (Picea glauca and Picea abies, respectively), and such shrubs as Arrowwood viburnum (Viburnum dentatum), purple-osier willow (Salix purpurea), red-osier dogwood (Cornus stolonifera), silky dogwood (Cornus amomum) and Tartarian Honeysuckle (Lonicera tatarica). Trees and shrubs would be planted prior to 15 May in the spring and after 1 October for fall planting.

b. Plant Establishment.

As needed, plants would be watered if necessary to maintain an adequate moisture supply within the root zone. Plants would be mulched and any broken branches would be pruned.

c. Staking and Guying.

Trees would be staked and guyed, and hose chafing guards would be used where wire could contact the plant.

d. Maintenance During Installation.

Maintenance would begin immediately after each tree and shrub is planted and would continue until final acceptance by the Corps. As needed, during this maintenance period, plants would be watered, pruned, and sprayed and any other necessary operations of maintenance performed. A preliminary inspection would be held approximately 12 months from the date of the beginning of plant establishment period to determine plant acceptability and the number of replacements. Plants not in healthy growing condition would be noted and as soon as seasonal conditions permit, would be removed from the site and replaced. Establishment of herbaceous plants would also be conducted during this period and replacement of seedings made if and where needed.

e. Red-osier and Silky Dogwood Planting.

Plant two rows of flood tolerant shrubs consisting of Red-osier Dogwood and Silky Dogwood in areas identified on the vegetation retention and planting plan. Plantings should be placed, where possible, in available areas between the creekside toe of the levee and the existing creek bed embankment along the top of the embankment. Shrubs are to be spot planted in clumps of two rows approximately 75 to 100 feet long using staggard shrub spacing of 3 feet by 3 feet. Plant the Red-osier Dogwood in the creekside row. Reference items a. through d. also.

(1) Maintenance.

Maintenance would include periodic replanting of vegetation lost from original planting areas and trimming back and removal of excessive growth (i.e. clumping growth in excess of 5 feet wide by 100 feet long by 12 feet high).

E3. MONITORING

Monitoring would be accomplished via project inspection and maintenance agreements.

FAYETTEVILLE, NEW YORK

ENV. APPEN. F - STANDARDIZED EROSION AND SILTATION PROTECTION MEASURES

U.S. Army Corps of Engineers
Buffalo District

EXTRACTED FROM: THE CIVIL WORKS CONSTRUCTION GUIDE SPECIFICATION - ENVIRONMENTAL PROTECTION
(CW-01430 JULY 1978)

7.1.3 Reduction of Exposure of Unprotected Erodible Soils. Earthwork brought to final grade shall be finished as indicated and specified. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in instances where the constructed feature obscures borrow areas, quarries and waste material areas, these areas shall not initially be cleared in total. Clearing of such areas shall progress in reasonably sized increments as needed to use the areas developed as approved by the Contracting Officer.

7.1.4 Temporary Protection of Disturbed Areas. Such methods as necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

(1) Retardation and Control of Runoff. Runoff from the construction site shall be controlled by construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses, and any measures required by area-wide plans approved under paragraph 208 of the Clean Water Act.

(2) Sediment Basins. Sediment from construction areas shall be trapped in temporary or permanent sediment basins in accordance with basin plans shown on the drawings. The basins shall accommodate the runoff of a local "(design year) storm. After each storm the basins shall be pumped dry and accumulated sediment shall be removed as necessary to maintain basin effectiveness. Overflow shall be controlled by paved weir or by vertical overflow pipe, draining from the surface. The collected top soil sediment shall be reused for fill on the construction site, and/or conserved (stockpiled) for use at another site(s). The Contractor shall institute effluent quality monitoring programs as required by state and local environmental agencies.

NOTE: THE DESIGN YEAR STORM IS DETERMINED BY THE DOWNSTREAM ENVIRONMENT TO BE PROTECTED. ESTIMATE OF DAMAGE TO THE DOWNSTREAM ENVIRONMENT VERSUS THE DESIGN YEAR STORM THAT WILL CAUSE THIS LEVEL OF DAMAGE SHOULD BE MADE AND THE APPROPRIATE PROTECTION IMPLEMENTED. IN THE EVENT PERMANENT SEDIMENT BASINS ARE NECESSARY FOR THE PARTICULAR PROJECT, THESE PERMANENT FACILITIES SHALL BE INCLUDED IN THE PROJECT DESIGN AND THE CONTRACT DOCUMENTS; IF PERMANENT BASINS ARE NOT REQUIRED, DELETE REFERENCE THERETO.

7.1.5 Erosion and Sedimentation Control Devices. The Contractor shall construct or install all temporary and permanent erosion and sedimentation control features as indicated on the drawings. Temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.

7.1.7 Borrow Areas on Government Property shall be managed to minimize erosion and to prevent sediment from entering nearby water courses or lakes.

7.1.8 Spoil Areas on Government Property shall be managed and controlled to limit spoil to areas designated on the drawings and prevent erosion of soil or sediment from entering nearby water courses or lakes. Spoil areas shall be developed in accordance with the grading plan indicated on the drawings.

7.1.9 Temporary Excavations and Embankments for plant and/or work areas shall be controlled to protect adjacent areas from dispoilment.

ENV. APPEN. G - REFERENCES

1. "Flood Damage Survey for Limestone Creek Manlius and Pompey Townships, NY;" prepared by McPhee, Smith, Rosenstein Engineers, P.E., for the U.S. Army Corps of Engineers, Buffalo District; April 1980.

2. "Onondaga County - 1995 Land Use Plan;" prepared by Syracuse - Onondaga County Planning Agency; July 1977.

3. "An Appraisal of Potential Outdoor Recreational Developments in Onondaga County, NY, 1968;" published by Onondaga County Soil and Water Conservation District, and the Cooperative Extension Association of Onondaga County, Agricultural Division.

4. "Census of Population and Housing, 1980 (Micro-Fiche);" Bureau of the Census.

5. "1980 OBERS - BEAU Regional Projections; Vol. 3 Standard Metropolitan Statistical Areas;" U.S. Department of Commerce.

6. "New York State Water Quality Management Plan, Population Projections, 15 January 1981;" New York State Department of Environmental Conservation, Division of Water.

7. "New York State Business Fact Book; 1972 and 1980 Supplements;" New York State Department of Commerce.

8. "Soil Survey of Onondaga County, NY;" U.S. Department of Agriculture, Soil Conservation Service; 19

9. "Onondaga County, NY - Prime Farmland Mapping Units, 1981;" Soil Conservation Service.

10. "Onondaga County, Fresh Water Wetlands - Map;" Onondaga County, Environmental Management Council; 1977.

11. "Basic Statistics for Counties and Metropolitan Areas of New York State;" New York State Department of Commerce, 1973.

12. "Today's Environment - Tomorrow's Hopes;" produced by the Town - Village Environmental Council; 1981.

13. "Section 205 Reconnaissance Report on Flooding of West Branch of Limestone Creek, Manlius, NY;" Corps of Engineers, Buffalo District; July 1977.

14. "Summary of Environmental Considerations, Limestone Creek Watershed, Fayetteville, NY;" Corps of Engineers, Buffalo District - Environmental Resources Branch; February 1983, (Planning Aid Document).

15. "USGS Quad Maps."

16. "County, Town, and Village - Land Use and Zoning Maps."

17. "Limestone Creek, Manlius Township, NY; Flood Plain Information Report;" U.S. Army Corps of Engineers, Buffalo District; December 1970.

18. "Reports of Investigations - A Cultural Resources Survey of Proposed Flood Control Project Areas On and Near Limestone Creek in Fayetteville, New York"; prepared by Archaeological Consulting and Services for the U.S. Army Corps of Engineers, Buffalo District; July 1983.

19. "Road Map of Onondaga County, NY;" issued by the Department of Public Works, Division of Highway.

20. Reference Public Involvement and Coordination section of this report and Correspondence Appendix; particularly correspondence from the New York State Department of Environmental Conservation and the U.S. Fish and Wildlife Service.

FLOOD DAMAGE REDUCTION PLANS AT FAYETTEVILLE, NY
UNDER AUTHORITY OF SECTION 205
OF THE 1948 FLOOD CONTROL ACT
AS AMENDED

ENVIRONMENTAL APPENDIX H

COMMENT/RESPONSE APPENDIX
PUBLIC COMMENT AND CORPS' RESPONSES ON THE DRAFT DPR AND DRAFT EIS

U.S. Army Corps of Engineers
Buffalo District
1984

COMMENT/RESPONSE APPENDIX

COMMENT RESPONSE ON THE LIMESTONE CREEK, FAYETTEVILLE, NY. DRAFT DETAILED PROJECT REPORT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT.

United States Department of Agriculture

Soil Conservation Service

James M. Hanley Federal Building
100 S. Clinton Street, Room 771
Syracuse, New York 13260

August 5, 1984

Colonel Robert R. Hardiman
District Commander
U.S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, New York 14207

OFC. MGMT. GAS
13 AUG 84 13 08

Dear Colonel Hardiman:

We have reviewed the Main Report and Environmental Impact Statement for the Limestone Creek Local Flood Protection in Fayetteville, New York, prepared by the U.S. Army Corps of Engineers, dated July 1984.

1 Items of interest and concern to the Soil Conservation Service have been adequately displayed or discussed.

We appreciate the opportunity to review and comment upon this proposal.

Sincerely,

Paul A. Dodd
State Conservationist

cc: Peter C. Myers, Chief, SCS, Washington, D.C.
Dwight Holman, AC, SCS, New Hartford, NY
Howard V. Schuster, DC, SCS, Syracuse, NY

EA-H-1

The Soil Conservation Service is an agency of the Department of Agriculture

U. S. Department of Agriculture
Soil Conservation Service

Comments Received: 13 Aug 84

1. Thank you for your review.
No further response necessary.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278

OFC. MGMT. OAS
20SEP 84 10 15

17 SEP 1984

Class: PR-

Colonel Robert R. Hardiman
Department of the Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

Dear Colonel Hardiman:

EA-H-3

1 We have reviewed the draft environmental impact statement (EIS) for the Limestone Creek local flood protection study, Onondaga County, New York. The proposed project provides for the construction of a 2,950 foot long levee, a 1,250 foot long floodwall and two berms, the installation of rip-rap and the relocation of three homes and an activity center. We offer the following comments for your consideration.

2 We have no objection to the proposed installation of rip-rap and in general we find that the 404(b)(1) evaluation included in the report to be adequate in that no wetlands would be impacted by the proposed action. However, on page EIS-18 of the report, it is stated that "generally all wetlands greater than 10 acres are under section 404 (Clean Water Act) jurisdiction unless exempted by section 323.4-2 of the permit regulations." This statement should be revised to reflect that all wetlands are subject to section 404 jurisdiction although Nationwide Permits authorize work in certain categories of wetlands.

3 The EIS indicates that the entire length of the creek is bordered by a nearly continuous band of riparian vegetation which provides excellent wildlife habitat and stream cover, supporting a high quality cold water fisheries habitat. The proposed project would entail the removal of most of the riparian vegetation on the west bank to accommodate levee construction. Removal of the riparian vegetation along the creek bank would adversely impact fishery habitat by increasing light exposure and temperature of the creek as well as destroying valuable wildlife habitat. While the EIS indicates that the COE is considering the retention of some vegetation, plantings and levee setbanks where practicable, we believe that the proposed plan should include a proposal of mitigation measures to offset the habitat destruction in those areas where it is infeasible to avoid adverse impacts. We concur with the U.S. Fish and Wildlife Service recommendation that a strategy for minimizing destruction of vegetation and a revegetation plan should be developed for the proposed project prior to construction activities. To discuss this issue further, I suggest that you contact Mr. Robert Vaughn of EPA Region II's Marine and Wetlands Protection Section at (212) 264-5170.

U. S. Environmental Protection Agency Region II — Comments Received: 20 Sep 84

1. Thank you for your review and comments.

2. The statement was in error and has been revised to read as follows: "Also discharge of dredged or fill material into wetlands adjacent to waters of the United States are regulated by the U. S. Army Corps of Engineers under Section 404 of the Clean Water Act."

3. A Vegetation Retention and Planting Plan has been included in the Environmental Appendices (Environmental Appendix - E) which follows the EIS. This plan will be incorporated into the final plans and specifications prepared after approval of the DPR/EIS report by higher authority. Sections of the report pertaining to the plan description and effects on water quality, vegetation, wildlife, and fisheries have been modified accordingly.

In accordance with EPA policy, we hve rated this EIS as ER-2, indicating that we have environmental reservations (ER) concerning the mitigation measures and that we require more information (2) to ensure adequate mitigation for the proposed project.

Thank you for the opportunity to comment. Should you have any questions, please call Ms. Christine Yost of my staff at (212) 264-0722.

Sincerely yours,

Richard M. Walka

Richard M. Walka, Chief
Environmental Impacts Branch

EA-H-4

EA-H-5

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Project Review
1500 Custom House
165 State Street
Boston Massachusetts 02109

IN REPLY REFER TO
ER-84/986

September 18, 1984

Colonel Robert R. Hardiman
District Engineer, Buffalo District
U. S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207

20 SEP 84 10 20 OFC. MGMT. OASA

Attention: Mr. Charles Zurmentsch

Dear Colonel Hardiman:

1 The United States Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) and Draft Detailed Project Report (DDP), Limestone Creek Local Flood Protection, Onondaga County, New York (ER 84/986).

General Comments

2 In our view the document, while providing a good description of the proposed project facilities and alternatives and project related impacts on fish and wildlife resources, remains deficient regarding the discussion of potential flooding above and below the proposed project and the wetland acreage covered by Section 404 of the Clean Water Act. The following paragraphs will detail our concerns.

Specific Comments

3 Increased discharges are mentioned briefly on page 21 of the Detailed Project Design, but further discussion, particularly relative to induced flooding above and below the project area is lacking. The environmental impact statement should contain a section which addresses this aspect of the project.

4 On pages EIS-18 (3.26) and EIS-33 (4.12), it is indicated that only wetlands of greater than 10 acres are covered under Section 404 of the Clean Water Act. This error needs to be corrected. Section 404 of the Clean Water Act does not indicate a size limitation on wetlands to be covered.

5 The fisheries discussion on pages EIS-19 and 20 should include the results of New York State Department of Environmental Conservation's electrofishing survey in the proposed project area conducted in 1983. Basically, the results of the above indicate a stronger presence of salmonids, which should be worked into paragraphs 3.28 (page EIS-19) and 3.31 (page EIS-20).

U. S. Department of the Interior
Office of the Secretary
Office of Environmental Project Review

Comments Received: 20 Sep 84

1. Thank you for your review and comments.

2. Reference Responses which follow.

3. The reference to "increased discharges" on DPR page 21 was in the context of the nature of flooding without the project; ie, under existing conditions. Under existing conditions, once the left bank levee is overtopped, most of the additional flow ("increased discharges") goes into the left overbank (flooding). The proposed plan will confine the 100-year flood within the creek, which means that the water surface in the creek will be higher with the project. The project includes protection for the right bank to compensate for those higher water levels.

The proposed project is designed so that communities above and below Fayetteville will not suffer additional flooding problems due to the project. Increases in water surface elevation due to the project will occur only between the upstream end of the proposed levee and a point 700 feet downstream of the existing dam.

A similar statement has been included in paragraph 4.21 on page EIS-35 under Flooding and Man-Made Resources.

4. The statements were in error and have been revised.

5. The paragraphs have been amended accordingly.

Summary Comments

6 While the ramifications of flooding above and below the proposed project area may be woven through the fabric of the two reports, their discussion in a separate section of the environmental impact statement would make them more visible and easily understood.

7 These comments do not preclude separate evaluation and comments by the Fish and Wildlife Service pursuant to the Fish and Wildlife Coordination Act on the Section 10/404 permits required by the Army Corps of Engineers.

8 The Fish and Wildlife Service may concur, with or without stipulations, on permit issuance depending on the effect on fish and wildlife resources. It would appear that the Fish and Wildlife Service would probably recommend as a minimum those considerations addressed in the Fish and Wildlife Coordination Act Report included in the DEIS and DDF as an appendix.

Sincerely yours,

William Patterson

William Patterson
Regional Environmental Officer

EA-H-6

6. Reference comment response number 3.

7. Statement acknowledged.

8. Statement acknowledged.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

September 17, 1984

21 SEP 84 10 58
OFC.MGMT.OAS

Colonel Robert R. Hardiman
Corps of Engineers - Buffalo District
Department of the Army
1776 Niagara Street
Buffalo, New York 14207

ATTN: Mr. Charles Zernenstsch

Dear Colonel Hardiman:

EA-H-7

1 This is in reference to your draft environmental impact statement for the Section 205 Flood Control Study of Limestone Creek in Onondaga County, Fayetteville, New York. Enclosed are comments from the National Oceanic and Atmospheric Administration.

We hope our comments will assist you. Thank you for giving us an opportunity to review the document. We would appreciate receiving four copies of the final environmental impact statement.

Sincerely,

Joyce Wood

Joyce M. Wood
Chief, Ecology and
Conservation Division

Enclosure

DC:das

U. S. Department of Commerce
National Oceanic and Atmospheric Administration

Comment Received: 21 Sep 84

1. Thank you for your review and comments. See comment and response. Next page.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Washington, D.C. 20230

N/MB21x6:VLS

SEP 13 1984

TO: PP2 - Joyce M. Wood

FROM: M - Paul M. Wolff Paul M Wolff

SUBJECT: DEIS 8407.21 - Flood Control Study of Limestone Creek in Onondaga County, Fayetteville, New York

1 The subject statement has been reviewed within the areas of the National Ocean Service's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

2 Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project include the cost of any relocation required for NOS monuments. For further information about these monuments, please contact Mr. John Spencer, Chief, National Geodetic Information Branch (N/CG17), or Mr. Charles Novak, Chief Network Maintenance Section (N/CG162), at 6001 Executive Boulevard, Rockville, Maryland 20852.

EA-H-8

U. S. Department of Commerce
National Oceanic and Atmospheric Administration

Comments Received: 21 Sep 84

1. Thank you for your review and comments.

2. We are not aware of any permanent bench marks or triangulation points in the proposed construction areas.

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-0001

Henry G. Williams
Commissioner

OFC. MGMT. OAS
27 SEP 84 11 34

September 24, 1984

District Commander
Buffalo District
U. S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Attn: Mr. Charles Zernentsch

Dear Sir:

EA-H-9

1 This office has reviewed the Draft Detailed Project Report and Environmental Impact Statement for local flood protection Limestone Creek, Fayetteville, New York and has no comments on the report and E.I.S.

Sincerely,

James F. Kelley
Director
Flood Protection Bureau

TEA:pt

cc: Henry Carroll

New York State
Department of Environmental Conservation

Received 27 Sep 84

1. Thank you for your review.
No further response necessary.

ONONDAGA COUNTY
ENVIRONMENTAL MANAGEMENT COUNCIL

September 13, 1984

Robert R. Hardiman, District Engineer
U.S. Army Corps of Engineers, Buffalo District
1776 Niagara Street
Buffalo, New York 14207

17 SEP 84 11 30 AM OFC. MGMT. OAS

Dear Colonel Hardiman:

1 The Onondaga County Environmental Management Council (EMC) has prepared comments on the proposed Local Flood Protection Project for Limestone Creek in the Village of Fayetteville. The Council has expressed interest in this project based on its proximity to state and county highways and also based on the potential intermunicipal significance of the flood protection project.

One of the major concerns expressed by EMC members is over the limited scope of the project analysis, as the report appears to be limited to addressing flooding impacts affecting a one-half mile reach of Limestone Creek within the Village of Fayetteville. No information is provided in the report concerning the potential upstream and downstream impacts resulting from the constriction of floodwaters by approximately 3,400 feet of levees in the Village of Fayetteville. Questions were raised by EMC members about the effects these levees may have on flood flow velocities and on increased flood elevations that may result upstream of the project and downstream from Fayetteville past the Erie Village development to the Village of Minoa.

3 Another area of concern needing further explanation is the effects of backflow in the Fayetteville Mall drainage ditch and 100-year flood contributions from Evans Brook which discharges to Limestone Creek through this drainage ditch. Can the present open ditch adequately handle inflow from Evans Brook plus backflow from Limestone Creek even with a levee system in place?

4 Construction of the levee system will require the movement of heavy machinery, construction materials, and equipment into streambank areas that presently are constricted by the creek and by natural and man-made barriers. The project report does not adequately discuss the question of access for heavy machinery, and how the resultant erosion and siltation will properly be handled. Will there be storage or spoil areas for earth and other materials removed from the stream banks? Will the necessary easements and right-of-ways be available prior to start of construction?

5 Concerns were raised by some EMC members over the aesthetic impacts and safety concerns (especially for children) due to construction of 10-12 foot high levees. The visual impacts of such high levees may be severe, particularly adjacent to commercial and residential areas. What are the Corps' plans for mitigating these impacts? Questions were also raised about the impact of the levee system on existing patterns of zoning and land use within the Village of Fayetteville. Will construction of the levee encourage increased development of presently vacant lands within the 100-year flood plain?

6 Since a number of questions were raised about the cost figures presented in the main report, EMC obtained a copy of "Appendix B - Economics" which describes in greater detail the economic evaluation prepared for this project. While EMC is in general

1100 CIVIC CENTER 421 MONTGOMERY ST. SYRACUSE, N.Y. 13202 (315)425-2640

EA-H-11

Onondaga County
Environmental Management Council

Comments Received: 17 Sep 84

1. Thank you for your review and comments.

2. Scope of Report. Although the recommended plan provides flood damage reduction only in the Village of Fayetteville, other reaches of the stream were studied before the proposal was made (Reference: STUDY SCOPE and STUDY AUTHORITY in the DPR and EIS; RELATED STUDIES, DPR page 2 and 4; PLANS ELIMINATED FROM FURTHER STUDY, EIS page 3, particularly paragraph 2.05; and PUBLIC INVOLVEMENT PROGRAM, EIS page 46, paragraph 6.03 and Table (Text) 4). The villages of Manlius and Fayetteville have historically had high flooding damages in a small land area; hence the ratio of flood reduction benefits to construction costs is greater than one. Corps of Engineers flood control projects must be designed so that the difference between annual damage reduction and annualized cost is maximized (Reference Economic Criteria, DPR page 15). A similar Section 205 - flood damage reduction study report is being prepared by the Corps, Buffalo District for the village of Manlius vicinity.

Damages in other Parts of the Basin. Flooding problems in communities up and downstream of Fayetteville will not be aggrevated by the proposed project. Increases in water surface elevation due to the project will occur only between the upstream end of the proposed levee and a point 700 feet downstream of the existing dam.

3. Mall Ditch. Yes. Drainage from Evans Brook through the mall ditch can be excessive under existing conditions. During the "81" flood, water entered the flood plain through or over the existing levee in the southern project limit vicinity. These waters flowed through and flooded the developed flood plain area and reentered the creek in the vicinity of the dam and mall ditch.

With the proposed plan, water (to the 100-year event level) would be contained within the stream channel by the improved levees and would not enter the flood plain from the southern project limit as it has and can presently. Therefore, a substantially reduced volume of water would be reentering the creek through and in the vicinity of the mall ditch. With the proposed plan, flooding due to backwater and floodplain drainage (Fayetteville Mall ditch) would be minimal. Reference Plate 4 in the Detailed Project Report. This plate illustrates the design flood pool (with the project) for the 100-year flood event, which has a discharge about 35 percent greater than the 1981 flood. Although the plate shows the Kennedy, Warner, and Sims Street vicinity covered with water during the 100-year flood; the depth of water is just a few inches, and will not cause structural or content damage. During lesser floods, even this "lawn flooding" will not occur.

A tie-back levee was evaluated for the vicinity. The tie-back levee could eliminate even the 100-year event damages, but would not be incrementally justified, and would create an interior drainage problem which is very expensive to solve.

4. Equipment, Storage, Easements, Siltation. Generally, movement of heavy equipment and materials would occur along (major) roads with design capabilities to handle such movement and/or temporary access roads (permanent for project maintenance access in some cases) built specifically for project access. Generally, limited access would be obtained through available open (ie., field) areas a short distance to the construction area. Most movement

CONTINUED

6 Cont. agreement with the economic evaluation prepared for the [illegible] plan of levee/floodwall protection, the project report does not adequa[illegible]e the economic costs/benefits of the no-action alternative utilizing the Na[illegible] Flood Insurance Program. While recognizing that the NFIP will not provide any physical protection from flood waters to residential and commercial property owners, the availability of flood insurance nevertheless offers an economic alternative to those properties. This alternative in terms of total annual insurance costs for the affected properties is not described in the report.

7 Another insurance factor which should be described in greater detail is the cost of recovering flood losses attributed to commercial versus residential properties. The report indicates that the Fayetteville Mall shopping complex alone accounts for $18 million of the approximately $25 million damages predicted for a 100-year flood event. Is there an alternative available for flood-proofing the shopping mall that would be less expensive than constructing a levee/floodwall system along Limestone Creek? Appendix B indicates that 95 residential flood insurance policies have been written in the Village of Fayetteville, but there is no information on the number of commercial policies written and the extent of the available coverage.

8 The project report describes the public involvement process through January 1984 used in the plan formulation and for public notification of the study progress and schedule. The next step in the public involvement process should be a detailed explanation of the proposed project, including potential impacts to the residents of the Village of Fayetteville and to other affected citizens in the Town of Manlius. While the project report describes many of the relevant environmental and economic issues associated with the proposed project, EMC members have raised several additional issues which should be resolved prior to final acceptance of the project report.

9 The Onondaga County Environmental Management Council believes that the proposed flood protection project may have impacts outside the Village of Fayetteville needing further analysis. Additional study is needed of alternatives to the proposed levee/floodwall construction project, including the cost of flood insurance protection for residential and commercial properties. Potential impacts of the proposed project on future land use and zoning in the Village of Fayetteville need further analysis. In addition, the Environmental Management Council recommends that one or more public hearings be held to inform residents of the general findings of the project report, including the comments received on the July 1984 report.

EA-H-12

Very truly yours,

Gary R. Schoonmaker
Chairman

cc: James M. Lennon, Mayor
Village of Fayetteville
Angelo Albanese, Mayor
Village of Manlius
Donald Crossett, Mayor
Village of Minoa
Richard Lowenberg, Supervisor
Town of Manlius
William Minor, Chairman
Manlius Environmental Advisory
Commission
Karen Kitney, Chairperson
Onondaga County Planning Board

GRS/cjk/wp

and activity would occur along or in close proximity to the construction alignment. Any necessary temporary storage areas would also likely be sought in close proximity to the construction area. All necessary easements and right of way will be in place before start of construction. Access, spoil, and borrow areas will be identified (specifically) after award of the contract.

Construction and movement of heavy equipment will induce some erosion and downstream siltation. This will be reduced by avoiding instream construction until late spring, when the likelyhood of high discharges is less. Erosion protection measures are also considered in preparation of plans and specifications (ie., riprap, mulching, revegetation, settling basins, spraying for dust, etc.).

5. Aesthetics, Safety, Development. Aesthetics are discussed to some degree in the EIS (Reference EIS pages 29 and 43). The new levee height would generally be from 3 to 6 feet higher than the former levee and of improved quality. The proposed levees will have a fairly gentle slope (1 foot vertical rise for every 3 feet horizontal) which will be landscaped. Details on landscaping are not final. Landscape vegetation (generally grasses and/or legumes on the levee structure with some trees inside the landside of the levee) must not threaten the integrity of the levee; but, it is expected that the species selected will provide a pleasing appearance with little maintenance. The gentle slope will also minimize safety hazards. In general, we believe the levees offer little inherent danger. Measures are enforced during the construction period to reduce construction related health and safety hazards. Parents should be aware, however, that the reck may be more accessable to children on foot than it was before. We would consider any suggestions you have.

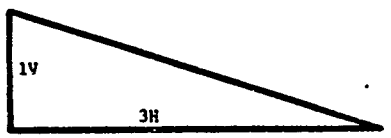


ILLUSTRATION OF 1V ON 3H SLOPE

The Federal Emergency Management Agency determines the area covered by the 100-year flood from its own hydraulic and hydrologic analysis. FEMA estimates the 100-year discharge at the gage in Fayetteville to be 11,300 cubic feet per second (cfs); the Corps estimate is only 9600 cfs. It is possible that FEMA could define a post-project floodplain larger than the floodplain shown on Plate 4 of the Main Report (100-year flood, improved conditions), but we believe the Corps definition of the floodplain will be adopted by FEMA after completion of the project.

Those areas removed from the floodplain by the project could be developed without FEMA's restrictions. Because of the extent of existing development in the immediate project area, only limited additional development would be expected. Developers should know, however, that although the possibility of flood damage is substantially reduced, an extraordinarily rare severe flood could still cause extensive damage. Any new or redevelopment in the remaining flood plain areas would need to comply with flood insurance and flood plain management policies now in effect.

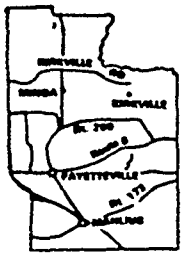
6. Economic Analysis of the No-Action Plan. The purpose of the economic analysis is to compare the costs and benefits of a proposed plan to see if the investment of Federal funds is warranted. That analysis is national in scope, not personal. From a national perspective, flood insurance merely redistributes the costs of flooding whereas, the proposed project eliminates a substantial portion of the expected damages.

7. Mall Protection. The same reasoning would apply to flood insurance coverage for commercial properties (see previous paragraph).

The development of an alternative to protect only the Mall development was considered but quickly rejected on several accounts. Flood protection for the Mall development would essentially benefit only one entity, the Mall developers. Flooding and associated hazards and damages to the remaining commercial and residential developments would be expected to continue. Federally funded flood protection benefiting primarily a single entity while leaving others essentially unprotected would in the least be controversial. There is less money available nationwide than is needed to fund the construction of the hundred or so proposed section 205 flood control projects, so a controversial project would receive a low priority for funding. This might effectively eliminate the possibility of Federal assistance, since each year new and more universaly endorsed projects in other areas of the country could receive higher priority for construction funding.

8. Plan Explanation. A meeting about the proposed plan was held in Fayetteville by the Onondaga County Planning Board (OCPB) on 5 Dec 84. Mr. William Werrick from the Corps was there to discuss the plan.

9. Reference the preceding responses.



Town of Manlius • Environmental Council

Fayetteville, New York 13066

MEMO

TO: James H. Lannon, Mayor
Village of Fayetteville

FROM: Joint Town-Village Environmental Council

RE: Limestone Creek: U. S. Army Corps of Engineers Draft Project Report for Local Flood Protection

DATE: September 12, 1984

EA-H-15

The Council reviewed this report at the September 11 meeting and has the following comments.

1 TMEC recommends a public meeting be held with Corps representatives present to describe and explain the suggested resolution for the flooding problems in the village of Fayetteville. Specific

2 invitations should go to the villages of Manlius and Minoa, and to the Town of Manlius. Since local funding is involved, the public needs to be carefully appraised of the plans with regards to the aesthetics, functioning, and maintenance of the proposed structures.

The proposed flood protection plans consist of levees (2950 ft.), concrete flood walls (1250 ft.) and two earthen berms (325 ft.), all running from 2 to 12 feet in height along the creek. These

3 structures will have the effect of channelizing the creek within the political limits of the village of Fayetteville. The constriction will produce higher stream velocities with correspondingly greater effects on any downstream structures.

The Council believes the scope of the Army Corps of Engineers study should be extended beyond the Fayetteville limits, at least to the

4 village of Minoa. Including its effect on the Fayetteville Mall ditch, the Erie Canal Aqueduct, and Erie Village.

The Mall ditch at the town/village boundary line should be redesigned and rebuilt as problems with sedimentation dumping at its entry into the creek have produced both stream erosion and backflow toward the Mall in times of high water. Mall

4a ditch waters should blend neatly with Limestone Creek waters to avoid eddies backflow and other detrimental effects. The placement of floodgates (either automatic or manual) on the Mall ditch, or pumping water from the ditch to the creek, or [illegible]rthwest, should be considered to prevent backflow.

Town of Manlius
Environmental Council

Comments Received: 17 Sep 84

1. Thank you for your review and comments. Reference Onondaga County Environmental Management Council Comment/Responses also.

2. Public Meeting. A meeting was held on 5 December 1984 in Fayetteville to discuss the project. All commentors were invited; most were present.

3. Effects Outside Fayetteville. The proposed project will affect water surface elevations and velocities (due to flood water containment) only in the stream reach defined upstream by the upstream end of the proposed levee, and downstream at a point 700 feet downstream of the New York State Department of Transportation feeder dam.

4. Scope of Study. Although the recommended plan provides flood damage reduction only in the Village of Fayetteville, other major reaches of the watershed were investigated to identify flood damages and potential for flood damage reduction measures. No effective watershed flood damage reduction measures could be economically justified. Only damages and potential localized flood damage reduction measures identified for the villages of Manlius and Fayetteville could justify additional (beyond an appraisal study) study and evaluation; under the Section 205 authority. The villages of Manlius and Fayetteville have historically had high flooding damages in a small land area; hence the ratio of flood reduction benefits to construction costs is greater than one. Corps of Engineers flood control projects must be designed so that the difference between annual damage reduction and annualized cost is maximized. A similar Section 205 Study report is being prepared by the Corps, Buffalo District for the village of Manlius vicinity. Analysis during that study identified no Federally economically justifiable flood damage reduction measures or additional studies for the Village of Minoa at this time. See the following responses also.

4a. Mall Ditch. Some minor realignment may be appropriate and can be considered in preparation of final plans and specifications which would follow approval of the Final Detailed Project Report.

With the proposed plan, flooding due to backwater and flood plain drainage (Fayetteville Mall ditch) would be minimal. Reference Plate 4 in the Detailed Project Report. This plate illustrates the design flood pool (with the project) for the 100-year flood event; a significant flood. The flood level in the Kennedy, Warner, and Sims Streets vicinity should be below first floor elevation. The flood elevation would be correspondingly less for more likely lesser flood events (ie., the 81 flood) and more removed from the developed area.

A tie-back levee was evaluated for the vicinity. The tie-back levee could eliminate even the 100-year flood event damages, but would not be incrementally justified, and would create an interior drainage problem which is very expensive to solve.

4b With the proposed levee system, there is the probability for continued and possibly increased flooding in Sims Place/Kennedy St./Warner R., which leaves this area better off than it is now.

4c According to a local engineering firm, the new housing at Erie Village on N. Burdick St. north of the Erie Canal (400 clustered townhouse units) will produce a one foot rise in floodwater elevation for the 100 year storm (a 4% chance of occurring in any year) when completed in the area from the NYS dam to the farm bridge near Rt. 257 north of Fayetteville.

4d The Erie Canal Aqueduct over Limestone Creek was tested during the 1961 storm according to an eye witness. The Aqueduct passed a recent inspection but there is concern whether its limited underpass area can withstand increased forces from higher velocity stream waters.

4e The confluence of Limestone Creek with Butternut Creek 1½ miles north of the village of Minoa has long been an area of serious flooding and the effects of this proposal should be evaluated on this village.

5 TMEC also suggests that (1) the levee be extended north across the town/village boundary line to the higher ground elevation along N. Burdick St. and (2) the flow in Evans Brook, which borders the Fayetteville Mall on the west and north, be diverted to the northwest away from the Mall ditch.

William F. Minor

William Minor
Chairman

Council Members

Laura Carroll
William Harris
Betsy Knapp
John Loosmann
Val Nasipak
Barbara Rivette
William Shramek
Richard Sturley

Administrative Secretary

Nancy Wilson

cc: Supervisor
Mayors; Minoa, Manlius
Army Corps of Engineers
County EMC
NYS DEC

EA-H-16

4b. Flooding at Sims/Kennedy/Warner. Although the area would experience minor flooding during a 100-year flood, the damage would be far less than it would be without the project. Flooding would be correspondingly less with lesser flood events. The tie-back levee could eliminate even the 100-year event damages, but would not be incrementally justified, and would create an interior drainage problem which is very expensive to solve.

4c. Erie Village. During report preparation, an analysis by a private consultant on the effects of Erie Village on flood levels upstream of Erie Village was reviewed by the Corps (O'Brien and Gere & Draft EIS - Dunn). At that time, the estimated increase in water height just downstream of the NYSDOT feeder dam was estimated at only 0.1 feet. Please furnish any conflicting data.

4d. Erie Canal Aqueduct. The Aqueduct will not be subject to higher forces or velocities as a result of the proposed project.

4e. Minoa. The proposed project will have no effect on Minoa's flooding problems.

5. (1) Reference paragraph 4b. (2) Such a diversion channel is not necessary and would probably not be cost effective. The Corps wishes to avoid unnecessary construction in and/or altercation of flows to wetland areas.

SEAR-BROWN ASSOCIATES, P.C.
Designing Your Tomorrow

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LEON H. CLARY, P.E., L.S./VICE-PRESIDENT
LEE O. AKINS, P.E., L.S./VICE-PRESIDENT

September 17, 1984

OFC. MGMT. DAS
18 Sep 84 11 04

District Commander
U.S. Army Engineer District
Buffalo
1776 Niagara Street
Buffalo, NY 14207

2581

Attention: Mr. Charles Zernentsch

RE: COMMENTS ON THE DRAFT DPR AND DRAFT DEIS
FOR THE FLOOD CONTROL PROJECT ON LIMESTONE CREEK
IN ONONDAGA COUNTY AT FAYETTEVILLE, NEW YORK

Dear Mr. Zernentsch:

EA-H-17

1 We have reviewed the copy of the Draft Detailed Project Report and Draft Environmental Impact Statement and Appendix for the Section 205 Flood Control Study of Limestone Creek in Onondaga County at Fayetteville, New York, on behalf of our client, the Fayetteville Mall.

2 The recommended plan, Scheme 1 (leeves and flood walls), provides maximum benefit with minimum disruption to the interests of Fayetteville Mall. For this reason, the Fayetteville Mall concurs with the recommendation of Scheme 1.

3 The only item which we feel needs further clarification in your reports is the matter of free board of the levees and flood walls above the design storm for your improvements. In order for the area to be protected by your improvements to qualify for levee protection according to the Federal Emergency Management Agency, the levee and flood walls must meet the minimum standards set forth in the publication by the Federal Emergency Management Agency, "Guidelines and Specifications for Study Contractors", Section 2-7.D.(2). This section specifies a minimum levee free board of three feet (3') with an additional one foot (1') of free board within 100' of either side of bridges and dams along the levee. An additional 0.5 feet of these minimums is also required at the upstream end, tapering to the minimum at the downstream end of the levee.

Sear-Brown Associates, P.C. Comments Received: 18 Sep 84

1. Thank you for your review and comments.

2. Concurrence acknowledged.

3. The issue of compliance with FEMA guidelines is complex. FEMA determines the outline of the floodplain based on their own hyrologic and hydraulic analyses. FEMA's 100-year discharge at the gaging station in Fayetteville is 11,300 cubic feet per second (cfs), while the Corps 100-year discharge is only 9,600 cfs. The Corps will work with FEMA to resolve these differences.

It is recommended that during the review process, coordination be instituted with the Federal Emergency Management Agency to insure compliance with their requirements. In addition to this
4 coordination, it is recommended that during construction the Federal Emergency Management Agency is kept abreast of project progress so that amended Flood Insurance Maps can be issued at the time of project completion.

Thank you for the opportunity to comment.

Very truly yours,

SEAR-BROWN ASSOCIATES, P.C.

By: Paul R. Way

Paul R. Way, P.E.

PRW:bss

cc: T. Wilmot

EA-H-18

4. Coordination has been initiated and will continue with the Federal Emergency Management Agency. Pertinent information will be coordinated with this agency.

District Commander, U.S. Army Engineer
District Buffalo, 1776 Niagra St
Buffalo, N. Y., 14207

Father Prescott L. Laundrie
110 Sims Pl., Fayetteville N.Y. 13066
August 6, 1984

Attn. Charles Zernentsch

Gentlemen

The Laundries appreciate the time, effort, concern, expense involved in preparing and developeing LIMESTONE CREEK LOCAL FLOOD PROTECTION, FAYETTEVILLE, NY - MAIN REPORT & IMPACT STATEMENT - July 1984

1

Living at 110 Sims Place, Fayetteville, immediately adjoining Limestone Creeek, we are therefore most concerned with the proposed plans, as received.

Herewith comments, and suggestions :

Page EIS-22 3.39

South of Genesse St and Plaza bridges, and immediately to the north, the flow is rapid, the channel narrow and shallow.

2

I find no recognition of this part of the Creek as being:

1. very shallow, in ordinary circumstances
2. very narrow
3. The botton has a super-abundance of stones of various sizes, which could easily (?) be removed to give more capacity to the channel

EA-H-19

3.42 RE: Limited Channel Capacity (north of the State Dam, where the land is almost flat)

I have several suggestions to face and handle this problem:

Suggestion1: Behind the State Dam, there is an extensive pool, tosupply the Feeder Canal for the old Erie Barge Canal, no longer in use)
This is mentioned on Water Diversion, page 10, Building Constraints (1) Mention is made of moving or removing the 3 buildings on the East side of the Creek This suggestion will not effect these 3, or can be made integral in the moving or removal.

I sugrest that arrangements be made for this feeder pool, behind the Dam, be lowered up to one foot. This could be on a permanent basis, or with the threat or fact of an energency of a very heavy rainfall, or run-off.

3

Thereby, a subsubstatial part of the Dam run-over will be diverted to the Eastern channel to the Canal, away from creating real and pptentioal damage on the West, where is located the expansive flood plain, with so many homes and businesses.

In my judgment, from seeing the Creek for 6 years, this temporary diversion will NOT jeopardize the fishing situation below the Dam, because the limited "daoughts" - shortages of rain, below the Dam there is hardly 6 inches of water, I assume that this is not sufficient to maintain the trout. There always would be sufficient water for trout, south (behind the Dam).

SUGGESTION #2

4

There is sufficientspece, especially on the East side, toremove the bank(s) of the Creek, with its rip-rack - back by up to ten feet on both sides.

Father Prescott L. Laundrie — Comments Received: 13 Aug 84

1. Thank you for your review and comments. We understand your concern, yet believe, based on overall evaluation and considerations that the levee/floodwall plan is the preferred plan. Further response and explanation to your comments follow. Hopefully, these will alleviate most of your concerns.

2. The paragraph (EIS-22, 3.39) is intended primarily to generally describe the transition in creek gradient which occurs in the Fayetteville Village area. Paragraph 3.40 generally describes the floodplain areas in the project vicinity indicating relatively lower banks or shallower streambed in those areas. The stream bed is relatively narrow. The stream bed has an abundance of stone, however; removal is not easy and is not believed to be beneficial. First, the stream bed would probably return to similar to existing conditions soon after removal because of the scouring and movement of stone in the creek. Channelization would not be substantially effective in the area without removal of the dam. And, channelization would adversely affect the aquatic and fisheries habitat in the creek.

3. Reference the alternative developeent and plan selection portions of the DPR and EIS.

Suggestion 1. As indicated on page 10 of the DPR, NYSDOT and the Corps need to maintain the dam facility and operation. This has been identified as a planning constraint. It appears that your suggestion would serve as both a reservoir and diversion measure. These measures are considered in plan formulation. Although your suggestion could be somewhat effective during low to medium flow levels, it would provide limited reservoir and diversion capacities and would be sutstantially in-effective during critical high flow (flooding) periods.

In 1983, the New York State Department of Environmental Conservation reported collection of common shiner and wild brown trout young-of-year below the ferder dam. A few other instances have also identified salmonid (trout) species to be present north of the feeder dam.

4. Suggestion 2. Channelization measures were considered in plan formulation. There are a number of reasons why this measure was not selected over alternative measures. Channelization would not be compatible/effective if the dam structure is to remain intact. Potential impacts to bridge and dam foundation, reconstruction, and added costs were of concern. Channelization would substantially disrupt good aquatic, fishery, and riparian habitats in and along the creek. Work along substantial portions of both banks could increase overall project costs. Reference page EIS-5 paragraph 2.10 also.

SUGGESTION #3

As a former Rhode Islander, I have seen dredging of Providece harbor up to 25 feet in depth.

5 The situation here on Limestone Creek, since the 4-1/2 feet (?) dredging has substantially increased its capacity below the Dam, Until the present, it has proved adequate, but we have NOT had a 2-1/2 inch fall of rain in a limilted time, as in October 1981.

I suggest that the center of the Creek, especially below the Dam be dredged another 5 to 10 feet, so as to avoid flooding of the plain with its many homes and to avoid threatening Fayetteville Hall.

A QUESTION

6 Note Figure 4, page 11. What provisions are planned to prevent the floodwaters from creeping around the south end of the Levee, extending the the drain from Fayetteville Hall?

This well can be a problem. What is the proposed solution?

Cordially, faithfully, respectfully yours

Prescott L. Laundrie

PR. PRESCOTT L. LAUNDRIE
110 SIMS PLACE (637-6435)
FAYETTEVILLE, N.Y. 13066

copies
Mayor of Fayetteville
Supervisor Town of Manlius
Senator H S Auer
Assemblyman H Miller
Governor M. Cuomo
Congressman George Hortley
Engineer of Onondaga County

EA-H-20

5. Suggestion 3. From the flooding perspecitve, the channel is in somewhat better condition than pre and immediately post "81" flood conditions. The level and dependability of existing flood protection, however, is very limited.

Reference previous responses 2 and 4. New dredging below the dam, in itself, could do some good but overall would not be substantially effective. It probably would not be incrementally justified as cost effective either. This is due in part because the majority of the flood damages occur upstream of this section of creek and because of the flooding characteristics of the flood plain. It's understood that substantial flood waters enter the flood plain through or over the existing levee in the southern project limited vicinity, (as occurred in 81). These waters flow through and flood the developed flood plain area and reenter the creek in the vicinity of the dam. This contributes to back water drainage problems also aggrevating flooding. With the proposed plan, the water would be contained within the stream channel by the improved levees and would not enter the flood plain from the southern project limit as it has and can presently. This would, in turn, minimize flooding due to back water and flood plain drainage (Fayetteville Hall drainage ditch).

6. As indicated in the previous response; with the proposed plan, flooding due to backwater and flood plain drainage (Fayetteville Hall drainage ditch) would be minimal. Reference Plate 4 in the Detailed Project Report. This plate illustrates the flood pool for the design 100-year flood event; a significant flood. The flood level in the Kennedy, Warner, and Sims Streets vicinity should be below first floor elevation. The flood elevation would be correspondingly less for more likely lesser flood events (ie., the 81 flood) and more removed from the developed area. A tie-back is not considered necessary or justifiable.

Reference Plate 1 in the Detailed Project Report. A tie-back levee (Plate 1) and several berm possibilities were initially considered in addressing this issue. These measures would also necessitate incorporation of a more complicated internal drainage system; increasing project costs. In final consideration, no such measures could be incrementally justified.

This was indicated on page 21, second paragraph of the Detailed Project Report.