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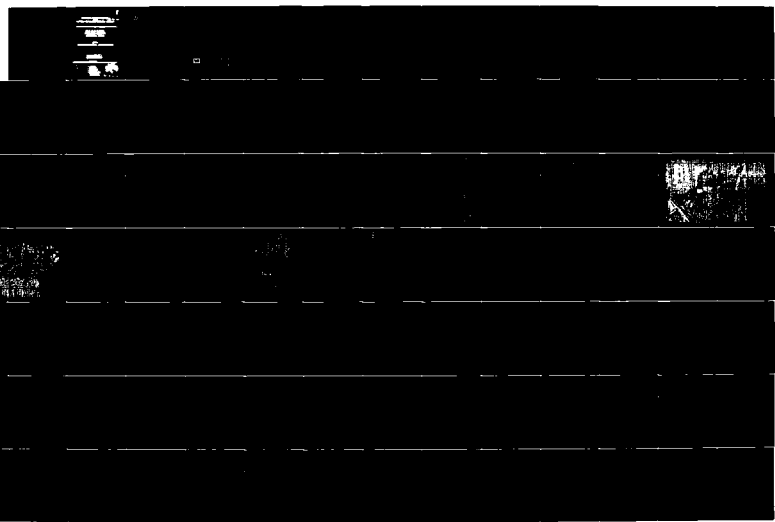
DETAILED PROJECT REPORT FOR SECTION 805 FLOOD CONTROL
PROJECT, DRY RUN PIPE TO ARMY ENGINEER DISTRICT ROCK
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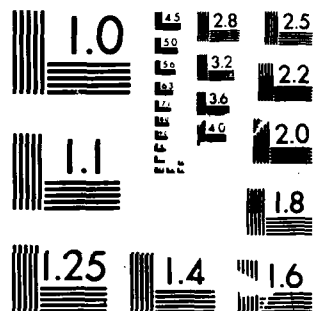
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DETAILED PROJECT REPORT
FOR
SECTION 205
FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

WITH
ENVIRONMENTAL ASSESSMENT

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JUNE 1987

ACKNOWLEDGEMENT

Many members of the Rock Island District assisted in the preparation of this report. Primary study team personnel who are familiar with the technical aspects of the study are listed below:

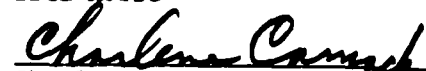
STUDY MANAGEMENT:


Roger Resser

SOCIAL AND ECONOMIC STUDIES:


Bill Morse

ENVIRONMENTAL/CULTURAL RESOURCES:


Charlene Carmack

HYDROLOGIC/HYDRAULIC STUDIES:


George Staley

DESIGN CONSULTANT:


Jerry Crittenden

REAL ESTATE STUDIES:


Elwin Yoder

DRAFTING AND ILLUSTRATING:


Dan Mason

GEOTECHNICAL STUDIES:


Barbara Lee



**US Army Corps
of Engineers**

Rock Island District

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OUR WORK**

SYLLABUS

↙
The city of Oelwein, Iowa, requested assistance from the Rock Island District, Corps of Engineers, to determine a solution for the flooding problems along a drainage ditch called Dry Run Creek within the city's corporate limits, under Section 205 of the 1948 Flood Control Act, as amended.

The Rock Island District completed a Reconnaissance Study of flooding problems along Dry Run Creek in the fall of 1985. The study concluded that it was in the Federal interest to conduct more detailed studies of flood damage reduction measures for Oelwein.

1 This Detailed Project Report presents the evaluation of alternative solutions to Oelwein's flooding problems. The report recommends the construction of a Channel Modification project which would produce annual net economic benefits of \$13,800, and has a benefit-to-cost ratio of 1.6 based upon a 50-year economic life and a discount rate of 8-5/8 percent. The estimated total construction cost is \$250,300, of which \$130,515 is a non-Federal cost. Environmental impacts of the project are not significant and are evaluated in the ~~attached~~ Environmental Assessment.

DETAILED PROJECT REPORT
FOR
SECTION 205
FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

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DETAILED PROJECT REPORT
FOR
SECTION 205
FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

SECTION 1 - INTRODUCTION

STUDY AUTHORITY

The authority for this report is Section 205 of the 1948 Flood Control Act, as amended. The authority, as amended, is presented below:

That the Secretary of the Army is hereby authorized to allot from any appropriations heretofore or hereafter made for flood control, not to exceed \$40,000,000 for any one fiscal year, for the construction of small projects for flood control and related purposes not specifically authorized by Congress, which come within the provisions of Section 1 of the Flood Control Act of June 22, 1936, when, in the opinion of the Chief of Engineers, such work is advisable. The amount allotted for a project shall be sufficient to complete Federal participation in the project. Not more than \$5,000,000 shall be allotted under this section for a project at any single locality. The provisions of local cooperation specified in Section 3 of the Flood Control Act of June 2, 1936, as amended, shall apply. The work shall be complete in itself and not commit the United States to any additional improvement to ensure its successful operation, except as may result from the normal procedure applying to projects authorized after submission of preliminary examination and survey reports.

STUDY PURPOSE AND SCOPE

The purpose of each water and related land resources project undertaken by the Corps of Engineers is to contribute to the public interest through National Economic Development (NED).

The selected plan to alleviate flooding problems along Dry Run Creek in Oelwein, Iowa, must be economically and engineeringly viable, environmentally sound, and within the public interest to implement.

STUDY AREA

Oelwein is located in southwestern Fayette County in northeastern Iowa, about 40 miles northeast of Waterloo (plate 1). The study area is Dry Run Creek and its drainage basin within the city limits of Oelwein. Dry Run Creek flows southwesterly through an intensely urbanized portion of the city before converging with Otter Creek downstream of the corporate limits (plate 2). The drainage area at the mouth of Dry Run Creek is 3.0 square miles. Although damages from flooding have occurred in Oelwein along Otter Creek, local officials indicate that the areas of primary concern with respect to flood damages lie along Dry Run Creek between Eighth Avenue NE. and the Chicago and Northwestern (C&NW) Railroad culvert.

TYPE, DEPTH, AND DETAIL OF INVESTIGATIONS

This Detailed Project Report is the final feasibility investigation under the study authority. Its goal is to accomplish the following objectives:

- a. Determination of the Federal interest and whether or not the study should proceed to plans and specifications, based on a detailed appraisal of costs, benefits, and environmental impacts.
- b. Completion of plan formulation by optimization of the selected plan using detailed engineering, economic, and environmental consideration of the design.
- c. An assessment of the level of support and the willingness of the local sponsor to share the cost of plans and specifications and project construction.

RELATED STUDIES AND REPORTS

The reports described below discuss aspects of the flood problems in Oelwein and are listed in order of publication.

Preliminary Storm Damage Survey, Oelwein, Iowa, 1979. This survey was conducted by Bert B. Hanson and Associates (now Jensen, Cary, and Shoff), consulting engineers in Cedar Falls, Iowa. Their report includes the results of a storm damage survey of public facilities in Oelwein conducted after a very severe storm in August 1979. They estimated a total of \$305,550 in damages to public property due to the storm and resultant flood.

Storm Sewer Study, Oelwein, Iowa, 1981. The firm of Associated Engineers, Inc., Cedar Rapids, Iowa, was asked by the city of Oelwein to investigate the storm drainage systems in Oelwein. As a result of their investigation, Associated Engineers identified the area between the upstream corporate limits and the C&NW Railroad as presenting the most serious flood problem. They reported that since 80 percent of the contributing watershed is outside the Oelwein corporate limits, runoff control outside the city is necessary to alleviate the flood problem within the city. Flood control measures suggested in this report are: a detention basin located upstream of Eighth Avenue NE. immediately north of Wing's Elementary School, surface water interception and diversion, and soil stabilization techniques. The report recommended that some combination of the above runoff and flood control measures be implemented before additional development is permitted.

Flood Study Report, Dry Run, Oelwein, Iowa, 1982. This report was published by the Soil Conservation Service in Des Moines, Iowa. It delineates the 100-year floodplain for a 1.4-mile reach of Oelwein between Second Avenue SW. on the lower end to a point one-third of a mile upstream of Eighth Avenue NE. on the upper end. The 100-year flood profile, selected valley cross sections, flood frequency-elevation discharge data, and other flood data are included in this report. Alternatives suggested for flood damage abatement in Oelwein are: channel improvement, tile outlet terraces installed upstream of East Line Road, and a floodwater storage basin upstream of Eighth Avenue NE.

Initial Appraisal, City of Oelwein, Fayette County, Iowa, September 1983. This report, prepared by the Rock Island District, Corps of Engineers, concluded that it was in the Federal interest to conduct more detailed studies of flood damage reduction measures at Oelwein.

Reconnaissance Report, Dry Run Creek, Fayette County, Oelwein, Iowa, August 1985. This report, prepared by the Rock Island District, Corps of Engineers, concluded that a channel modification project was economically justified and recommended further analysis in the form of a Detailed Project Study.

SECTION 2 - PLAN FORMULATION

ASSESSMENT OF WATER AND LAND RESOURCES, PROBLEMS, AND OPPORTUNITIES

PROBLEMS, NEEDS, AND OPPORTUNITIES

Residents, businessmen, and community leaders have expressed their concern about the problem of overbank flooding from Dry Run Creek and the resulting damage to homes, businesses, and public facilities. They feel they need to take action to minimize future flooding damages and to lower future flood levels on Dry Run Creek.

The Dry Run Creek floodplain between Eighth Avenue NE. and the C&NW Railroad culvert suffers the most significant damages during floods. Plate 3 shows the limits of flooding attributable to the 10-year flood (10 percent chance of being equalled or exceeded in any given year) and 100-year flood (1 percent chance of being equalled or exceeded in any given year). Eight bridges or culverts span the creek in this area. Most of these bridges and culverts are overtopped by floodwater when flows reach the 100-year flood level. Many of the bridges obstruct flow at the 10-year flood level. Plate A-4 of appendix A displays water surface levels for the 10- and 100-year floods, along with the 2-year and 50-year floods and the Standard Project Flood (SPF) under existing conditions (including the Iowa Department of Transportation's bridge replacement at First Avenue NE., which was constructed in 1986, and assuming the bridge replacement at Frederick Avenue, scheduled for construction in 1988).

The restrictive bridges, coupled with high velocities, were contributing factors in the damaging flood experienced by Oelwein on 28 August 1979. The flood, which was estimated to be greater than a 50-year flood (2 percent chance of occurring in any given year), followed a storm in which 4.25 inches of rain fell in a period of about 1 hour. Similarly, on 22 June 1984, an estimated rainfall of 2.52 inches fell in a period of less than 30 minutes, producing a flood estimated to be a 25-year flood (4 percent chance of occurring in any given year). Minor flooding, necessitating traffic detours, occurs nearly every year in Oelwein.

The total damages attributed to the flood of August 1979 are estimated at \$762,000. Correspondingly, a figure of \$373,000 represents the estimate of total damages caused by the June 1984 flood which affected 13 homes and 25 businesses.

EXISTING CONDITIONS

Hydrologic and Hydraulic Conditions

Dry Run Creek is a principal drainage outlet for the central portion of the city of Oelwein. It forms in the northeastern part of the city where the runoff from 900 acres of farmland converges (plate 2). The flow path is generally southwestward through the city to its confluence with Otter Creek. Average watershed slopes are between 2 and 3 percent; the drainage area encompasses 3.0 square miles. Watershed soils have moderate water infiltration and transmission characteristics. Land use in the watershed is about 50 percent urban and 50 percent agricultural. Storm sewers, street gutters, and minor surface channels collect and convey runoff waters to the main stem of Dry Run Creek. This urban contribution appears to be the primary cause of flooding in Oelwein.

Environmental Setting and Natural Resources

The study area is primarily urban in character. The upstream area is scattered single-family residential and the drainage is aesthetically pleasing, with well-vegetated banks and a natural appearance to the channel. As the drainage courses further downstream through the city, the watershed becomes more densely urban and commercial near the center of the city where the channel is modified and takes on the appearance of a ditch. Near the downstream end of the study area, the drainage passes under the C&NW Railroad tracks into an industrial area. In the industrial area, filter and skimming devices have been stretched across the channel in an apparent attempt to filter or trap effluents which have entered the channel. Because of the urban character of most of the drainage area, its natural resource value is limited.

The northern wild monkshood (*Aconitum noveboracense*) is the only federally listed species for Fayette County and has a "threatened" status. The habitat requirements of the monkshood are generally described as north or east facing, shady slopes. These habitat conditions do not exist in the study area; consequently, the northern wild monkshood is not anticipated to be found in the area.

Following review of Special Reports 1 through 4 of the Iowa State Preserves Advisory Board and considering existing conditions in the study area (i.e., limited habitat, urban conditions, stream quality, and general disturbance), the potential for occurrence of any State-listed endangered species may be considered negligible.

Human Resources, Development, and Economy

Oelwein's population declined between 1960 and 1980, leaving it with a 1980 population of 7,564. The city has historically depended on the railroads for employment opportunities, but the merger of the Chicago Great Western Railroad with the C&NW Railroad reduced the number of city residents employed by the railroad. Local agricultural-related industries have since become a major source of employment.

In spite of the present decline in employment opportunities in Oelwein, local industry and business leaders remain optimistic about the city's future growth.

Based on an existing conditions frequency-damage analysis (appendix B), average annual damages due to flooding in Oelwein are approximately \$71,900.

FUTURE CONDITIONS

Without a Flood Control Project

Without a flood control project, Oelwein will continue to be susceptible to flooding and resultant damages to private and public property. However, based on projected future urban growth (appendix B, section 5), the severity of Oelwein's present flood problem should not be intensified by increased runoff of rainwater associated with urban development.

With a Flood Control Project

With a flood control project, Oelwein's residents will be spared the social and financial hardships associated with frequent flooding. Residents will spend less time and money to clean up and perform repairs after flooding.

PLANNING OBJECTIVES

NATIONAL OBJECTIVE

The national objective of water and related land resources planning is to contribute to economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to National Economic Development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are direct net benefits and costs that accrue in the planning area and the rest of the Nation. Such contributions include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed.

The plan formulation process to accomplish flood damage reduction is formulated and directed by the national planning objective:

- * National Economic Development (NED) - To enhance the national economic development by increasing the value of the Nation's output of goods and services and by improving the national economic efficiency.

SPECIFIC OBJECTIVE WITHIN STUDY AREA

The specific planning objective for this study is as follows:

- * To reduce the flood-related economic losses sustained by residents, businesses, industries, and public concerns along Dry Run Creek within the city of Oelwein, Iowa.

PLANNING CONSTRAINTS

The planning process provides the basis for selecting one of the developed plans and, if appropriate, recommending Federal participation to implement the plan. The selected plan is the one that is in the best public interest regardless of whether or not it is within the existing authority of the Corps to implement.

The planning constraints which have been developed for this study are as follows:

- * This study is constrained by applicable laws of the United States and by the State of Iowa, all Executive Orders of the President, the Water Resources Council's Principles and Guidelines, and all engineering regulations of the Corps of Engineers.
- * This study is constrained to formulate plans that are socially acceptable. Conversations with residents indicated that plans which are disruptive to Oelwein's central downtown business district and its established infrastructure would be unacceptable.

ALTERNATIVE PLANS

AVAILABLE MEASURES

Available measures for the development of alternative plans were considered to be those measures, both structural and nonstructural, which could be constructed in compliance with existing statutes, administrative regulations, and established common law.

DEVELOPMENT OF ALTERNATIVE PLANS

To assist in the preliminary evaluation of the following alternatives, costs were annualized and then compared to the total average annual damages. The total average annual damages are the calculated average annualized damages

that are expected to occur from all possible flood events. Therefore, if a project's total annual costs meet or exceed the total average annual damages, the resulting benefit-to-cost ratio would be significantly less than 1. Hence, in the preliminary evaluation of alternative plans, if annual costs exceeded the total average annual damages of \$71,900, the alternative was deemed economically infeasible and dropped from further analysis. (See appendix B.)

NONSTRUCTURAL ALTERNATIVES

Floodproofing

Description

Floodproofing is a combination of structural changes and adjustments to properties subject to flooding used primarily to reduce or eliminate flood damage. This alternative involves raising existing structures or future structures above flood heights or providing panels that can be placed over building doors and windows. Although it is more simply and economically applied to new construction, floodproofing is also applicable to existing structures.

Preliminary Evaluation

Raising existing commercial and industrial structures above flood heights would yield annual costs greatly in excess of the total annual damages considering the heavy construction of the buildings. Also, problems of access to buildings and homes would be created by raising these structures.

Placing panels over doors and windows is a viable solution where there is adequate warning time prior to flooding. However, most flooding is caused by intense storms in which the peak runoff occurs in approximately 2 hours (see plate A-6 of appendix A). With such a limited time to respond, it is unlikely that temporary floodproofing measures could be sufficiently implemented to significantly reduce damages. Hence, this alternative was dropped from further analysis.

Flood Forecasting and Flood-Warning Systems

Description

Flood Forecasting System. The National Oceanic and Atmospheric Administration (NOAA) issues warnings of potential flood-producing storms. Frequently, the flood warnings are preceded by a "severe weather

or flood watch." The flood warnings and statements on flood conditions are transmitted to city officials as well as to newspapers and radio and television stations in the area. The services available include flash flood warnings and major flood forecasts based on radar coverage, numerous rainfall reporting stations, river gages, anticipated weather conditions, and hydraulic factors.

Flood-Warning System. A flood-warning system is a water level sensing device or devices which are connected to an alarm. As water levels rise and reach a potentially threatening level, the alarm is activated. These systems provide increased safety to area residents by furnishing evacuation time.

Preliminary Evaluation

The physical characteristics of Dry Run Creek and its watershed are such that the value of flood forecasting and flood warning are greatly reduced. As stated earlier, the runoff hydrograph reaches its peak within 2 hours (plate A-6). With such a limited time available in which to respond, few damages would be prevented with a flood-warning system. Hence, this alternative was not pursued.

Evacuation and Relocation

Description

Permanent evacuation and relocation of the residents and structures in the Dry Run Creek floodplain in Oelwein would require removal and relocation of all structures currently within the areas which are susceptible to flooding.

Preliminary Evaluation

With about 60 homes and 30 businesses in the 100-year floodplain, the annual cost associated with purchasing all the structures would be significantly greater than \$71,900. Removal of these buildings, especially the businesses, would disrupt the central downtown business district and its established infrastructure. Although the cost of such a disruption is intangible, conversations with Oelwein residents indicate that it would carry a very high cost.

Also considered was removal of all the structures that would be damaged by a flood of similar magnitude to the 1984 flood. Of the 25 businesses that would be inundated, all are of heavy construction (brick, concrete block, steel, etc.). Evacuation or relocation costs would greatly exceed

the average annual damages for these buildings. Also, 13 homes would be inundated by this flood. With annual evacuation/relocation costs of \$36,000 and annual benefits of \$8,000, the resulting benefit-to-cost ratio for evacuating or relocating these homes is about 0.2. Consequently, total evacuation and relocation and less comprehensive versions of this alternative were not pursued.

STRUCTURAL ALTERNATIVES

Upstream Floodwater Storage Basin

Description

This alternative evaluated the potential for detention of floodwater in an upstream storage basin. Design of the storage basin would consist of an earthen embankment to detain floodflows with an outlet structure to allow passage of flows up to the capacity of the downstream channel. The storage basin would be dry until flow exceeded the capacity of the outlet structure.

Preliminary Evaluation

Based on topographic mapping, three sites were selected for analysis as having the most natural storage potential. These sites, each located upstream of East Line Road, would have the potential to store floodwaters up to a 10-year occurrence (a 10-year flood).

The annual cost of an embankment detention structure of a very simplistic design for the smallest of these three sites is \$83,000. An upstream floodwater storage basin of this magnitude is economically infeasible and was eliminated from further consideration.

Concrete Floodwall

Description

This alternative consists of a concrete floodwall on both sides of Dry Run Creek within the flood problem area (plate 3) and appropriate closure structures for each opening in the walls. Riverfront property would be acquired to construct this alternative.

Preliminary Evaluation

A concrete floodwall designed to protect Oelwein from a 100-year flood could be constructed at an annual cost of about \$200,000. Somewhat less expensive floodwalls offering lower levels of protection could be constructed, but all floodwalls through Oelwein would require the same number of street closures and pump stations. These items account for over 50 percent of the cost of the 100-year floodwall.

For the 50-year level of protection, annual costs would exceed \$150,000. Hence, this alternative was eliminated from further consideration.

Levees and Floodwalls

Description

This alternative consists of an integrated system of levees and floodwalls aligned along both sides of Dry Run Creek, through the flood problem area (plate 3). Levees would be constructed of earthen embankment with an 8-foot top width and 1 on 3 side slopes. Floodwalls would be made of concrete and constructed where structures limit right-of-way necessary for levee construction. Riverfront property would be acquired, and appropriate closure structures would be constructed where major thoroughfares intersect the levee or floodwall alignment.

Preliminary Evaluation

With annual costs of \$200,000 and \$139,000 for the 100- and 50-year levels of protection, respectively, and annual damages of \$71,900, the resulting benefit-to-cost ratios would be much less than unity. Consequently, levees and floodwalls were not considered for further analysis.

Earthen Levee

Description

This alternative consists of levees, as described in the previous alternative, aligned along both sides of the channel through the flood problem area (plate 3). However, contrary to the previous alternative, structures that encroach on right-of-way necessary for construction would be acquired and removed from the project alignment.

Preliminary Evaluation

The annual cost of a levee system built to 50-year level of protection exceeds \$80,000. Hence, the preliminary benefit-to-cost ratio is 0.9. Therefore, this alternative was not considered further.

Excavated Pit Storage Basin

Description

An excavated pit storage basin was evaluated for storing floodwaters. Flows greater than a 2-year flood (assumed existing channel capacity) up to the design capacity would be diverted to and stored in the pit. The floodwater would be stored until the flood subsides and then pumped out of the pit and back into the channel at a rate which the channel could safely convey.

Preliminary Analysis

A 5-year flood design excavated pit was analyzed. The volume of storage necessary is approximately 132 acre-feet, corresponding to a minimum of 213,000 cubic yards of excavation (based on flat topography). Hence, the annualized project costs far outweigh the total annual damages. Therefore, this alternative was dropped from further consideration.

Concrete-Lined Widened Rectangular Channel

Description

This alternative evaluated a channel widened to a 40-foot bottom width, with vertical concrete retaining walls. This size channel would be capable of passing a 100-year flood with 1 foot of freeboard.

Preliminary Evaluation

The annual cost of such an alternative would be in excess of \$134,000. The cost of a 20-foot-wide channel of similar design is still greater than the total annual damages. Hence, this alternative was dropped from further consideration.

Railroad Culvert Modification

Description

When the flows of Dry Run Creek approach a level somewhere between those associated with the 5- and 10-year flood events, a backwater effect is created by the twin box culvert under the C&NW Railroad tracks near Second Avenue SW. This backwater effect extends upstream to a commercial business parking lot located between First Avenue NW. and North Frederick Avenue. Modification of this restriction by constructing a third culvert similar in size to the two already in place would delay the creation of a backwater effect until flows reach the level of approximately the 100-year flood.

Preliminary Evaluation

This alternative would reduce flood damages in the area between the C&NW Railroad tracks and the parking lot, but would have little effect on areas farther upstream. It would not reduce the force of the floodwater upstream and might actually increase the force downstream and induce damages in southwest Oelwein by permitting a free flow of water.

According to a preliminary analysis of this alternative, the culvert under the C&NW Railroad tracks could be made less restrictive at an annual cost of approximately \$25,000. Benefits from this expenditure would accrue only in the area immediately upstream of the culvert, reaches 2 and 3 (appendix B, plate B-1). The annual damages in those reaches would be \$20,000. Therefore, the resulting benefit-to-cost ratio would be less than unity, and this alternative was not considered further.

Channel Modification

Description

Without modifying many of the bridges spanning Dry Run Creek, there would be little benefit in enlarging the channel to greater than a 20-foot bottom width. Annual costs associated with raising, replacing, or enlarging the bridges to provide greater channel capacities were found to be much greater than the total annual damages of \$71,900. Also, enlarging the channel to a capacity less than that of the bridges was not considered to be cost effective. Hence, it was determined that the optimal Channel Modification project would involve widening the channel to the capacity of the existing bridges.

Channel modification would involve clearing the channel of debris, realigning and widening the channel bottom, and reshaping the channel side slopes. The channel bottom would be widened to a 20-foot width and the

side slopes would be reshaped to a 1V on 2H slope (plate 4). The modified channel will be slightly realigned such that the project right-of-way will not necessitate any residential, commercial, or industrial relocations. Channel modifications would begin just downstream of Third Street NE. and end at the upstream side of the C&NW Railroad culvert (plates 5 and 6).

Preliminary Evaluation

A preliminary analysis indicates channel modification to have an annual cost of \$24,500, which is significantly less than the total annual damages of \$71,900. Hence, channel modification was analyzed in greater detail.

Combination of Alternatives

Description

Since reaches 6 and 7 (appendix B, plate B-1) suffer a good percentage of the damages during flooding, a combination of channel modification and levee construction was analyzed for these areas.

Preliminary Evaluation

Benefit-to-cost ratios for this alternative were significantly less than unity for a 10-year level of protection. Higher levels of protection would have revealed annual costs greater than annual damages for these individual reaches. Therefore, this alternative was not considered further.

EVALUATION OF ALTERNATIVE PLANS

Based on a preliminary evaluation of effectiveness and acceptance, channel modification was evaluated in greater detail. The plan is evaluated below.

CHANNEL MODIFICATION

The Channel Modification plan would reduce damages by 13 percent for a 50-year event (1979 flood) and by 46 percent for a 25-year event (1984 flood). The Channel Modification plan would reduce the stage of floods, up to a 50-year frequency event, by 0.5 to 1.5 feet (as shown on plates 7, 8, and 9). Overall, the average annual damages would be reduced by 46 percent, but damages from flooding would still occur with this plan. Although minimal, these damages would occur between a 1- to 2-year frequency event.

The total first cost of this plan is \$250,300, with a benefit-to-cost ratio of 1.7 and annual net benefits of \$13,800. Detailed cost estimates of this plan are listed on tables 1 and 2.

It should be noted that this Channel Modification plan is optimized. Enlarging the channel to greater than a 20-foot bottom width would exceed the capacity of the existing bridges. A smaller channel would not utilize the capacity of the bridges. Hence, economic optimization is inherent in the design of this plan.

TABLE 1

Cost Estimate - Channel Modification

<u>Channel Modification Component</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price (\$)</u>	<u>Federal Cost (\$)</u>	<u>Non-Federal Cost (\$)</u>
Tree Removal	Ac	0.2	4,800	960	
Clear & Grub	Ac	0.9	1,500	1,350	
Seeding	Ac	4.7	1,800	8,460	
Excavation/Spoil	yd ³	4,840	8	38,720	
Riprap	Ton	790	20	15,800	
Guard Rail	LF	650	20	13,000	
Utility Pole Reloc.	Item	12	500		6,000

TABLE 2

Cost Estimate - Channel Modification

<u>Cost Summary Component</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price (\$)</u>	<u>Federal Cost (\$)</u>	<u>Non-Federal Cost (\$)</u>
Subtotal of Construction Costs				78,300	6,000
Contingencies	(%)	20		<u>15,700</u>	<u>1,200</u>
Total Construction Cost				94,000	7,200
E & D				32,000	800
S & A	(%)	7		6,300	N/A
Lands and Damages, Relocation Asst., Cost of Acquisition, and Contingencies	1	Job	Sum	<u>0</u>	<u>110,000</u>
Subtotal				132,300	118,000
Total Combined Project Cost (\$250,300)					
5% Non-Federal Cash Contribution				<u>-12,515</u>	<u>+12,515</u>
Total First Cost (Cost-Sharing w/LERR >20%)				119,785	130,515
Reimbursement of Costs >50%				<u>+5,365</u>	<u>-5,365</u>
Final Project Costs				<u>125,150</u>	<u>125,150</u>
Annual Operation and Maintenance					1,600

CONCLUSION

Various structural and nonstructural measures, along with a No Federal Action plan, were considered to alleviate the flooding problem along Dry Run Creek in Oelwein, Iowa. A screening methodology was applied to the various measures to produce logical alternatives for evaluation and plan selection.

Based on NED criteria, Channel Modification is the selected plan. Various social and environmental factors are evaluated in both appendix B and the Environmental Assessment in support of this conclusion.

Although the Channel Modification plan provides significant economic benefits, flooding will still occur rather frequently. Water surface profiles for most flood events are generally reduced by less than 1 foot (see plates 7, 8, and 9 or compare plates A-4 and A-5, appendix A), and residual damages are relatively high (54%) with the Channel Modification plan. Overbank flooding would occur for floods greater than the 2-year event (plate 7) in some reaches. Hence, over time, the stage reduction effect of the project may not be perceived as significant by some property owners.

PRESENTATION OF FINAL ARRAY OF PLANS

The Channel Modification plan is environmentally sound and economically justifiable. Based on a detailed analysis of net benefits, Channel Modification is the NED plan. This plan maximizes net benefits, as described in appendix B.

SECTION 3 - DESCRIPTION OF THE SELECTED PLAN

INTRODUCTION

Based on economic, environmental, and social considerations previously described, the selected plan is the Channel Modification plan.

PLAN COMPONENTS

GENERAL

The selected plan of Channel Modification consists of approximately 3,500 lineal feet of channel improvement. Project layout and details of the selected plan are revealed on plates 4 through 6 and described in the paragraphs that follow.

The Channel Modification project would involve clearing the channel of debris, realigning and widening the channel bottom, and reshaping the channel side slopes. The channel bottom would be realigned and widened to a 20-foot width (plate 4) such that the project's right-of-way will not necessitate any residential, commercial, or industrial relocations.

The project would begin just upstream of the C&NW Railroad culvert (plate 5) and end at the downstream side of Third Street NE. (plate 6).

Components of the Channel Modification project include 0.9 acre of clearing and grubbing, 0.2 acre of tree removal, 4,840 yd³ of excavation and spoil, 4.7 acres of seeding, and 790 tons of riprap to line the channel. These components are listed on the project cost estimate, table 1.

REAL ESTATE REQUIREMENTS

For this Channel Modification project, it is estimated the city will acquire permanent easements for channel improvements and maintenance (4.1 acres). A temporary easement will be required for spoil disposal (0.6 acre). The lands affected by the project are primarily residential and commercial. The cost of right-of-way and acquisition is currently estimated at \$110,000.

BEAUTIFICATION

Revegetation, an integral part of the beautification process, includes the seeding of all areas within the project right-of-way limits. In general, visibly disturbed areas within the project right-of-way will be landscaped to provide an aesthetically pleasing appearance.

DESIGN AND CONSTRUCTION CONSIDERATIONS

The Channel Modification project would involve excavating approximately 4,840 yd³ of material from the channel. This material would be hauled and spoiled at the site proposed on plate 10. Areas of the channel which are modified or disturbed by construction equipment would be seeded. To reduce the potential for erosion, riprap or grass pavers will be placed to 500 lineal feet downstream of the Frederick Avenue bridge (plate 5) and to 100 lineal feet downstream of the Second Street/Third Avenue bridge (plate 6). In developing plans and specifications, design engineers will determine if grass pavers should be used in place of riprap. Grass pavers may beautify the channel and allow safer access to and from the water's edge. The channel bottom slope, or "thalweg," would not be altered by project construction, as shown on plates A-4 and A-5.

A permanent right-of-way, which would extend to 10 feet on either side of the improved channel, would be required for construction and operation and maintenance.

GEOTECHNICAL CONSIDERATIONS

A geotechnical analysis of the selected plan was conducted and is included as appendix C. The analysis concludes that geotechnical considerations such as depth to bedrock, groundwater, and channel slope stability should not present a problem during project construction.

SCHEDULE

Plans and specifications are scheduled to be completed in the fall of 1987, and, assuming appropriation of funds, construction could begin as early as 1988 and require about 7 months to complete.

OPERATION AND MAINTENANCE CONSIDERATIONS

Assurance would be obtained from the city of Oelwein that it would maintain and operate the completed works in accordance with the requirements of the Secretary of the Army.

The project would be transferred to the city for operation and maintenance after completion. Subsequent to completion, an operation and maintenance manual would be completed by the Rock Island District, Corps of Engineers, and furnished to the city which would be assigned the responsibility for operation and maintenance.

Grassed channels should be mowed once a year (in September) to prevent trees and brush from restricting channel capacity. Riprap sections may require replacement after flood events. It may be necessary to annually clear bridge openings which may be restricted due to sedimentation.

PLAN ACCOMPLISHMENTS

The selected plan accomplishes the major planning objectives. The structural elements of the plan will provide an economically feasible and socially acceptable method of reducing flood damages. The plan will allow preservation and enhancement of existing open space and limited wildlife habitat to the extent possible. Major economic benefits that would result from the selected plan would be the reduction of existing and future flood damages. The major social benefit of the plan is a reduction in the mental anxieties of the residents as a result of the reduction of flood potential. Environmental values will be maintained to a major extent.

ECONOMIC CONSIDERATIONS

Cost estimates for the selected plan include costs for engineering, design, supervision, and administration and a 20 percent contingency factor. The period of analysis for the plan was selected as 50 years. Interest and amortization changes are based on a discount rate of 8-5/8 percent. The estimated first costs of the selected plan are summarized in table 3 and the annual costs are summarized in table 4.

ENVIRONMENTAL CONSIDERATIONS

The attached Environmental Assessment concludes that the selected plan for channel modification would have no significant environmental or cultural resource impacts.

TABLE 3

Summary of First Costs
Channel Modification Project

<u>Item</u>	<u>Amount(\$)</u>	
	<u>Federal</u>	<u>Non-Federal</u>
Construction of Channel Modifications	94,000	7,200
Engineering and Design	32,000	800
Supervision and Administration	6,300	-
Lands and Damages (Value of Land, Relocation Assistance, and Cost of Acquisition)	-	110,000
FIRST COST <u>a/</u>	132,300	118,000
NON-FEDERAL CASH CONTRIBUTION (5%)	<u>-12,515</u>	<u>+12,515</u>
TOTAL FIRST COST (COST-SHARING)	119,785	130,515
COMBINED FEDERAL AND NON-FEDERAL FIRST COSTS		<u>250,300</u>

NOTE: Figures include 20 percent contingencies.

a/ Assumes only Lands, Easements, Right-of-Way, and Relocations (LERR) as a non-Federal cost.

TABLE 4

Summary of Annual Costs
Channel Modification Project

<u>Description</u>	<u>Amount (\$)</u>	<u>Annual Cost (\$)</u>
Estimated First Cost	250,300	
Interest During Construction	<u>10,800</u>	
TOTAL FIRST COSTS	261,100	
Interest and Amortization (.08765)		22,900
Operation and Maintenance		<u>1,600</u>
TOTAL ANNUAL CHARGES		24,500

NOTE: Figures include 20 percent contingencies.

SECTION 4 - PLAN IMPLEMENTATION

INSTITUTIONAL REQUIREMENTS

Before construction of the selected plan, the following steps must be completed:

* After funding is initiated, detailed design plans, specifications, and an engineering estimate are prepared by the District Engineer. Bids are then solicited and a construction contract awarded. Local action is implemented during this same time.

* Following construction of the project, local interests assume responsibility for operation and maintenance.

IMPLEMENTATION RESPONSIBILITIES

Federal and non-Federal responsibilities and cost apportionment policies concerning construction and operation and maintenance for federally constructed projects have been set out by legislative and administrative guidance.

This action presents the pertinent information regarding the cost apportionment and Federal and non-Federal responsibilities involved in the construction of a local flood protection project for Oelwein, Iowa.

FEDERAL RESPONSIBILITIES

The Federal Government will design and construct the various features of the protection works. The work generally charged as a Federal cost includes that for the channel improvements.

Recently, the Congress and the Administration passed the Water Resources Development Act of 1986, Public Law 99-662 (PL 99-662). Public Law 99-662 requires project cost-sharing and financing across the entire spectrum of water resource development functions. The basic principle governing the development of specific cost-sharing policies is that, whenever possible, the cost of services produced by water projects should be paid by their direct beneficiaries. It is also recognized that the Federal Government can no longer bear the major portion of the financing of water resource projects. New sources of financing, both public and private, will have to be found.

Specific policies concerning the Oelwein project have been established. The cost-sharing formulas applicable to flood control projects are summarized in table 5.

TABLE 5

Cost-Sharing & Financing Requirements

as Contained in

The Water Resources Development Act of 1986 (PL 99-662)

17 November 1986

Project Purpose	Cost of Construction Participation		Non-Fed Financing		Responsibility LERR Lands, Easements ROW, Relocations	O&M
	Fed	Non-Fed	Cash	Amortize (1)		
Flood Control (including LERR)						
• Local Protection						
• LERR > 20%	TBD	LERR + 5% (1)(2)	5%	None	non-Fed	non-Fed
• LERR < 20%	75%	25% (1)	5%	None	non-Fed	non-Fed
• LERR < 20%	65%	35% (1)	5%	30% less LERR	non-Fed	non-Fed

1/ Credit can be given for value of lands, easement, ROW, dredged material disposal areas, and relocations acquired or accomplished by non-Fed's.

2/ Non-Federal sponsor will not pay more than 50% of the total project cost.

At Oelwein, the cost of Lands, Easements, Right-of-Way, and Relocations (LERR) is \$118,000 (table 3). This amount is greater than 20 percent of the combined total first cost of \$250,300. Thus, as shown on table 5, the non-Federal share of the construction cost would be the LERR plus 5 percent of the total cost, or \$130,515. The Federal first cost is \$119,785. The Government will refund to the city the value of any LERR which exceeds 45 percent of the total project costs, such refund currently being estimated at \$5,365.

NON-FEDERAL RESPONSIBILITIES

The estimated total first cost (Federal and non-Federal costs) of this project is estimated at \$250,300. In accordance with the cost-sharing policies of Congress and the Administration, the city must pay a minimum of 25 percent (\$62,575) of the total project costs, with at least 5 percent thereof being in the form of a cash payment. Based on the value of rights-of-way and other items, however, it is estimated that the city's cost will be approximately \$130,515. In this connection, prior to the start of construction, and in accordance with Section 221 of Public Law 91-611, the city must enter into a written agreement with the United States that it will:

- a. Provide without cost to the Government all lands, easements, and rights-of-way, including suitable borrow and dredged material disposal areas, as may be determined by the Chief of Engineers to be necessary for construction and maintenance of the project, currently estimated at \$110,000.
- b. Hold and save the Government free from all damages arising from the construction, operation, and maintenance of the completed project, except for damages due to the fault or negligence of the Government or its contractors.
- c. Operate, maintain, and rehabilitate the project upon completion in accordance with regulations or directions prescribed by the Secretary of the Army.
- d. Accomplish without cost to the Government all alterations and relocations of buildings, streets, storm drains, utilities, highway bridges, and other structures and improvements made necessary by construction of the project, currently estimated at \$8,000.
- e. Prevent encroachment on any of the flood protection structures, including the ponding areas, and if ponding areas are impaired, provide substitute storage capacity or equivalent pumping capacity promptly without cost to the Government.
- f. 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 operation and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

g. Provide a minimum of 25 percent of the total project costs, with not less than 5 percent (currently estimated at \$12,515) of total project costs to be in the form of a cash payment.

h. Contribute all project costs in excess of the Federal statutory limitation of \$5,000,000.

i. Publicize floodplain information in the areas concerned and provide this information to zoning and other regulatory agencies for their guidance and leadership in preventing unwise future development in the floodplain and in adopting such regulations as may be necessary to ensure compatibility between future development and protection levels provided by the project.

j. At least annually, notify persons in the affected area that the project will not provide complete protection.

k. Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (P.L. 88-352) 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.

The Agreement also will grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the city owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, repairing, and maintaining the project. If an inspection shows that the city for any reason is failing to complete, operate, repair, and maintain the project in accordance with the assurances hereunder, the Government will send a written notice to the city. If the city persists in such failure for 30 calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon lands the city owns or controls for access to the project for the purpose of completing, operating, repairing, or maintaining the project. No completion, operation, repair, or maintenance by the Government shall operate to relieve the city of responsibility to meet its obligations as set forth in the Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to the Agreement.

A draft of this agreement is included on page D-24, in Appendix D - Pertinent Correspondence.

SECTION 5 - SUMMARY OF COORDINATION, PUBLIC VIEWS, AND COMMENTS

VIEWS OF FEDERAL AGENCIES

This Detailed Project Report and Environmental Assessment are being furnished to pertinent Federal agencies for their review. Letters previously received from Federal agencies expressing views and recommendations are included in Appendix D - Pertinent Correspondence.

As recommended by the Soil Conservation Service in their Flood Study Report, dated March 1982, landowners upstream of East Line Road are encouraged to practice land conservation techniques, such as installing tile outlet terraces. Measures such as these may not only slow the loss of topsoil but may reduce the frequency of flooding along Dry Run Creek.

VIEWS OF NON-FEDERAL AGENCIES

The alternative plans of improvement were coordinated with officials of the city of Oelwein and with interested local and State agencies. A public meeting was held to obtain views and comments from local interests. Preliminary support of the Channel Modification plan was expressed by city officials. Letters and comments received are contained in appendix D.

PUBLIC VIEWS

Public involvement seeks to create awareness and stimulate interest in a Corps of Engineers study. It is designed to encourage two-way communication and public participation in the planning and decisionmaking process of the study. The major objectives of the Public Involvement Program for the Detailed Project Study are to:

- a. Continually identify affected and interested individuals and groups within the study area.
- b. Be responsive to the level of interest and concern expressed by the public.
- c. Keep the Public Involvement Program visible and understood by the participating publics.

A public workshop was held in February 1986 to present an overview of the Detailed Project Study and to obtain public views on the alternative flood damage reduction measures to be studied. The meeting was attended by 17 individuals, including city council members, agency representatives, and city residents.

Comments from the public were solicited on the Draft DPR and Environmental Assessment by providing agency representatives, city officials, and concerned citizens copies of the report. In February 1987, the Rock Island District met with agency representatives, city officials, and the public to discuss comments and project features in detail. The city was in favor of the Channel Modification project, as evidenced by its Letter of Intent dated April 1, 1987 (see appendix D).

PUBLIC ACCEPTANCE

Project success is sensitive to public acceptance. For the selected plan, Channel Modification, the proposed channel is too small in cross section to have well-defined levels of flood protection or levels where all waters of a certain level of flooding are contained within the banks of the channel.

Although it is possible that the project would be acceptable in the short term, the perceptions of the damage reduction in the long term may result in negative attitudes. Table B-16 (page B-23 of the economic appendix) shows the damage and water surface reductions expected from the project. Although there are significant economic benefits, the residual damage is very high (54%) and the water surface is reduced generally less than 1 foot (as shown on plates 7, 8, and 9). Hence, the reduction in damage attributable to the Channel Modification project will probably not be perceived by the majority of property owners as being significant.

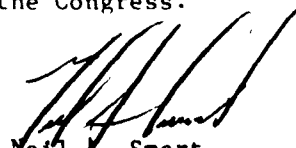
SECTION 6 - RECOMMENDATION

I recommend that the NED plan, which would reduce damages from flooding on Dry Run Creek in Oelwein, Iowa, be approved for construction with such modification as, in the discretion of the Chief of Engineers, may be advisable.

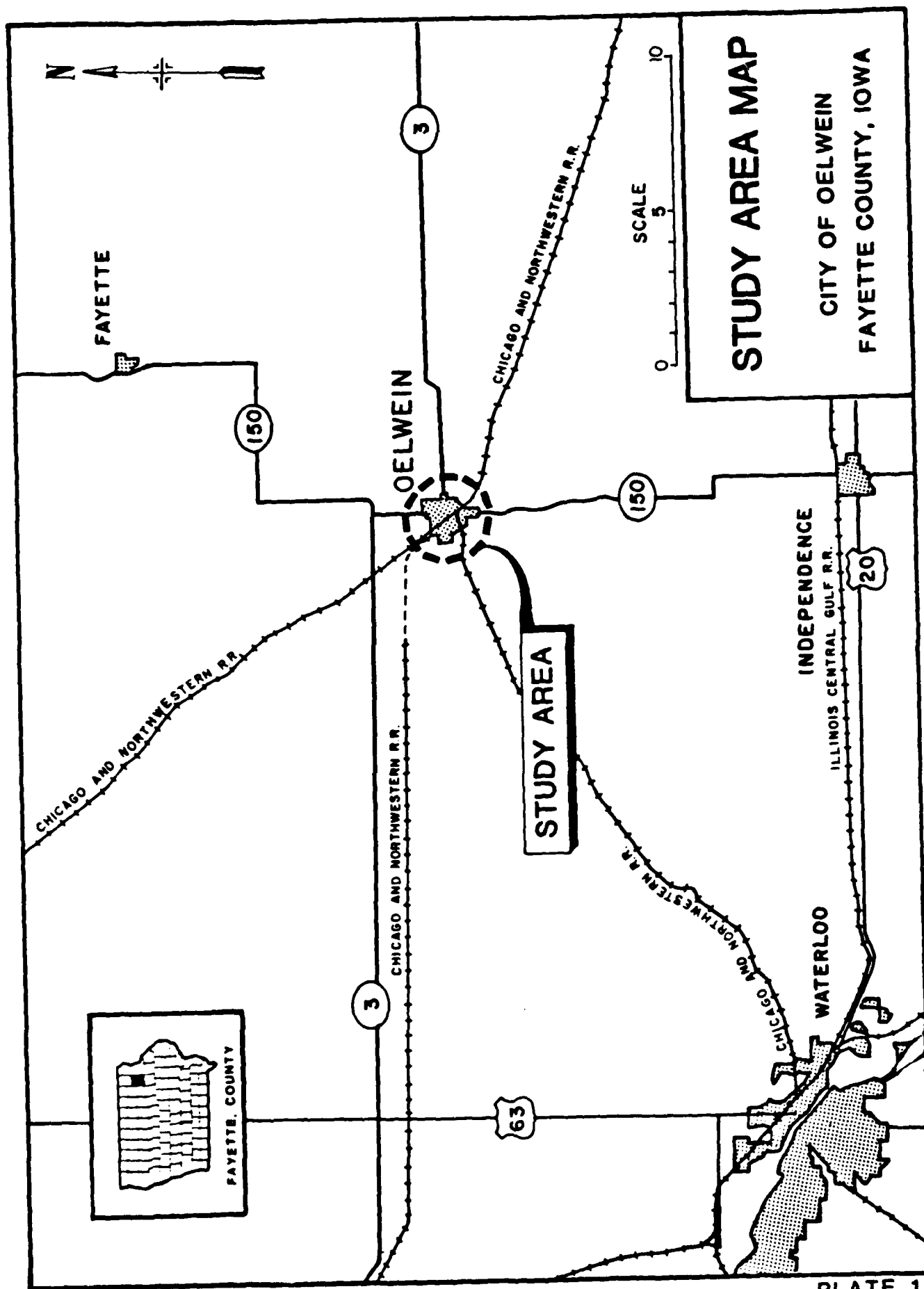
The Channel Modification plan includes 3,500 lineal feet of improved channel, of which 2,850 lineal feet is grass-lined and 650 lineal feet is riprap-lined. The project would produce net annual benefits of \$13,800 and has a benefit-to-cost ratio of 1.6, based on a 50-year economic life and a discount rate of 8-5/8 percent. The estimated total cost of the project is \$250,300.

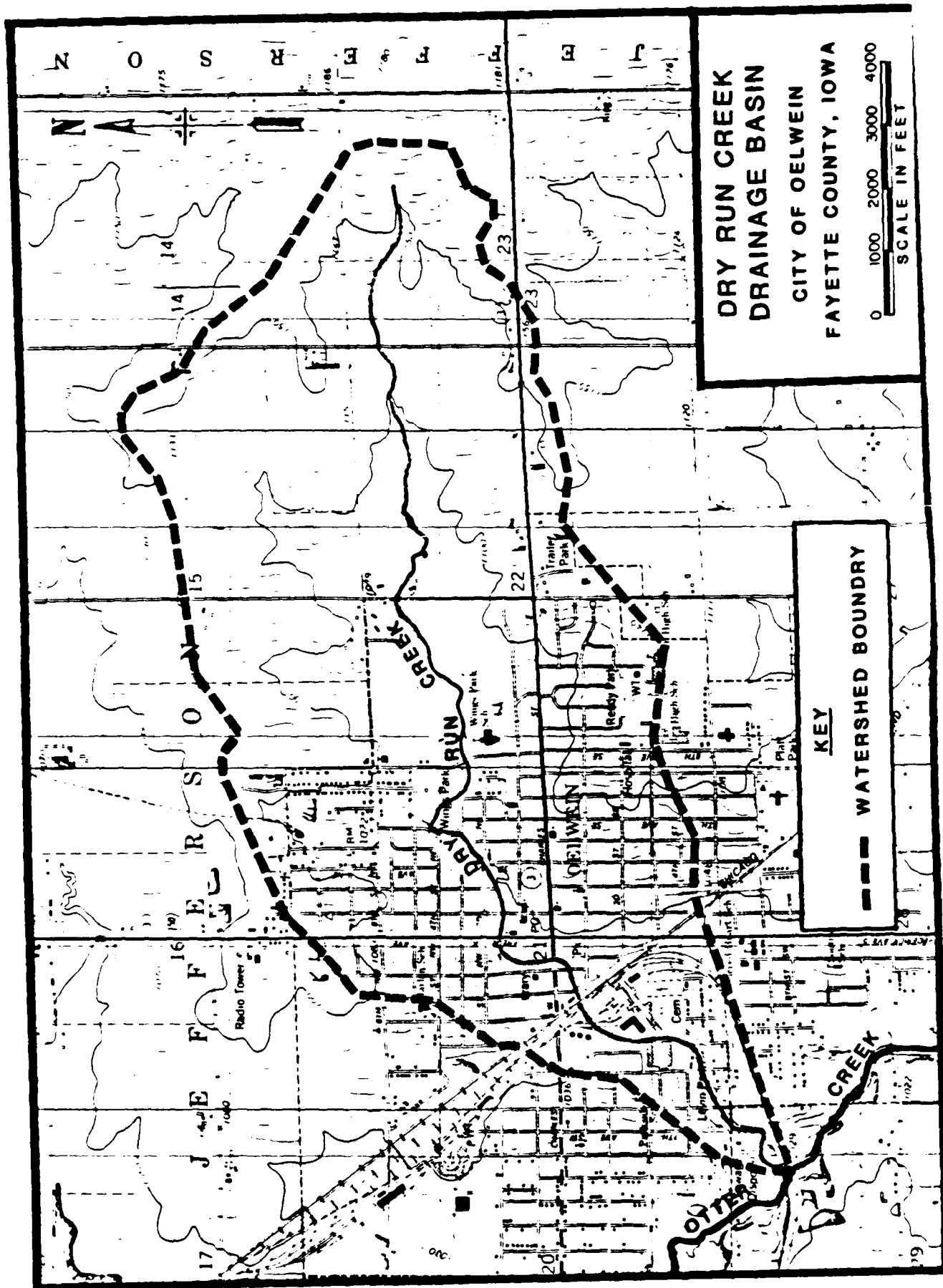
The Water Resources Development Act of 1986 (PL 99-662) requires that flood control projects be subject to cost-sharing. Based on these requirements, the non-Federal cost of the Oelwein project is \$125,150 (\$130,515 first cost less \$5,365 refund after final audit). In the event that cost-sharing requirements are changed or modified, the specific cost-sharing of the project shall be acceptable to the President and the Congress.

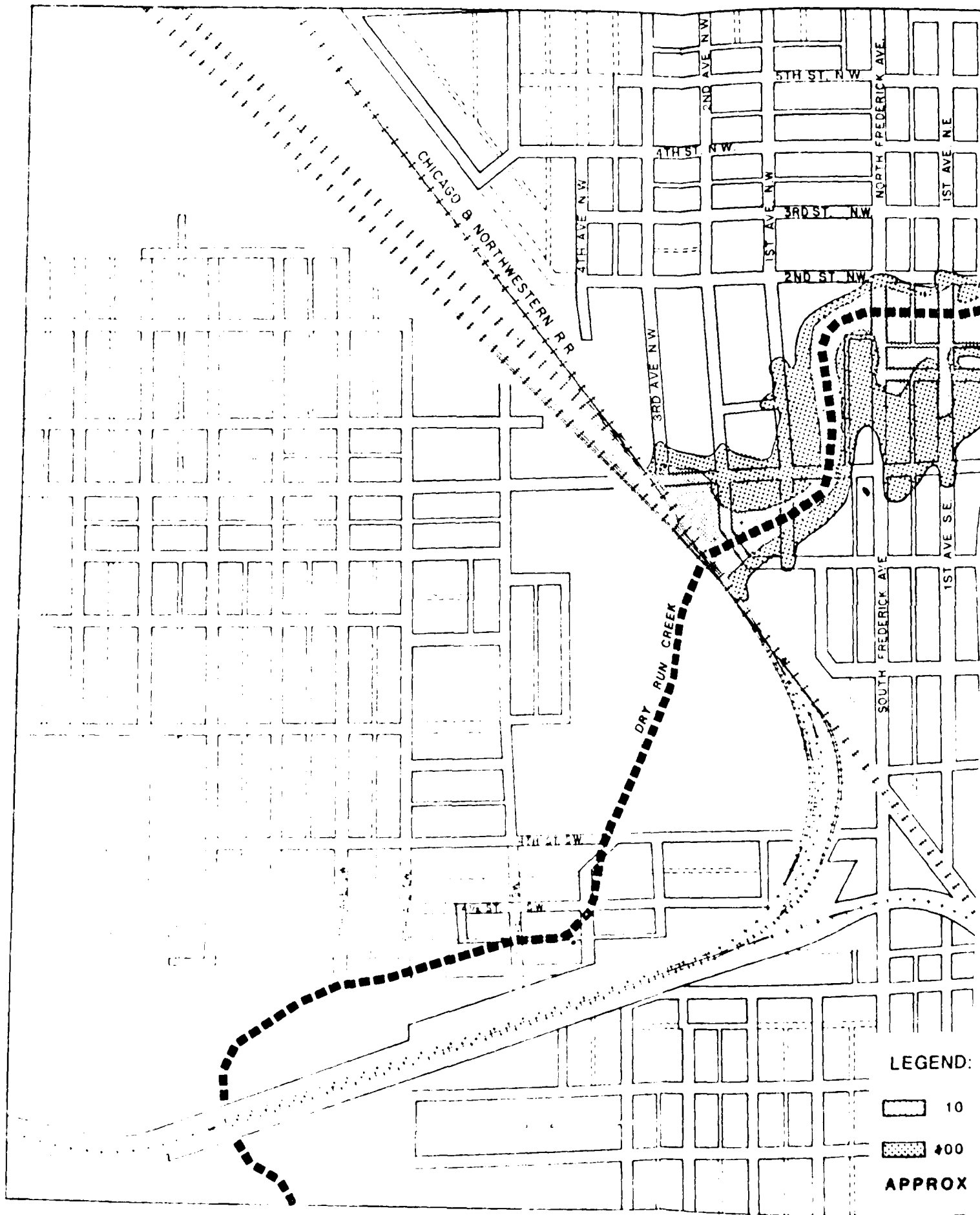
Accordingly, I recommend authorization to construct and otherwise implement the project subject to cost-sharing and financing arrangements which are satisfactory to the President and the Congress.

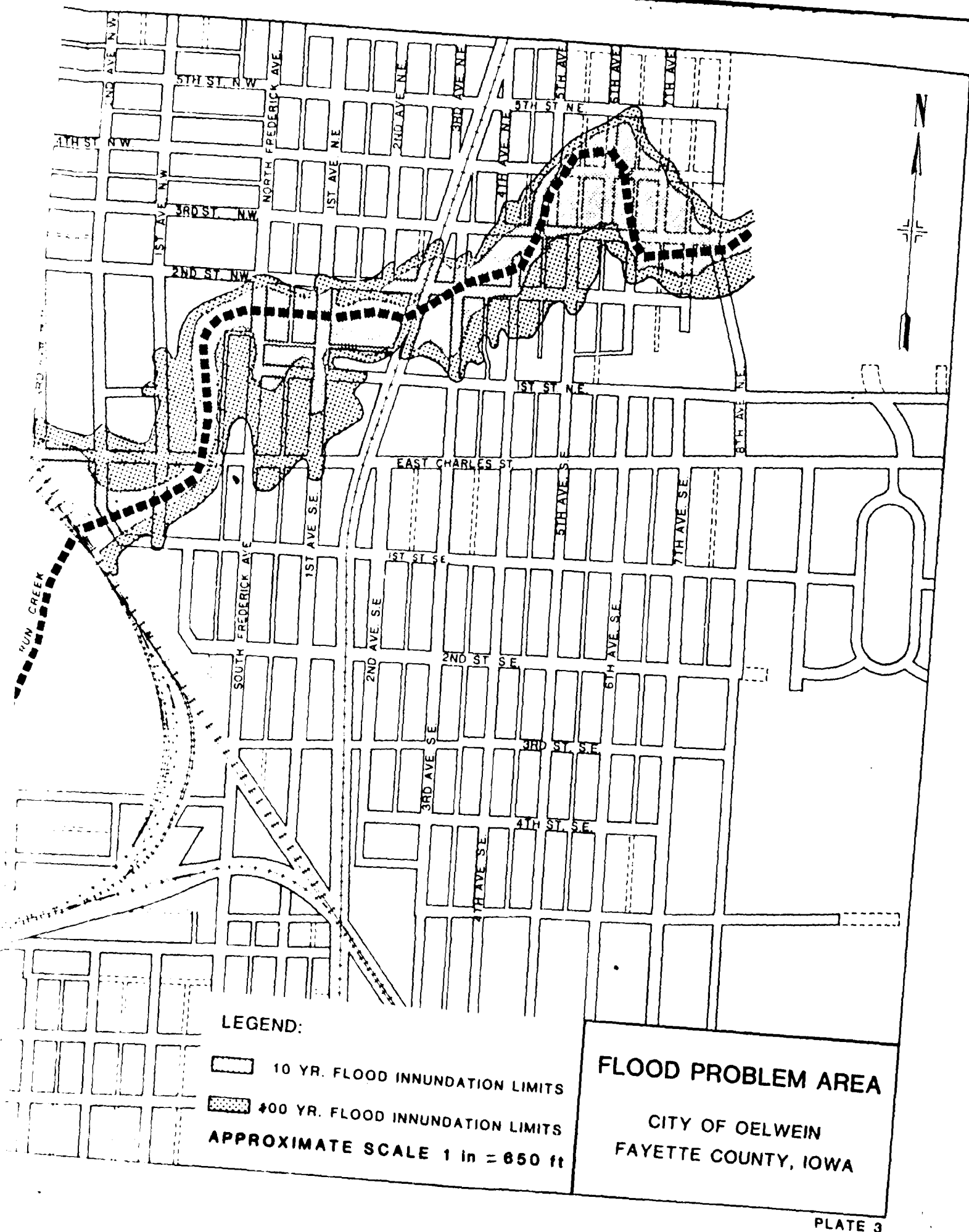


Neil A. Smart
Colonel, U.S. Army
District Engineer









LEGEND:

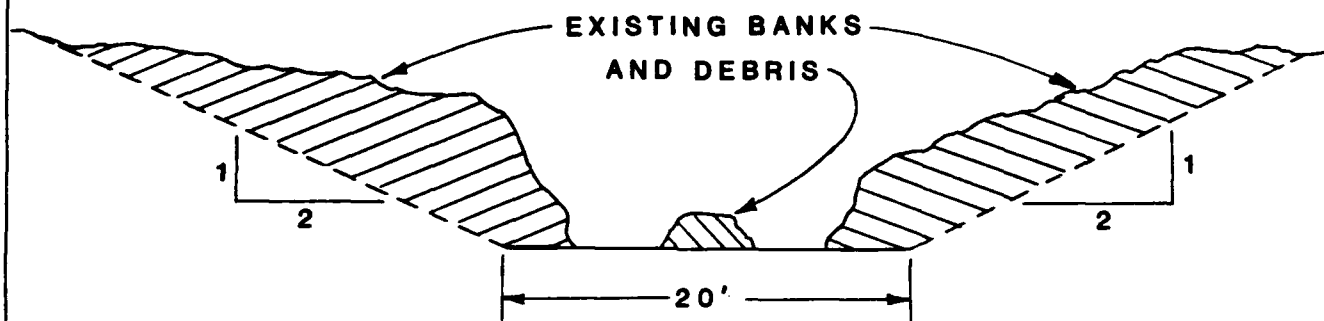
- 10 YR. FLOOD INUNDATION LIMITS
- 400 YR. FLOOD INUNDATION LIMITS

APPROXIMATE SCALE 1 in = 650 ft

FLOOD PROBLEM AREA

CITY OF OELWEIN
FAYETTE COUNTY, IOWA

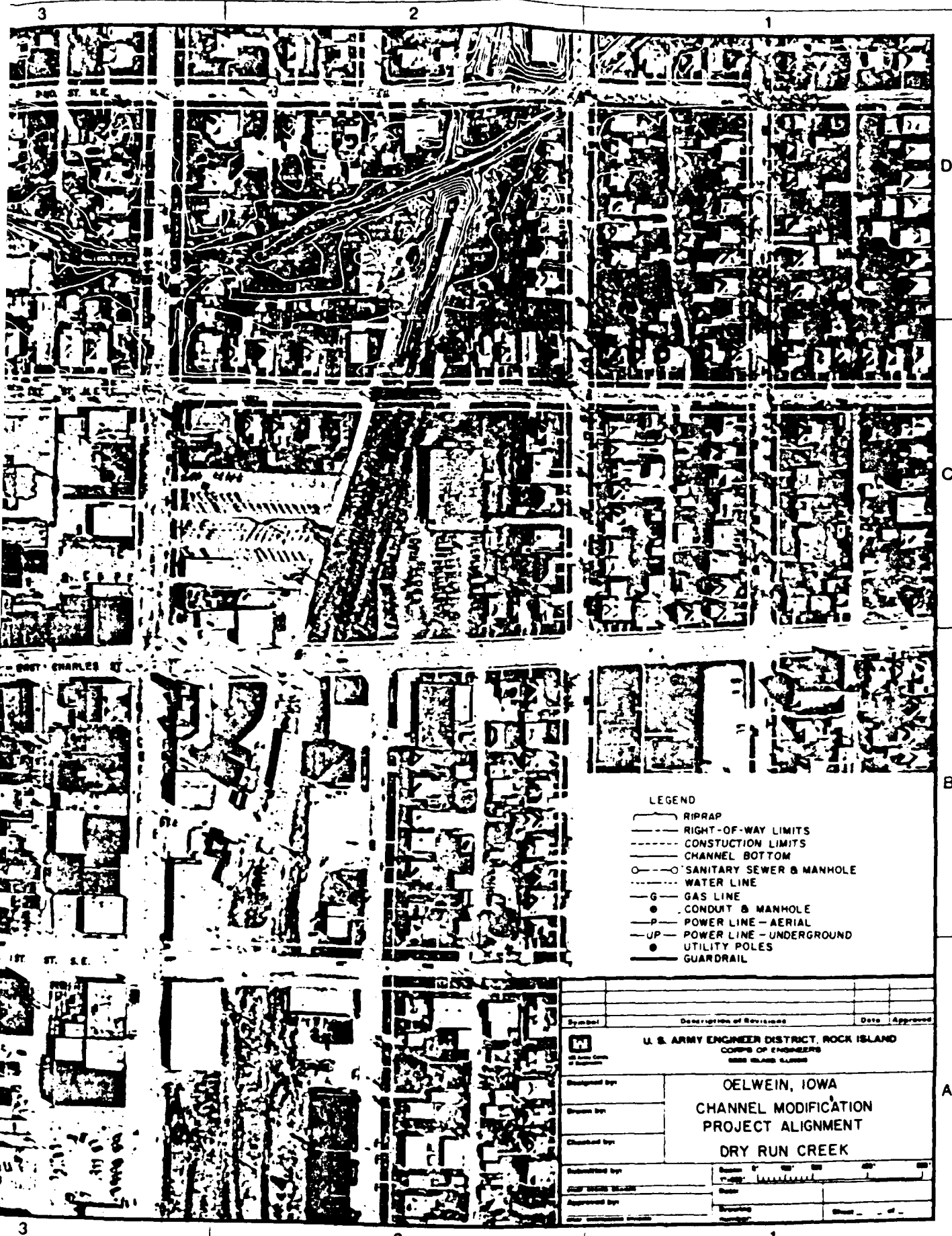
CHANNEL MODIFICATION



PROPOSED CHANNEL MODIFICATION PROJECT

CITY OF OELWEIN
FAYETTE COUNTY, IOWA





LEGEND

- RIPRAP
- RIGHT-OF-WAY LIMITS
- CONSTRUCTION LIMITS
- CHANNEL BOTTOM
- SANITARY SEWER & MANHOLE
- WATER LINE
- G— GAS LINE
- CONDUIT & MANHOLE
- P— POWER LINE—AERIAL
- UP— POWER LINE—UNDERGROUND
- UTILITY POLES
- GUARDRAIL

Symbol	Description of Revision	Date	Approved
U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS			
Designed by	OELWEIN, IOWA		
Drawn by	CHANNEL MODIFICATION		
Checked by	PROJECT ALIGNMENT		
Submitted by	DRY RUN CREEK		
Approved by	Scale: 1" = 100' Sheet: 1 of 1		





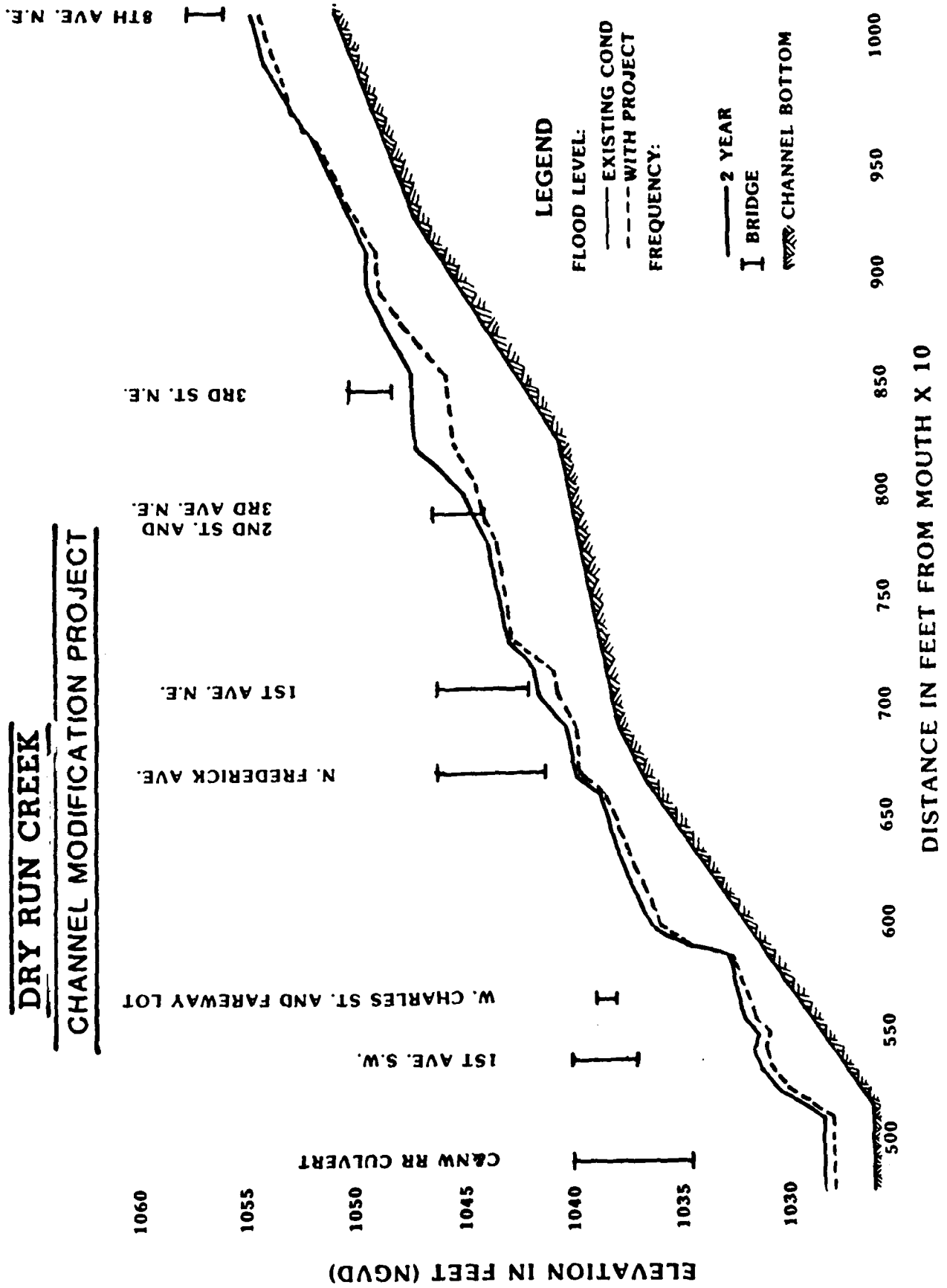
LEGEND

- RIPRAP
- RIGHT-OF-WAY LIMITS
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- CHANNEL BOTTOM
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- GUARDRAIL

Symbol	Description of Revisions	Date	Approved
U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS			
Designed by:	OELWEIN, IOWA		
Drawn by:	CHANNEL MODIFICATION		
Checked by:	PROJECT ALIGNMENT		
Submitted by:	DRY RUN CREEK		
Approved by:	Scale: 1" = 100' North Arrow		

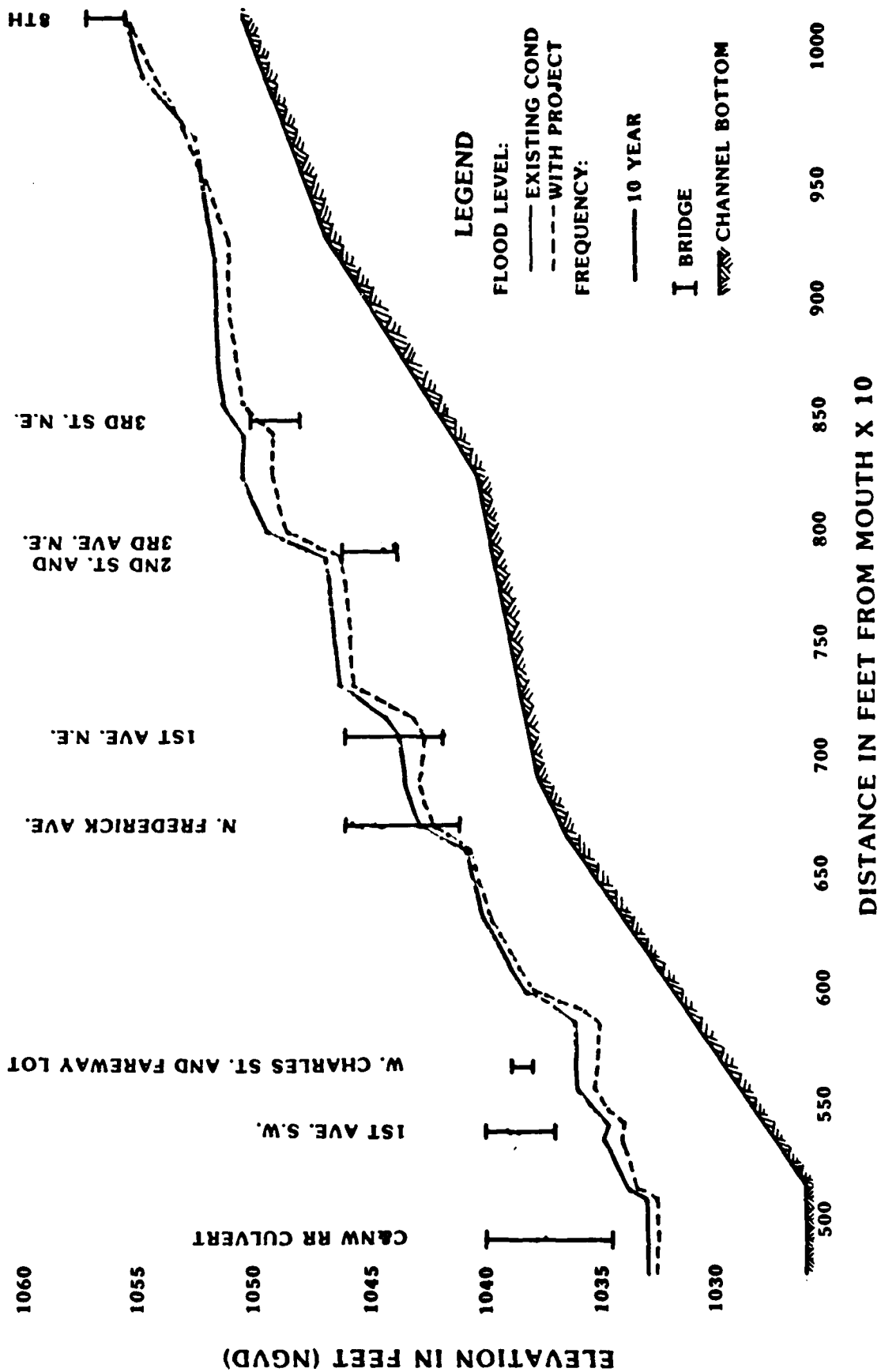
DRY RUN CREEK

CHANNEL MODIFICATION PROJECT



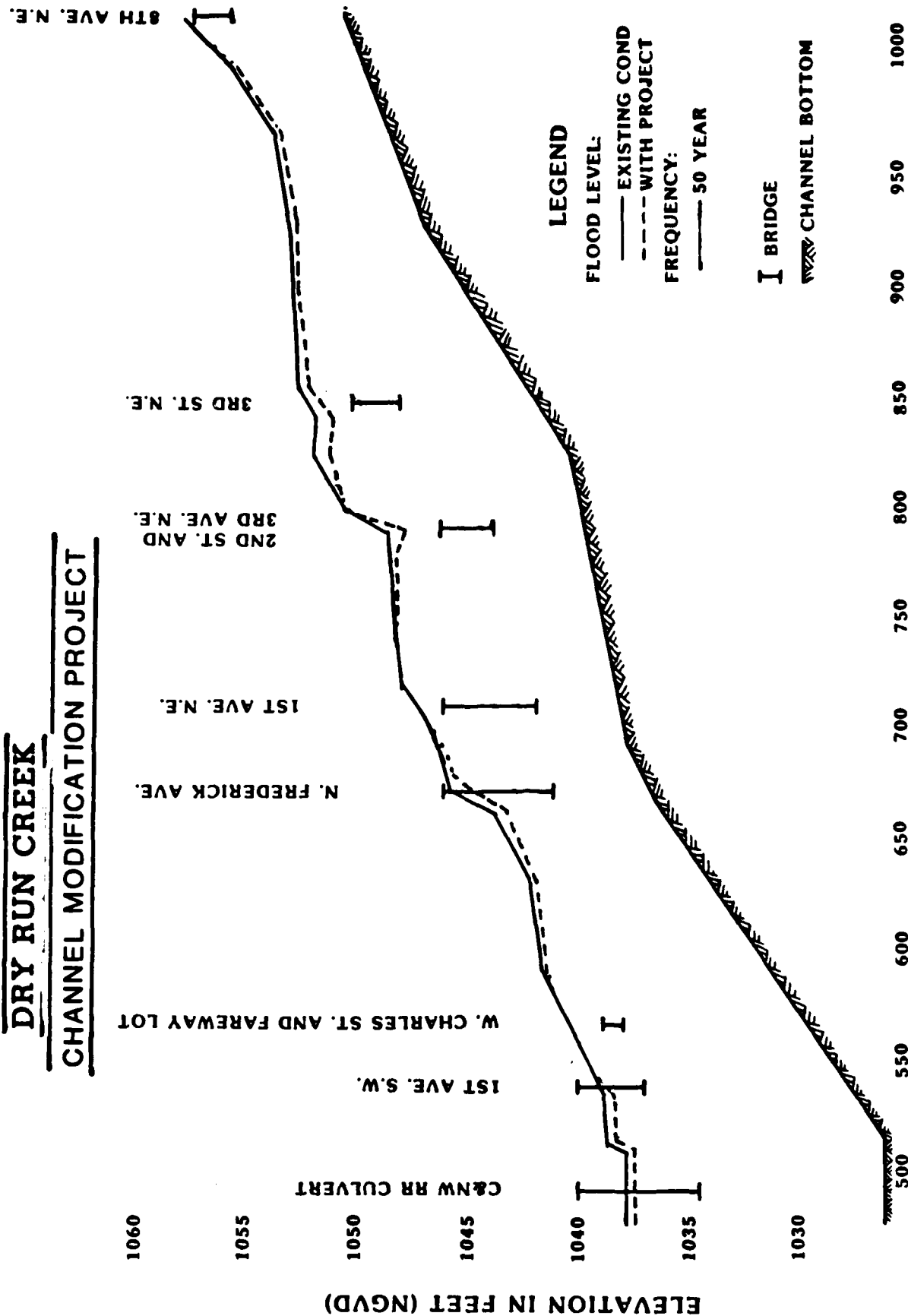
DRY RUN CREEK

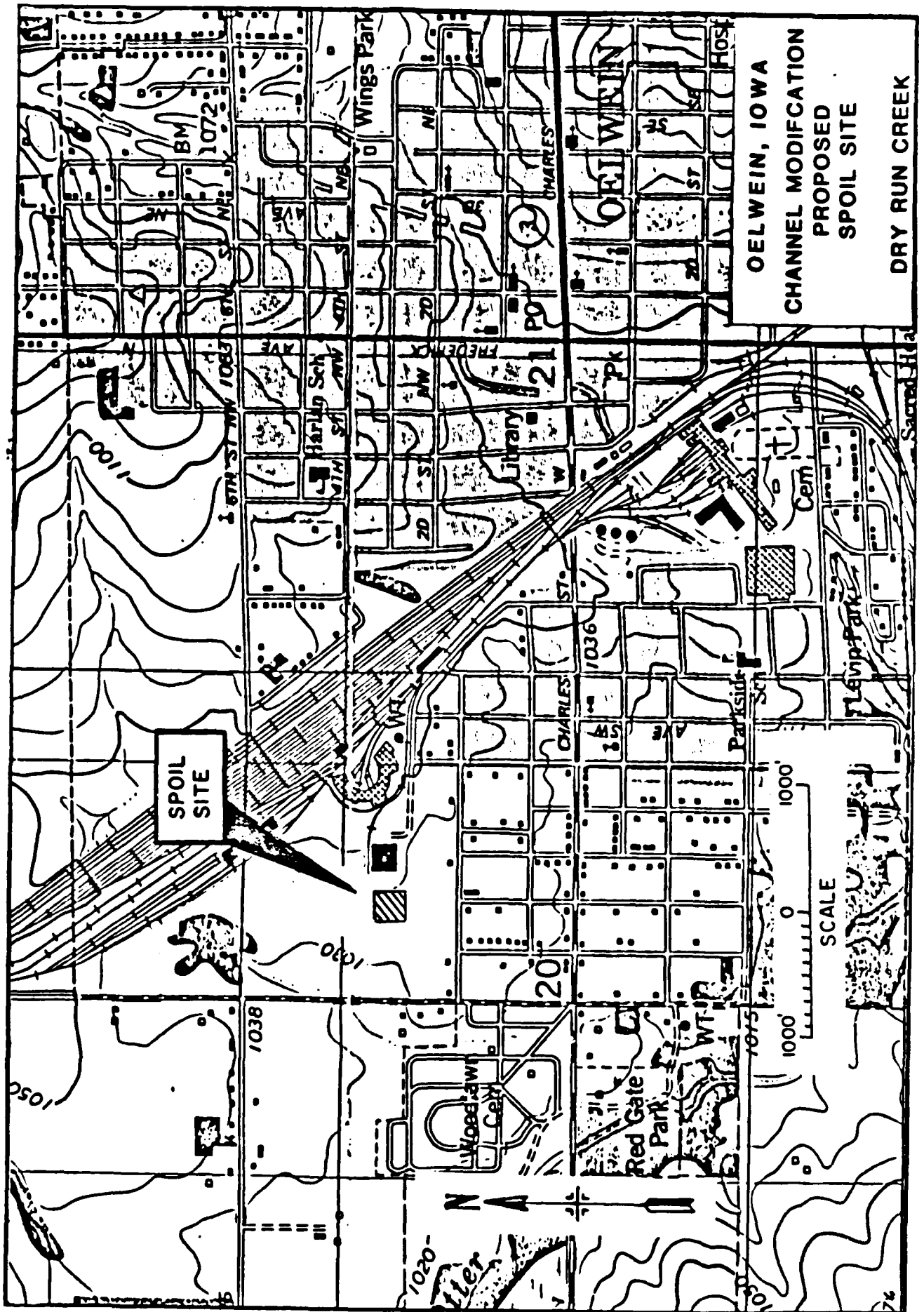
CHANNEL MODIFICATION PROJECT



DRY RUN CREEK

CHANNEL MODIFICATION PROJECT





ENVIRONMENTAL ASSESSMENT



REPLY TO
ATTENTION OF
CENCR-PD-E

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

ENVIRONMENTAL ASSESSMENT
FOR
DETAILED PROJECT REPORT
SECTION 205 FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

JUNE 1987

ENVIRONMENTAL ASSESSMENT
FOR
DETAILED PROJECT REPORT
SECTION 205 FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

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Finding of No Significant Impact (FONSI)

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ENVIRONMENTAL ASSESSMENT
FOR
DETAILED PROJECT REPORT
SECTION 205 FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

I. PURPOSE AND NEED FOR ACTION.

The purpose of the proposed project is to alleviate flooding problems along Dry Run Creek in Oelwein, Iowa. Excessive runoff causes overbank flooding during periods of intense rainfall and snowmelt. The Dry Run Creek watershed at Oelwein is about 3.0 square miles.

II. PROJECT DESCRIPTION.

The preferred alternative will involve channel modification along a 3,500-foot reach of Dry Run Creek from the Chicago and Northwestern (C&NW) Railroad culvert upstream to the bridge at Third Street NE. Modification will include channel cleaning, widening, and slight realignment of the channel where necessary (no existing structures will be removed or demolished). The improved channel will have a 20-foot minimum bottom width with 2:1 minimum side slopes.

Riprap will be placed downstream of two bridges where channel modification will cause some increase in velocity. About 110 cubic yards of riprap will be placed downstream of the bridge at Third Street NE. for approximately 50 feet on both sides of the stream. Riprap also will be placed downstream of the Frederick Avenue Bridge for approximately 550 feet on the right bank (looking downstream) and 250 feet on the left bank. This placement will require 450 cubic yards of material.

The proposed disposal site is located on a portion of land on the western side of Oelwein. About 4,800 cubic yards of material will be removed from the channel, and the spoil will be deposited on a tract of land west of the C&NW Railroad tracks.

III. ALTERNATIVES.

A. No Federal Action. No structural or nonstructural measures would be constructed or adopted. The city of Oelwein would continue to suffer damages from periodic flooding along Dry Run Creek.

B. Channel Modification. This plan involves clearing the channel of debris, widening the channel bottom, and reshaping the channel side slopes. The channel bottom would be widened to a 20-foot width and the side slopes would be reshaped to a 1V on 2H slope where right-of-way permits (no existing structures would be removed or demolished). Channel modification would begin just downstream of Third Street NE. and end at the upstream side of the C&NW Railroad culvert. This is the preferred alternative.

C. Floodproofing. This alternative involves raising existing or future structures above flood heights or providing panels that can be placed over building doors and windows. Although it is more simply and economically applied to new construction, floodproofing is also applicable to existing structures.

D. Flood Forecasting and Flood-Warning Systems. This plan involves the transmission of flood warnings and statements on flood conditions, issued by the National Oceanic and Atmospheric Administration (NOAA), to city officials as well as to local newspapers, radio, and television stations. The plan also would involve placement of a water level sensing device or devices connected to an alarm. As water levels rise and reach a potentially threatening level, the alarm would be activated, providing increased safety to area residents by furnishing evacuation time.

E. Evacuation and Relocation. This alternative would involve the evacuation and relocation of all residents and the removal and relocation of all structures currently within the areas which are susceptible to flooding. About 60 homes and 30 businesses are located in the 100-year floodplain. Of these, approximately 25 businesses and 13 homes would be damaged by a flood of similar magnitude to the 1984 flood.

F. Upstream Floodwater Storage Basin. This plan would involve the construction of an earthen embankment to detain flood flows, with an outlet structure to allow passage of flows up to the capacity of the downstream channel. The storage basin would be dry until flow exceeded the capacity of the outlet structure. Three sites were selected for analysis as having the most natural storage potential. These sites, each located upstream of East Line Road, would have the potential to store floodwaters up to a 10-year occurrence (10-year flood).

G. Concrete Floodwall. This plan consists of a concrete floodwall on both sides of Dry Run Creek within the flood problem area and appropriate closure structures for each opening in the walls. Property adjacent to the stream would need to be acquired to construct this alternative.

H. Levees and Floodwalls. This alternative would consist of an integrated system of levees and floodwalls along both sides of Dry Run Creek through the flood problem area. Levees would be constructed of an earthen embankment with an 8-foot top width and 1 on 3 side slopes. Concrete floodwalls would be constructed where structures limit right-of-way necessary for levee construction. Adjacent property would be acquired and appropriate closure structures would be constructed where major thoroughfares intersect the levee or floodwall alignment.

I. Earthen Levee. This plan consists of levees, as described in the previous alternative, aligned on both sides of the channel through the flood problem area. However, contrary to the previous alternative where structures encroach on right-of-way necessary for construction, the structures would be acquired and removed from the project alignment.

J. Excavated Pit Storage Basin. This alternative involves construction of a pit storage basin for holding floodwaters. Flows greater than a 2-year flood (assumed existing channel capacity) up to the design capacity would be diverted to and stored in the pit. The floodwater would be stored until the flood recedes, and then would be pumped out of the pit and back into the channel at a rate which the channel could safely convey.

K. Concrete-Lined Widened Rectangular Channel. This plan consists of a channel widened to a 40-foot bottom width, with vertical concrete retaining walls. This size channel would be capable of passing a 100-year flood with 1 foot of freeboard.

L. Railroad Culvert Modification. This alternative would involve modification of the restriction caused by the twin box culvert under the C&NW Railroad tracks near Second Avenue SW. Construction of a third culvert similar in size to the two already in place would delay creation of a backwater effect until flows reach the level of approximately the 100-year flood. This alternative would reduce flood damages in the area between the C&NW Railroad culvert and a commercial business parking lot located between First Avenue NW. and North Frederick Avenue.

IV. AFFECTED ENVIRONMENT.

The city of Oelwein is located approximately 40 miles northeast of Waterloo in Fayette County, Iowa, and has a population of 7,402 (1985 census). Oelwein is the largest city between Waterloo and Dubuque. Local agriculture-related industries and the C&NW Railroad are major sources of employment.

A. Dry Run Creek. Dry Run Creek drains into Otter Creek, a tributary of the Wapsipinicon River. The creek is approximately 4.5 miles in length, with a drainage area of 3.0 square miles. Average watershed slopes are between 2 and 3 percent. Dry Run Creek is the principal drainage outlet for the city of Oelwein and flows in a southwesterly direction through the city. The flood problem area is a portion of the channel extending from the inlet of the C&NW Railroad culvert upstream to the bridge at Eighth Avenue NE.

Land use along this section of the creek is primarily urban, with the downstream portion of the study area being mainly commercial and high density single-family residential and the upstream portion consisting of scattered single-family residential and recreational (Wings Park).

The banks are generally well vegetated throughout the study area. The substrate is composed of unconsolidated material consisting of sand, silt, gravel, and some rock and rubble.

B. Fish and Wildlife. Dry Run Creek is an intermittent stream with a sandy bottom and some development of a pool and riffle sequence. No data on fish species in the creek are available. During the site visit on 28 May 1986, a small school of minnows was observed at the inlet to the C&NW Railroad culvert. Because of the intermittent nature of the stream, it probably does not support a permanent fishery.

Wildlife habitat within the study area is minimal due to the urbanized nature of the area. Habitat is limited to mixing grasses and forbs along the creek bank, scattered trees, and adjacent manicured residential and recreational areas. Wildlife species likely to be present in the study area include raccoons, rabbits, squirrels, shrews, mice, woodpeckers, songbirds, and some amphibians and reptiles. No unusual or critical terrestrial habitats are known to exist within the study area.

C. Water Quality. Dry Run Creek is a small, ungaged stream, and no water quality data are currently available for the study area. During the site visit of 28 and 29 May 1986, water flowing through the project area was observed to be clear with little evidence of turbidity, despite recent rains. Conversations with Mr. Ralph Turkle of the Iowa Department of Water, Air, and Waste Management indicated that Dry Run Creek is typical of other small drainages in the state. Under low or normal flow conditions, non-point source pollution from agricultural and urban runoff could result in increased turbidity and levels of dissolved solids. This type of non-point runoff is presently uncontrollable.

D. Vegetation. The creek within the city of Oelwein is bordered by residential and commercial areas and by a city park. Vegetation in the overbank areas consists mostly of mowed grass, trees and shrubs, typical of urban landscaping. Vegetation on the side slopes of the channel consists mainly of grasses and forbs with some shrubs and trees. Tree species noted include silver maple (Acer saccharinum), cottonwood (Populus deltoides), willow (Salix sp.), box elder (Acer negundo), and hackberry (Celtis occidentalis). Herbaceous plant species observed included grasses such as orchard grass (Dactylis glomerata), reed canary grass (Phalaris arundinacea), switch grass (Panicum virgatum), brome grass (Bromus tectorum), crabgrass (Digitaria sanguinalis), foxtail (Setaria sp.), and various forbs such as stinging nettle (Urtica dioica), ragweed (Ambrosia sp.), common and swamp milkweed (Asclepias syriaca and Asclepias incarnata), and goldenrod (Solidago sp.).

E. Climate. Fayette County's climate is subhumid midcontinental. Mean annual temperature is 46 degrees Fahrenheit. The annual temperature range is large, with January temperatures averaging 17 degrees Fahrenheit (-8.4°C) and July temperatures averaging 72 degrees Fahrenheit (22.4°C). The average annual precipitation is approximately 34 inches (86.4 cm).

F. Geology and Soils. Oelwein and its surrounding area is underlain with limestone rock. Topography of the Oelwein area ranges from nearly flat to gently sloping. Soils in the area originated primarily from glacial drift, loess, alluvium and eolian or wind-deposited sand. Soil types within the study area include Saude loam and Coland clay loam. Soils are generally moderate to high in organic matter and have moderate water infiltration and transmission capabilities.

G. Disposal Site. The proposed disposal site is located on a tract of land west and north of the Iowa Ham Building at Third Street and Ninth Avenue NW. The area appears to be a previously cultivated agricultural field, left fallow for at least 15 years. Vegetation consists primarily of adventitious forbs, woody shrubs, and scattered trees characteristic of old field secondary successional growth.

Goldenrod (Solidago sp.) was the dominant forb species observed in the area. Tree species observed included silver maple (Acer saccharinum), box elder (Acer negundo), American elm (Ulmus americana), cottonwood (Populus sp.), and black cherry (Prunus serotina). This area would provide some food and cover for songbirds and small mammals.

V. ENVIRONMENTAL CONSEQUENCES OF PREFERRED ACTION.

A summary of project impacts can be found in Table EA-1, Effects of the Recommended Plan on Natural and Cultural Resources.

A. Social Impacts.

1. Noise. Construction of the proposed project would result in elevated noise levels from construction equipment. Estimated noise levels during construction are expected to range intermittently between 72 and 92 dbA at 50 feet. The Wings Park School, located approximately 1,400 feet from the upstream end of the study reach, should not be adversely affected by construction of the project. The Oelwein Public Library is located approximately 200 feet from the channel near the Fareway culvert. Noise from construction equipment could have some effect on this facility and on businesses and residences adjacent to the channel throughout the project reach; however, these impacts will be of short duration.

2. Displacement of People. No residences or businesses will be removed or relocated and no persons will be displaced by the proposed project.

3. Aesthetic Values. Disturbance by construction activity will cause temporary unsightliness. The removal of trees and herbaceous plants will have a negative impact on the aesthetic values of the study area. Streambanks will be seeded with a mixture of grasses to stabilize slopes and to provide food and cover for wildlife. This also will help to make the area more aesthetically pleasing.

TABLE EA-1

Effects of the Recommended
Plan on Natural and Cultural Resources

<u>Types of Resources</u>	<u>Authorities</u>	<u>Evaluation of Effects</u>
Air quality	Clean Air Act, as amended (42 U.S.C. 1657h-7 et seq.)	No effect
Areas of particular concern within the coastal zone	Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.)	Not present in planning area
Endangered and threatened species critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)	No known significant use
Fish and wildlife habitat	Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)	Temporary impacts during construction phase
Floodplains	Executive Order 11988, Flood Plain Management	No significant effect
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.)	No significant effect
Prime and unique farmland	CEQ Memorandum of August 1, 1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	Not present in planning area
Water quality	Clean Water Act of 1977 as amended (33 U.S.C. 1251 et seq.)	Temporary resuspension during construction phase
Wetlands	Executive Order 11990 Protection of Wetlands, Clean Water Act of 1977, as amended (42 U.S.C. 1857h-7 et seq.)	No effect
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271 et seq.)	Not present in planning area

4. Community Cohesion. The proposed project involves cleaning and widening the existing channel, thereby minimizing the disturbance to existing neighborhoods. Since no relocations will result from construction, the project should not affect community cohesion.

5. Desirable Community Growth. Because of the small scale of the project, few employees would be required. The surrounding area would not be affected since the local population provides a labor pool of sufficient size to absorb project needs.

B. Economic Impacts.

1. Property Values. The proposed project will reduce the incidence of flooding in the city of Oelwein. The project would therefore result in slightly improved services to and from the affected areas. A minimal increase in property values would be expected due to the reduction of flood damages in these areas.

2. Tax Revenues. A slight increase in tax revenues would be expected as a result of the anticipated rise in property values. This increase might offset some of the tax losses due to removing approximately 5.5 acres of project alignment real estate from the tax rolls.

3. Public Facilities/Services. Some temporary disruption of normal traffic (blocked streets) could occur during construction of the project. Some improvement in services to and from the affected areas would be expected due to the reduced incidence of flooding. Benefits resulting from the project are difficult to quantify, but would be present in a small degree. For example, during times of flooding, ambulances must drive at reduced speeds when using flooded roads or use roads which skirt flooded areas, thereby slowing response time. Some of this effect would be reduced. The project would slightly decrease erosion damages to seven bridges, and would decrease interrupted access to four churches and two public parks.

4. Desirable Regional Growth. No direct impact on regional growth would be expected due to the project's limited area of influence.

5. Employment/Labor Force. The proposed project would not affect the permanent employment or labor force of the area. However, the project would temporarily increase area employment during the construction phase.

6. Business and Industrial Activity. Changes in business and industrial activity as a result of the proposed project would be minimal. The increase in business activity occurring from the temporary infusion of construction workers would be absorbed into the area without long-term effect. The influence of floodwaters acting as a barrier separating residential areas from the central business district would be slightly reduced. This reduction in flooding would decrease interrupted interaction between these businesses and their customers. No business relocations would be required for the project.

7. Farm Displacement. No farms or farmland would be affected by the project.

C. Environmental Impacts.

1. Manmade Resources. No homes, buildings, or other structures would be relocated or demolished as a result of the project.

2. Natural Resources. Impacts to natural resources would be minimal due to the urbanized nature of the project area. Areas impacted by the proposed channel modification would mostly consist of residential properties (lawns, gardens, ornamental trees, and plants). Clearing of vegetation along approximately 3,000 feet of streambank would be required. The loss of trees and other vegetation would have a minor impact on urban wildlife such as songbirds and small mammals. Following project construction, the banks would be revegetated to provide soil stabilization as well as wildlife and aesthetic values. The project would not significantly affect aquatic resources of Dry Run Creek.

Loss of vegetation on the proposed disposal site would have a minimal impact on small mammals and birds which may use the area for cover and feeding. Vegetation would be reestablished within a relatively short time.

3. Air Quality. Exhaust emissions and fugitive dust particles from construction vehicles and equipment would contribute to air pollution; however, this impact will be moderate and short-term. No violations to air quality standards are anticipated.

4. Water Quality. It is anticipated that minor, temporary increases in suspended particles and turbidity would result from construction activities. The completed project would have no impact on water quality.

5. Water Conservation. The completed project would not increase or decrease water use or losses.

6. Threatened and Endangered Species. The northern wild monkshood (Aconitum noveboracense) is the only federally listed species for Fayette County and has a "threatened" status. The monkshood grows on shaded, talus slopes, exposed to the north and east. In Iowa, this species grows in a thin soil layer deposited over cobblestone-size limestone. These habitat conditions are not found in the study area and, consequently, impacts to this plant are not anticipated.

Several State-listed endangered or threatened species were identified as having the potential for occurring in Fayette County. Plant species include putty root (Aplectrum hymemale), field sedge (Carex conoidea), fringed gentian (Gentiana crinita), golden-seal (Hydrastis canadensis), and summer grape (Vitis aestivalis). Fish species include American brook lamprey (Lampetra lamottei), gravel chub (Hybopsis x-punctata) and Topeka shiner (Notropis topeka). Because of the urbanized nature of the project area, no habitat that could be considered critical to the survival of any of the State threatened or endangered species has been identified within the project area and, consequently, no impacts to State-listed species are anticipated.

7. Archaeological/Historical. No buildings or other structures would be removed or demolished as a result of the project, and no historical or archeological sites are known to be present in the vicinity of the proposed project. A site visit to the area was made on 28-29 May 1986. During this visit, a surface survey and archives search was conducted for the project area and the proposed spoil site. No historic structures or other historic sites were identified as a result of the archives search.

With respect to subsurface cultural deposits, the proposed project is located in an urban residential area which has been severely disturbed by house and road construction. The potential for encountering intact archeological deposits in this area is estimated to be negligible. Based on the results of these investigations, it is our determination that the proposed channel modification project will have No Effect on significant cultural resources within the city of Oelwein. The Iowa State Historic Preservation Officer has concurred with this determination in a letter dated 30 September 1986 (appendix D of the main report).

VI. ENVIRONMENTAL IMPACTS OF ALTERNATIVES.

Alternatives to the proposed plan were identified and evaluated in the reconnaissance report. With the exception of the No Action alternative, these plans were eliminated from further analysis due to economic, social, or environmental factors. Predicted environmental impacts of these alternatives are summarized as follows:

A. No Federal Action. This alternative would have an adverse impact on man-made resources through continuation of periodic flooding, causing damage to structures and property and moderate disruption to community services. The alternative would not affect natural resources.

B. Channel Modification. Environmental impacts of this plan are discussed in Section V - Environmental Consequences of the Preferred Action.

C. Floodproofing. This alternative would have little or no impact on natural resources. Minimal to moderate impacts to man-made resources could result from alteration of existing structures. Problems of access to raised structures could be created. Placement of panels over doors and windows would have minimal impacts to structures.

D. Flood Forecasting and Flood-Warning System. This alternative would have no adverse impact on natural resources. Establishment of a flood forecasting and flood-warning system would have a minor effect on community services in the form of increased manhours required for municipal employees for emergency duty and for operation and maintenance of monitoring equipment.

E. Evacuation and Relocation. Removal and relocation of the residents and structures in the flood-prone areas would cause some disruption of the central downtown business district and its established infrastructure. Relocation also would have an adverse effect on community cohesion and could cause some individual hardship to those directly affected.

F. Upstream Floodwater Storage Basin. The construction of one or more detention basins upstream of East Line Road would have considerable effect on the portions of the stream where the impoundment would be located. The creek in this area is well vegetated and has been less influenced by urbanization than the downstream portions. While the natural resource value of the upstream area has not been fully assessed, it is anticipated that construction of a storage basin would cause substantial alteration of existing habitat through removal of vegetative cover and transformation of a free-flowing stream into a periodic reservoir. Inundation of adjacent farmland could result in crop damage and subsequent loss of income.

G. Concrete Floodwall. Construction of floodwalls in the flood problem area would require the acquisition of property adjacent to the creek, though few structures would be removed. This alternative would have some impact on aesthetic values through blocking the view of the creek.

H. Levees and Floodwalls. A combination of levees and floodwalls would have impacts similar to Alternatives G and H above, however, more land would be required for construction of levees.

I. Earthen Levee. This alternative would require the acquisition and removal of structures which encroach on the right-of-way of the levees. This would have moderate impacts on man-made resources through removal of some properties from the tax rolls.

J. Excavated Pit Storage Basin. Construction of a storage basin would have an effect on the immediate site by changing the present land use. The creation of a large pond of standing water in the project area could have some impacts to natural and man-made resources, the degree of impact depending on the length of time water would need to be stored in the basin.

K. Concrete-Lined Widened Rectangular Channel. This plan would result in the removal of aquatic and terrestrial habitat from the study area. Increased velocity of floodwaters in the concrete-lined channel also could present a safety hazard.

L. Railroad Culvert Modification. Construction of a third box culvert under the C&NW Railroad tracks would reduce flood levels in the area immediately upstream of the culvert, but could have an impact downstream of the culvert where increased flows could cause flood damages and stream-bank erosion.

VII. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED.

A. Natural Resources. Removal of vegetation and shaping of channel side slopes will have a negative impact on wildlife which utilize the banks for cover and as a food source. An increase in turbidity and suspended solids will have a negative impact on aquatic organisms in the project area. Both of these impacts will be minor and short-term. Revegetation of the area upon completion of construction will stabilize banks and provide food and cover for wildlife.

B. Social Impacts. The removal of approximately 4.1 acres of project alignment real estate from the tax rolls would be unavoidable if the preferred alternative is constructed, but would not create any significant social impacts.

VIII. RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY.

Completion of the proposed action would reduce the potential for flooding to a portion of the city of Oelwein and would reduce future disruption to the well-being and productivity of the area.

IX. ANY IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IF THE PROPOSED ACTION SHOULD BE IMPLEMENTED.

Fuel consumed and manpower expended during the implementation of the proposed action are considered irretrievable.

X. RELATIONSHIP OF THE PROPOSED PROJECT TO LAND-USE PLANS.

The proposed action does not conflict with existing land-use plans or local zoning ordinances for the area.

XI. COMPLIANCE WITH ENVIRONMENTAL QUALITY STATUTES.

A summary of compliance with environmental statutes can be found in Table EA-2 - Relationship of Proposed Plan to Environmental Protection Statutes.

A. Endangered Species. Consultation with the U.S. Fish and Wildlife Service (FWS) was initiated under Section 7 of the Endangered Species Act of 1973, as amended. The FWS and the U.S. Army Corps of Engineers determined that the project would have no adverse impacts on any endangered species. (See FWS letter, dated 21 July 1986, in Appendix D - Pertinent Correspondence of the main report.)

TABLE EA-2

Relationship of Proposed Plan to Environmental Protection Statutes

<u>Federal Policies</u>	<u>Compliance</u>
Archaeological and Historic Preservation Act, 16 U.S.C. 469, et seq.)	Full Compliance
Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Full Compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Full Compliance
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not Applicable
Endangered Species Act, 16 U.S.C. 1531, et seq.	Full Compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not Applicable
Federal Water Project Recreation Act, 16 U.S.C. 460-1(12), et seq.	Full Compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 601, et seq.	Not Applicable
Land and Water Conservation Fund Act, 16 U.S.C. 460/-460/-11, et seq.	Not Applicable
Marine Protection, Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Not Applicable
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Full Compliance
National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Full Compliance
River and Harbors Act, 33 U.S.C. 403, et seq.	Full Compliance
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Full Compliance
Wild and Scenic Rivers Act, 16 U.S.C. 1271, et seq.	Full Compliance
Flood Plain Management (Executive Order 11988)	Full Compliance
Protection of Wetlands (Executive Order 11990)	Full Compliance
Environmental Effects Abroad of Major Federal Actions (Executive Order 12114)	Not Applicable
Analysis of Impacts Upon Prime and Unique Farmlands (CEQ Memorandum, 11 Aug 80)	Full Compliance
State of Iowa Land-Use Plans	Full Compliance
County Land-Use Plans	Full Compliance
Upper Mississippi Wildlife and Fish Refuge Land-Use Plans	Full Compliance

NOTES

- a. Full Compliance. Having met all requirements of the Statute for the current stage of planning (either preauthorization or postauthorization).
- b. Partial Compliance. Not having met some of the requirements that normally are met in the current stage of planning. Partial compliance entries should be explained in appropriate places in the report and referenced in the table.
- c. Noncompliance. Violation of a requirement of the statute. Noncompliance entries should be explained in appropriate places in the report and referenced in the table.
- d. Not Applicable. No requirements for the statute required; compliance for the current stage of planning.

B. Archaeological/Historical. Consultation was initiated with the Illinois State Historic Preservation Officer (SHPO) in accordance with Section 106 of the National Historic Preservation Act. A letter from the SHPO, dated 30 September 1986, stated that the proposed project was found "to have no effect upon known historic or other cultural resources." The SHPO letter is included in Appendix D - Pertinent Correspondence of the main report.

C. Fish and Wildlife Coordination Act. Coordination with the FWS and the Iowa Conservation Commission has been completed. The Fish and Wildlife Coordination Act Report, dated 4 June 1987, is contained in appendix D of the main report.

Recommendations made in the Fish and Wildlife Coordination Act Report are addressed as follows:

(1) Channel clearing should be limited to the removal of debris and sediment accumulated at bridges.

RESPONSE: The proposed channel modification calls for channel clearing, widening to a 20-foot minimum bottom width and shaping 2:1 minimum side slopes. This will necessitate clearing of some vegetation and debris from the channel between the bridges to ensure that the channel will have the capacity to pass the design flood. Modification measures will be limited to the area between the C&NW Railroad culvert and the bridge at Third Street NE. No modifications are planned in the Wings Park area.

(2) Channel widening should not disrupt the natural meandered channel, or a meandered subchannel be placed in the bottom of the widened channel to provide pools and riffles.

RESPONSE: Channel modification will be constrained by the location of existing structures. Storm sewer lines running beneath the creek further limit the amount of work which can be done in the channel. Modifications should not significantly disrupt the natural pool-riffle sequence.

(3) Plant the widened channel bottom and side slopes to grass species beneficial to wildlife and replace trees removed on a 3:1 basis.

RESPONSE: The channel bottom and side slopes will be replanted with reed canary grass (*Phalaris arundinacea*) for stabilization of banks and to facilitate movement of water through the channel. Canary grass is presently a dominant species in the channel throughout the project area. The overbank right-of-way will be reseeded with a mixture of big bluestem, Indiangrass, little bluestem, and switch grass. This mixture would provide food and cover for birds and small mammals. No mature trees are anticipated to be removed as a result of channel modification; however, if any are removed from the overbank areas during construction, they will be replaced on a 3:1 basis.

(4) Continue investigation of alternate spoil disposal sites to avoid timber clearing or wetland filling.

RESPONSE: Material removed from the channel and side slopes will be deposited on a tract of land on the west side of Oelwein near the Iowa Ham building and the C&NW Railroad tracks. This area is previously cultivated agricultural land left fallow for 15 or more years. Vegetation consists primarily of adventitious forbs, woody shrubs, and scattered trees. While some trees may need to be removed, extensive clearing of forested areas should not be required, and no wetland areas will be used for disposal.

D. Wild and Scenic Rivers Act. Dry Run Creek is not included on the inventory list prepared by the U.S. Department of Interior identifying potential wild and scenic rivers.

E. Executive Order 11988 - Flood Plain Management. Executive Order 11988 directs Federal agencies to: (1) avoid development in the floodplain unless it is the only practical alternative; (2) reduce the hazards and risks associated with floods; (3) minimize the impact of floods on human safety, health, and welfare; and (4) restore and preserve the natural and beneficial value of the floodplain. The proposed project would reduce the flood hazard from Dry Run Creek to an urbanized area within the floodplain. Development within the floodplain is already extensive.

F. Executive Order 11990 - Protection of Wetlands. Executive Order 11990 recognized the significant values provided by wetlands and requires each Federal agency to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. No wetland areas would be altered or destroyed by the proposed project.

G. Clean Water Act. The channel modification activities along Dry Run Creek meet the conditions specified for the Nationwide Permit (NWP 26) described in 33 CFR 330.5(a)(26) (applicable to discharges of dredged or fill material above the headwaters and/or in isolated water bodies), and will not require processing under Section 404 of the Clean Water Act. Comments concerning water quality certification under Section 401 of the Act have been received. (See letter from Iowa Department of Water, Air, and Waste Management, dated 18 July 1986, in appendix D of the main report.) Spoil material will be deposited on a non-wetland portion of the disposal site and stabilized to prevent movement into downstream waterways or wetlands, in accordance with the recommendations of the Iowa Department of Natural Resources (see letter dated 21 January 1987 in appendix D).

H. Clean Air Act. Exhaust emissions and dust from construction vehicles and equipment would be the only contributors to air pollution. No violations to air quality standards are anticipated.

I. National Economic Development (NED) Plan. Channel modification is the NED plan.

J. Farmland Protection Policy Act. The proposed disposal area is located on vacant land which is presently zoned for agricultural use. Coordination with the USDA Soil Conservation Service has been initiated in accordance with the provisions of Section 1541(b) of the Farmland Protection Act.

XII. ENVIRONMENTAL PLANNING.

The following seed mixture is recommended for planting along the stream-banks to provide soil stabilization: reed canary grass (Phalaris arundinacea) in the channel areas; and a mixture of 3.5 pounds big bluestem (Andropogon gerardi), 3.5 pounds Indiangrass (Sorghastrum nutans), 2.5 pounds little bluestem (Andropogon scoparius), and 2.5 pounds switchgrass (Panicum virgatum), per 12 pounds active live seed.

In addition to stabilizing the channel areas, these species would provide food and wildlife cover to birds and small mammals and would be aesthetically pleasing.

The channel area and right-of-way will be mowed on an annual basis, but not prior to August 1st, to ensure protection of ground-nesting species through the incubation and rearing period.

XIII. CONCLUSIONS.

Considering all economic, social, and environmental factors, the channel modification along Dry Run Creek appears to be the best plan for reducing flood problems in Oelwein. The project would have no significant impact on natural or cultural resources.

XIV. COORDINATION. The proposed actions in this Environmental Assessment have been coordinated with the following agencies:

- U.S. Fish and Wildlife Service
- Iowa Conservation Commission
- Iowa State Historic Preservation Officer
- Iowa Department of Water, Air and Waste Management
- U.S. Environmental Protection Agency

In addition, a public workshop was held in Oelwein on 11 February 1986 to discuss the findings of the Reconnaissance Report and to solicit public comments.

FINDING OF NO SIGNIFICANT IMPACT
FOR
DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

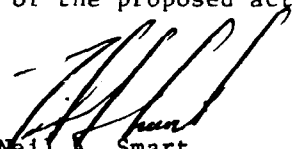
Having reviewed the information provided by this Environmental Assessment, along with the data obtained from cooperating Federal and State agencies having jurisdiction by law or special expertise, and from the interested public, I find that the proposed flood control actions contained within the study would not have a significant adverse effect on the quality of the environment. Therefore, it is my determination that an Environmental Impact Statement is not required. This determination will be reevaluated if warranted by later developments.

Besides "No Action," six structural and nonstructural alternatives were considered.

Factors that were considered in making a determination that an Environmental Impact Statement was not required are as follows:

1. Any negative impacts which would occur have been minimized and/or are temporary in effect; positive impacts are long-term in nature.
2. The action is intended to reduce future disruptions to the well-being and productivity of the area caused by flooding from Dry Run Creek.
3. No significant social, economic, environmental, or cultural impacts are anticipated as a result of the proposed action.

24 June 1967
Date


Neil A. Smart
Colonel, U.S. Army
District Engineer

LIST OF APPENDIXES

- A - HYDROLOGY AND HYDRAULICS
- B - ECONOMIC ANALYSIS
- C - GEOTECHNICAL ANALYSIS
- D - PERTINENT CORRESPONDENCE

HYDROLOGY AND HYDRAULICS

A

P

P

E

N

D

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X

A

DETAILED PROJECT REPORT
FOR
SECTION 205
FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

APPENDIX A
HYDROLOGY AND HYDRAULICS

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DETAILED PROJECT REPORT
FOR
SECTION 205
FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

APPENDIX A
HYDROLOGY AND HYDRAULICS

SECTION 1 - INTRODUCTION

GENERAL

This appendix presents the hydrologic and hydraulic analyses for local flood control along Dry Run Creek in Oelwein, Iowa. The study expands upon previous analyses performed as part of the Reconnaissance Study for Flood Control undertaken by the Rock Island District, Corps of Engineers, and the Flood Study Report for Dry Run, prepared and published by the Soil Conservation Service in March 1982. The study area analyzed in this report covers Dry Run Creek and its floodplain through the city limits of Oelwein. The study area was expanded from previous reports to include the area downstream of Second Avenue SW. to the bridge at Sixth Avenue SW. A general map of the study area is shown on plate 2 in the main text.

CLIMATOLOGY

The climate of Oelwein, Iowa, and the surrounding region is subhumid midcontinental. The annual temperature range is large, with January temperatures averaging about 17 degrees Fahrenheit (F.) and the warmest month, July, averaging 72 degrees F. Mean annual temperature is 46 degrees F.

The average annual precipitation is approximately 34 inches, about 70 percent of which falls from April to September. Areal distribution of rainfall is generally uniform, although summer thunderstorms may produce more intense rainfall in localized areas. Table A-1 shows the climatological data for Oelwein.

TABLE A-1

Climatological Data
for Oelwein, Iowa

<u>Normal Monthly</u> <u>Precipitation</u> <u>in Inches (1941-1970)</u>	<u>Normal Monthly</u> <u>Temperature (Fahrenheit)</u> <u>(1941-1970)</u>	<u>Month</u>
1.64	17.1	Jan
1.01	21.4	Feb
2.15	31.8	Mar
3.26	47.6	Apr
4.36	58.5	May
5.34	68.1	Jun
4.54	72.1	Jul
3.73	70.7	Aug
3.52	61.7	Sep
2.37	52.0	Oct
1.44	35.6	Nov
1.30	22.5	Dec
<u>Normal Total</u> <u>Precipitation</u>	<u>Average Annual</u> <u>Temperature</u>	
34.66	46.59	

BASIN DESCRIPTION

Dry Run Creek is a small, ungaged stream (total drainage area equals 3.03 square miles) which flows into Otter Creek. Otter Creek is a tributary to the Wapsipinicon River which, in turn, flows to the Mississippi River. Watershed topography is that of the glacial "Iowan Erosion Surface," with average slopes of between 2 and 3 percent. Soils in the watershed have moderate water infiltration and transmission characteristics. Land use in the basin is about one-half agricultural and one-half urban. The main stem of Dry Run Creek forms where the runoff from 900 acres of farmland northeast of the city of Oelwein converges, and flows generally southwestward through the city to its confluence with Otter Creek.

A 10-year discharge of 800 cubic feet per second (ft³/s) is the minimum required for consideration by the Corps of Engineers. This minimum discharge is exceeded immediately downstream of East Line Road. Since the floodplain between Eighth Avenue NE. and the Chicago and Northwestern (C&NW) Railroad culvert suffers the most significant damages during floods, the flood damage area is far downstream of the point where the 10-year discharge is 800 ft³/s. Hence, the flood problem warrants investigation by the Corps.

SECTION 2 - DRY RUN CHARACTERISTICS

HISTORICAL FLOODS

Flood problems along Dry Run Creek are most likely the result of thunderstorm-type rainfalls occurring during spring and summer. The major historical flood appears to have been that of 28 August 1979, with an estimated short duration (less than 1 hour) rainfall of 4.25 inches. Public damage resulting from this flood was estimated at over \$760,000. On 22 June 1984, flooding resulted from an estimated rainfall of 2.52 inches in a period of less than 30 minutes. Less spectacular floods resulting from rainfall events of greater than 1 hour duration also have caused inconvenience and damage.

DISCHARGE-FREQUENCY ESTIMATES

Because Dry Run Creek is an ungaged stream, no records were available to estimate flow-frequency. In the Initial Appraisal, discharge values and water surface elevations were obtained from the Flood Study Report published by the Soil Conservation Service. For this study, two methods of analysis were used to obtain discharge values. The first method uses the regression equations developed for the State of Iowa to estimate discharges at the 2-, 5-, 10-, 25-, 50-, and 100-year recurrence intervals (INRC Bulletin No. 11, 1973). The Region I, Model 2 equation bases discharges on drainage basin size and on main channel slope. Results of this analysis are shown on plate A-2.

The second method estimates flows through use of a unit hydrograph generated by Clark's Instantaneous Unit Hydrograph method. The parameters used to generate the hydrograph included drainage area, time of concentration (T_c), and Clark's attenuation constant (R). Two equations for estimating T_c , Kirpich's and Gundlach's (for urbanized basins) were tested. Because of the small drainage area, fairly steep slopes, and relatively small proportion of impervious surface contributing to runoff, the Kirpich equation was used to estimate T_c . The value for R was estimated as $0.67 T_c$; R values for the Rock Island District generally range between 0.6 and 1.0. Using these parameters, the Clark computer program provided values for a 1-hour unit hydrograph, shown on plate A-1.

Rainfall-depth-duration-frequency data for Oelwein were determined from National Weather Service Technical Paper No. 40 and are shown on table A-2. To compute runoff values, initial and uniform loss rates were set at 1.5 and 0.1 inches per hour, respectively. These are values which have generally been used in the Rock Island District. By applying these values to the unit hydrograph, flood hydrographs for the 2-, 5-, 10-, 25-, 50-, and 100-year frequencies were developed for a 12-hour duration storm. Peak discharges from these hydrographs are shown on plate A-2. Discharges

obtained through the two methods were then compared to the values computed by the Soil Conservation Service. The three frequency curves are shown on plate A-2.

Since no stream gage exists on this creek and there are no hourly rain gage data to test the unit hydrograph by reconstructing historic floods, the I-2 equation results were used to develop water surface profiles.

STANDARD PROJECT FLOOD

The Standard Project Flood (SPF) is a deterministic flood based on analysis of regional rainfall characteristics. It can be described as the flood that may be expected from the most severe combination of weather and runoff conditions that are considered reasonably characteristic of the drainage basin, excluding extremely rare conditions. Using the methods outlined in EM 1110-2-1411, Bulletin No. 52-8 (revised March 1965), "Standard Project Flood Determinations," SPF rainfall excess values were developed for the basin. These values were applied to the synthetic unit hydrograph developed for Dry Run Creek to produce the SPF hydrograph. The peak discharge of 4,361 cubic feet per second was used as the SPF value for Oelwein. This hydrograph is shown on plate A-3.

TABLE A-2

Oelwein, Iowa, Point Value Tabulation of Rainfall

Maximum Rainfall Duration In Hours	(1) Rainfall In Inches Depth Corresponding To Various Average Frequencies and Duration in Hours Average Exceedence Interval, In Years						
	1	2	5	10	25	50	100
(a)	MAXIMUM ACCUMULATION OF RAINFALL						
.5	1.05	1.25	1.50	1.75	1.95	2.20	2.50
1	1.25	1.50	1.90	2.20	2.50	2.80	3.10
2	1.50	1.80	2.25	2.65	3.00	3.25	3.70
3	1.65	1.95	2.45	2.80	3.25	3.60	4.00
4	1.75	2.10	2.60	3.00	3.50	3.90	4.30
5	1.85	2.20	2.75	3.20	3.70	4.10	4.55
6	1.90	2.25	2.85	3.30	3.90	4.30	4.75
12	2.25	2.70	3.35	3.90	4.50	5.00	5.60
18	2.50	2.95	3.70	4.30	4.90	5.40	6.10
24	2.65	3.10	3.90	4.50	5.20	5.70	6.40
(b)	RAINFALL BY 1-HOUR INCREMENTS DURING MAXIMUM 6-HOUR ACCUMULATION						
0-1	1.25	1.50	1.90	2.20	2.50	2.80	3.10
1-2	.25	.30	.35	.45	.50	.45	.60
2-3	.15	.15	.20	.15	.25	.35	.30
3-4	.10	.15	.15	.20	.25	.30	.30
4-5	.10	.10	.15	.20	.20	.20	.25
5-6	.05	.05	.10	.10	.20	.20	.20
(c)	RAINFALL BY 6-HOUR INCREMENTS DURING MAXIMUM 24-HOUR ACCUMULATION						
0-6	1.90	2.25	2.85	3.30	3.90	4.30	4.75
6-12	.35	.45	.50	.60	.60	.70	.85
12-18	.25	.15	.35	.40	.40	.40	.50
18-24	.15	.15	.20	.20	.30	.30	.30

WATER SURFACE PROFILES

Water surface profiles for floods of selected recurrence intervals were computed through use of the Corps of Engineers HEC-2 computer program. The program used the backwater computational procedure generally known as the standard step method to calculate the water surface profiles. Cross-sectional information for the backwater analysis of Dry Run Creek was obtained from field surveys performed by the Soil Conservation Service and from topographic maps provided by Associated Engineers. Channel roughness factors (Manning's "n") used in the HEC-2 computer model were chosen by engineering judgment and based on field observations of the channel and floodplain areas. Roughness values of between .020 and .050 for the channel and between .034 and .095 for the floodplain were used for all floods. Starting water surface elevations were assumed to be at critical depth. Water surface profiles were computed for the 2-, 10-, 50-, 100-, and SPF events. These profiles are shown on plate A-4.

The hydraulic analysis of Dry Run Creek also involved the evaluation of flows leaving the main channel and bypassing overland, flowing beneath the C&NW Railroad at the West Charles Street viaduct. Bypass flow occurs when the water surface elevation in the main channel exceeds 638.1 feet NGVD (National Geodetic Vertical Datum of 1929) at the inlet of the C&NW Railroad and Southwest Second Avenue culvert, or 640.1 feet NGVD at the inlet of the Fareway lot culvert. The division of flow was obtained by developing a rating curve for the path the bypass flow would assume. A separate HEC-2 computer model was used to model bypass flows, with the division of flow based on equating the computed flood elevations at the locations where bypass flow could begin.

For most flood events, the discharge in the channel above Charles Street is greater than that above the C&NW Railroad culvert. Table A-3 reveals the effect that the bypass has on channel discharges. (For events more frequent than the 100-year, note the drop in discharge at the location just upstream from the C&NW culvert.)

At Oelwein, future urban growth in the Dry Run Creek drainage basin over the next 50 years is considered to be insignificant (see appendix B, section 5). With no anticipated urban growth, an increase in runoff for future conditions also is considered insignificant. Hence, water surface profiles for future conditions were not computed. Existing conditions profiles also are assumed to be applicable for future conditions.

TABLE A-3

Existing Conditions
Discharge-Frequency/Location
 (Discharge in Cubic Feet Per Second)

<u>Approximate Location</u>	<u>Frequency</u>			
	<u>2-Yr</u>	<u>10-Yr</u>	<u>50-Yr</u>	<u>100-Yr</u>
130' Upstream of C&NW Culvert	384	1,208	2,365	2,989
250' Downstream of 2nd St. & 3rd Ave. NE.	393	1,227	2,383	2,824
140' Upstream of 8th Ave. NE.	320	1,156	2,243	2,824
2,150' Upstream of 8th Ave. NE.	300	959	1,896	2,404

SECTION 3 - ANALYSIS OF PROJECT ALTERNATIVES

INTRODUCTION

The following paragraphs describe the analysis of flood control alternatives. Several alternatives were examined in a preliminary manner, were determined to be infeasible, and were not analyzed in detail. However, the channel modification alternative was analyzed in detail based on preliminary economic feasibility.

CHANNEL MODIFICATION

Eight bridges or culverts span Dry Run Creek from Eighth Avenue NE. to the C&NW Railroad culvert. The degree of channel improvement is limited by the size of the bridge and culvert openings. The bridges at Frederick Avenue and at First Avenue NE. are scheduled to be replaced by the Department of Transportation. Plans for the bridges have been finalized and land acquisition is currently underway. It was assumed that the new bridges will be in place by the time the flood control project is approved for construction, so the new bridge dimensions were input to the backwater model.

Existing homes and businesses adjacent to the creek also limit the amount of channel widening which could be implemented without removal of structures. Consequently, the channel modification alternative examined in this study was that which would produce a reduction of water surface profiles within the constraints of bridges and other existing structures.

The Channel Modification alternative involved uniformly widening the channel to a 20-foot bottom width with 2:1 slopes from the C&NW Railroad culvert to the bridge at Third Street NE. The modified cross sections were input to the backwater deck using the HEC-2 CHIMP routine. Water surface profiles computed for the 2-, 10-, 50-, and 100-year and SPF events are shown on plate A-5.

The results of the Channel Modification analysis show a reduction in the 10-year profile ranging from 0.2 to 1.3 feet for selected cross sections. The channel modification alternative revealed an insignificant reduction in the level of the 100-year and SPF profiles, as well as equivalent flood elevations downstream of the C&NW Railroad culvert. The modified channel between the C&NW Railroad culvert and First Avenue NE. is capable of conveying the 10-year flood within banks. Upstream of First Avenue NE., overbank flooding would occur with flows greater than the 2-year event under the improved channel conditions. This is due, in part, to the inadequate clearance of the proposed bridge at First Avenue NE., the inadequate capacity of the bridge at Second Street and Third Avenue NE., and the shallow depth of the channel upstream of Second Street and Third Avenue NE.

Erosion does not appear to be a major problem along Dry Run Creek under present conditions. Exceptions are: downstream of the bridge at the intersection of Second Street and Third Avenue NE. and downstream of the Frederick Avenue bridge. Velocities at selected cross sections under existing conditions and under the Channel Modification alternative are given in table A-4. Increased channel velocities under project conditions do not appear to be great enough to require placement of riprap in any area other than downstream of the aforementioned bridges. Sediment deposits in bridge culverts could reduce the capacity of the channel. Maintenance of the project would include removal of sediment deposits where necessary.

CONCLUSIONS

Modifications to the channel as previously described, from the C&NW Railroad culvert to the bridge at Third Street NE., would lower the 10-year flood profile in that area by 0.2 to 1.3 feet and would also lower water levels immediately downstream of the railroad culvert. Channel improvements would have less impact on floods of greater magnitude than the 10-year flood. Increasing the channel size beyond a 20-foot bottom width would require modification of bridges and removal of existing structures in some areas.

TABLE A-4

Channel Velocities at Selected Cross Sections
Under Existing and Improved Channel Conditions

		2	10	50	100	SPF
50' D/S of C&NW RR culvert	Existing	4.55	6.16	6.83	7.01	7.03
	Improved	5.22	6.89	7.58	7.77	8.19
	Difference	+ .67	+ .73	+ .75	+ .76	+1.16
75' D/S of First Avenue SW. bridge at bend in creek	Existing	6.00	7.07	6.47	7.08	8.64
	Improved	7.20	5.57	4.12	4.74	5.65
	Difference	+1.20	-2.50	-2.35	-3.34	-2.99
97' D/S of North Frederick Ave. bridge at bend in creek	Existing	8.04	10.98	11.00	11.77	12.60
	Improved	7.57	10.22	11.16	11.07	11.91
	Difference	- .47	- .76	+ .16	- .70	- .69
62' D/S of North Frederick Ave. bridge	Existing	4.29	6.82	10.12	7.57	5.96
	Improved	4.37	6.32	7.94	9.14	7.43
	Difference	+ .08	- .50	-2.18	+1.57	+1.47
20' D/S of First Avenue NE. bridge	Existing	3.92	5.89	6.52	6.66	5.93
	Improved	3.33	5.19	5.58	6.46	7.65
	Difference	- .59	- .70	- .94	- .20	+1.72
10' D/S of Second Street and Third Avenue bridge	Existing	3.14	6.43	8.70	9.79	10.23
	Improved	3.75	7.98	11.03	11.02	11.82
	Difference	+ .61	+1.55	+2.33	+1.23	+1.59
100' D/S of Third Street NE. bridge at bend in creek	Existing	2.55	3.70	5.48	6.28	7.74
	Improved	3.94	5.22	7.13	8.06	9.33
	Difference	+1.39	+1.52	+1.65	+1.78	+1.59
Wings Park area at bend in creek	Existing	2.52	3.33	3.95	4.11	4.38
	Improved	3.35	4.25	5.66	5.91	6.09
	Difference	+ .83	+ .92	+ .71	+1.80	+1.71

RIPRAP DESIGN

The riprap was designed in accordance with procedures obtained in EM-1110-2-1601 and ETL 1110-2-120. The riprap design shear must exceed the local boundary shear. The local boundary shear and riprap design shear were determined assuming a 27-inch layer of riprap. The local boundary shear was determined using the following equation:

$$\tau_o = (1.5) \frac{\gamma \bar{v}^2}{\left(32.6 \log_{10} \frac{12.2y}{D_{50}} \right)^2}$$

Where $\gamma = 62.4$ pcf
 $\bar{v} = 11$ ft/s
 $y = 4.5$ ft (representative depth)
 $D_{50} =$ Max. average stone diameter = 1.5 ft.
1.5 = non-uniform flow factor

$$\tau_o = 4.4 \text{ psf}$$

The riprap design shear was determined using the following equation:

$$\tau' = a (\gamma_s - \gamma) D_{50} \left(1 - \frac{\sin^2 \phi}{\sin^2 \phi_r} \right)^{0.5}$$

Where $a = 0.040$
 $\gamma_s = 165$ pcf
 $\gamma = 62.4$ pcf
 $D_{50} =$ min. average stone diameter = 1.3 ft.
 $\phi =$ angle of side slope with horizontal for a side slope of 2H:1V
 $\phi_r =$ riprap angle of repose = 40°

$$\tau' = 4.3 \text{ psf} \approx 4.4 \text{ psf} \therefore \text{O.K.}$$

The following is the required minimum riprap gradation:

<u>% Lighter</u> <u>By Weight</u>	<u>Limits of</u> <u>Stone Wt., Lbs.</u>
100	984-394
50	292-197
15	146-62

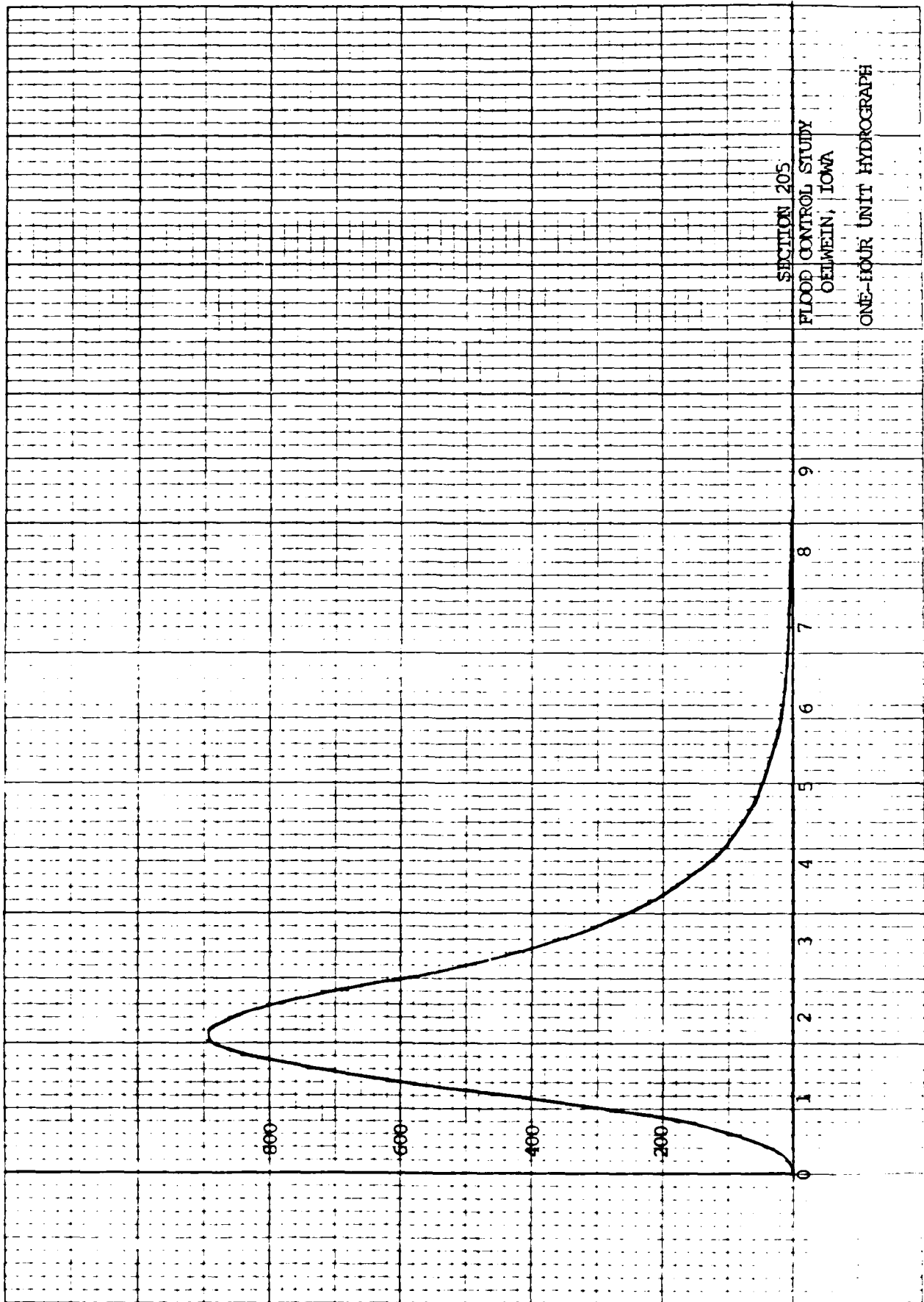
The riprap blanket thickness would be 27 inches; The toe of the riprap blanket should extend at least 11 feet from the base of the bank at a thickness of 3 feet. The slope of the riprap blanket should be no steeper than 2H on 1V. The downstream end of the riprap blanket should extend beyond the site of eroding velocities or else keyed into the bank.

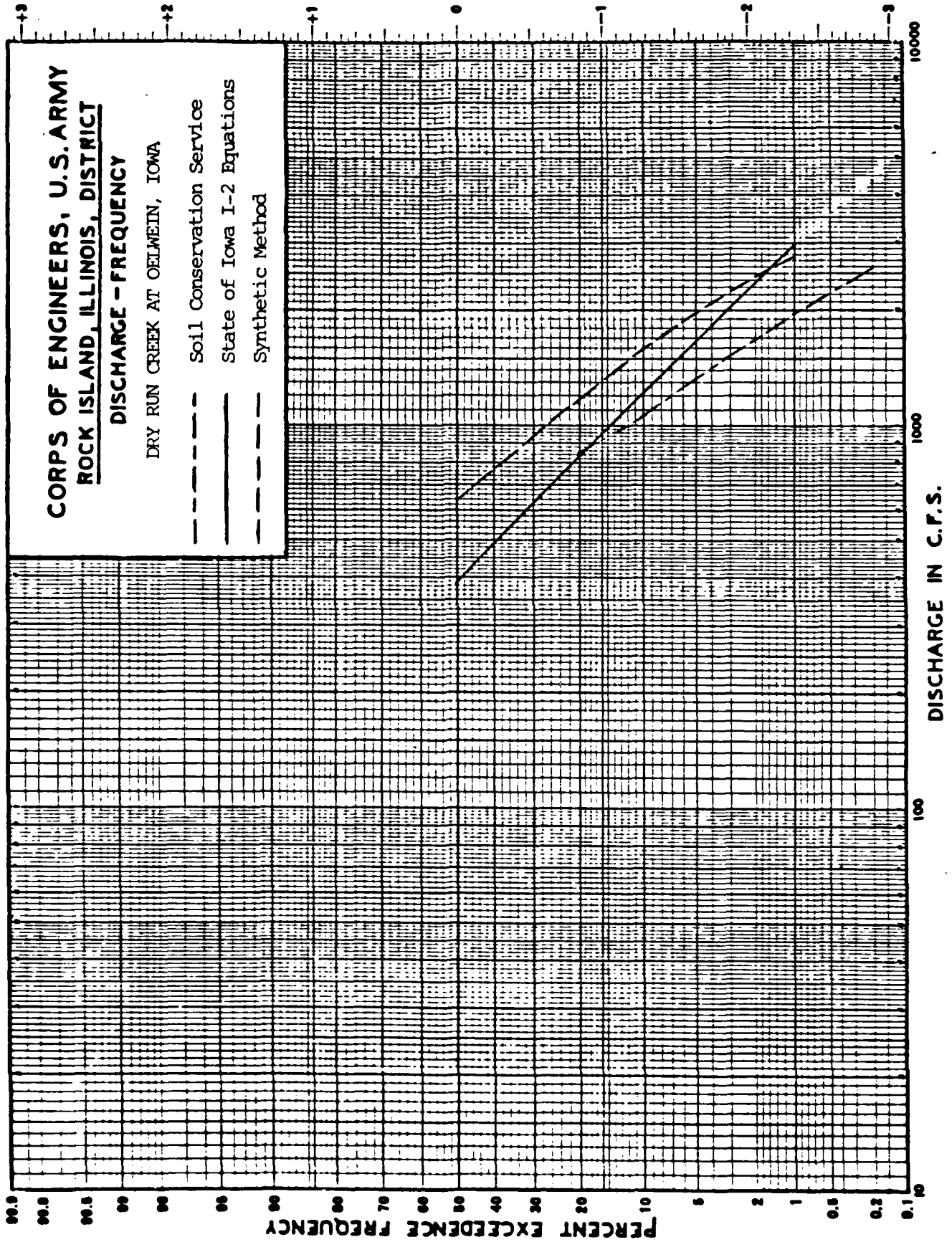
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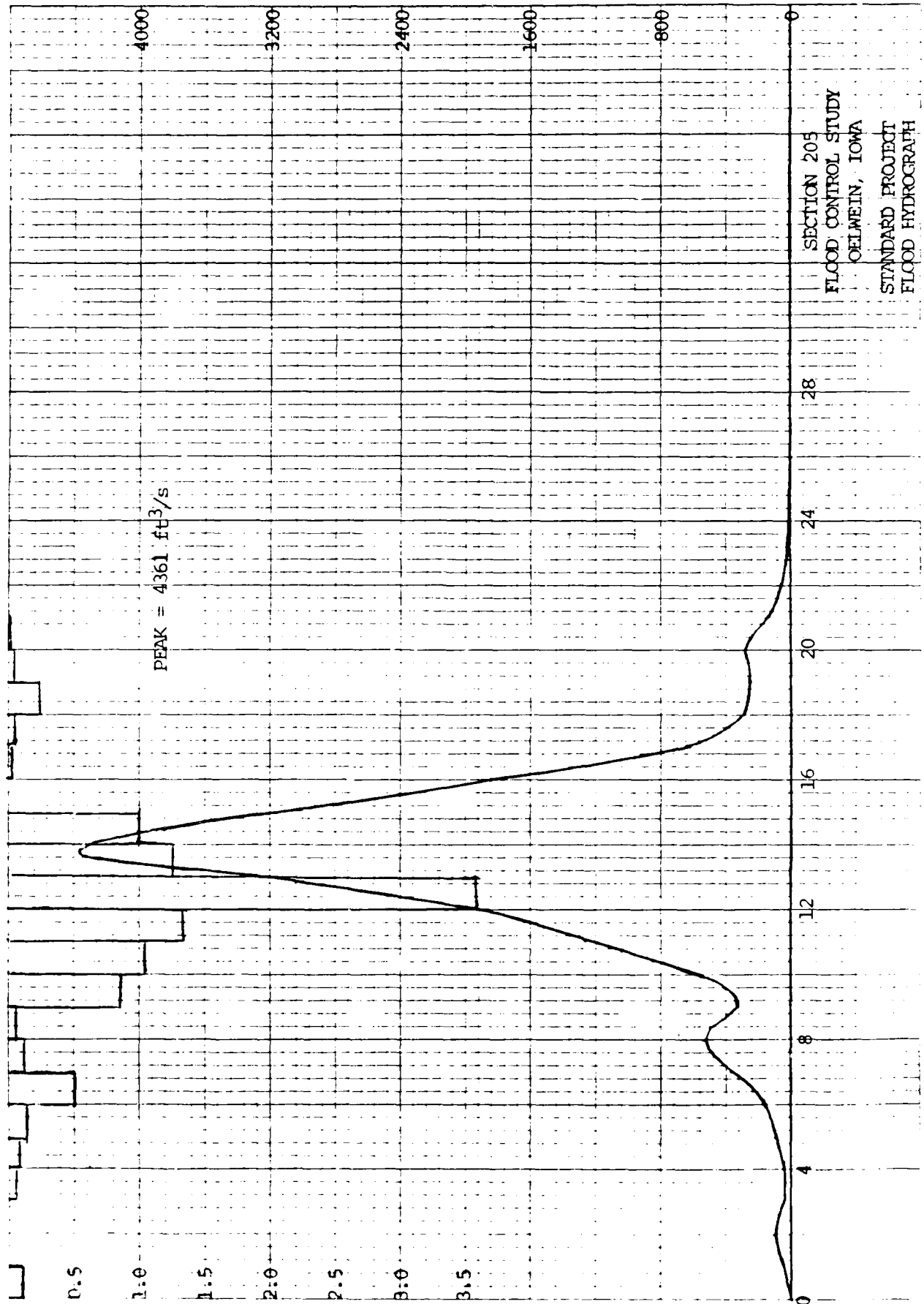
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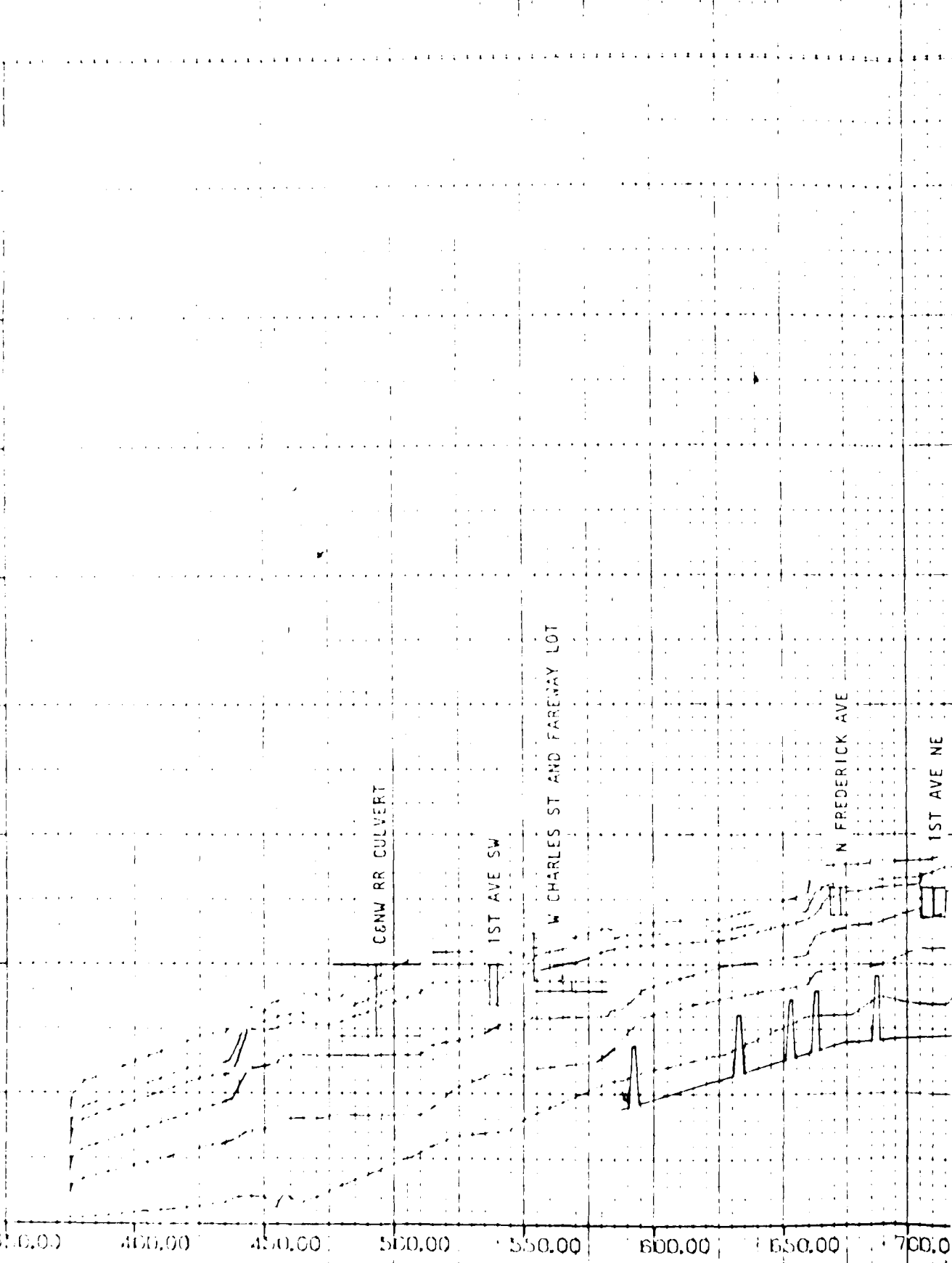
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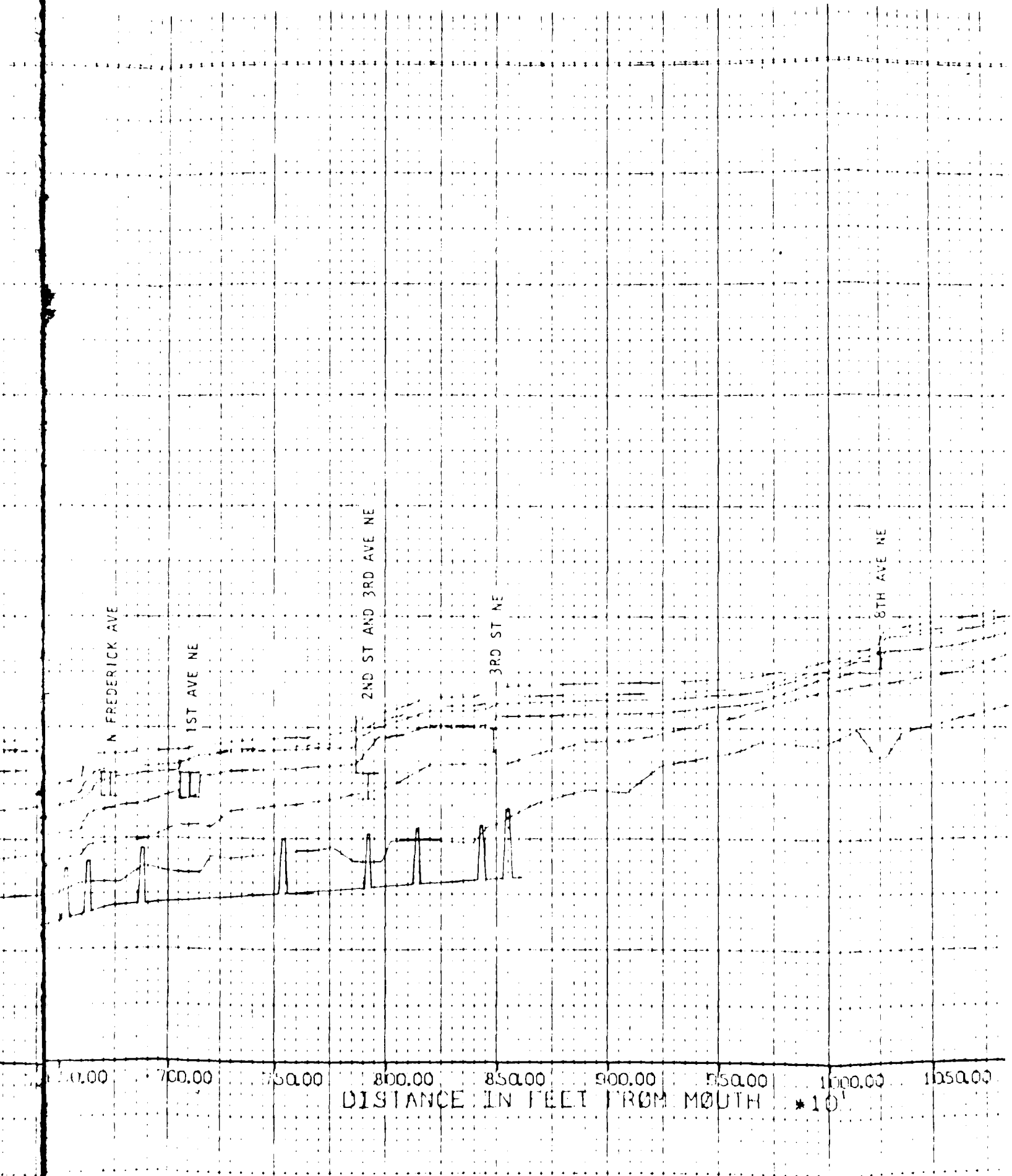






PLAN OF THE CITY OF ST. LOUIS, MO.
SECTION 10, TOWNSHIP 10 N., RANGE 10 E., 1855





WATER SURFACE PROFILES

EXISTING CONDITIONS

8TH AVE NE

LEGEND

- STREAMBED
- - - 2-YR
- - - 10-YR
- - - 50-YR
- - - 100-YR
- SPF
- SANITARY SEWER & MANHOLE

900.00 950.00 1000.00 1050.00 1100.00 1150.00 1200.00 1250.00
FROM MOUTH *10'

ELEVATION IN FEET (NGVD)

1020.00 1030.00 1040.00 1050.00 1060.00 1070.00 1080.00 1090.00 1100.00 1110.00



N FREDERICK AVE

1ST AVE NE

2ND ST AND 3RD AVE NE

3RD ST NE

8TH AVE NE

650.00

700.00

750.00

800.00

850.00

900.00

950.00

1000.00

1050.00

DISTANCE IN FEET FROM MOUTH

10

WATER SURFACE PROFILES

CHANNEL MODIFICATION

8TH AVE NE

LEGEND

—

STREAMBED

- - -

2-YR

- - - -

10-YR

- . - .

50-YR

- - - -

100-YR

- - -

SPE

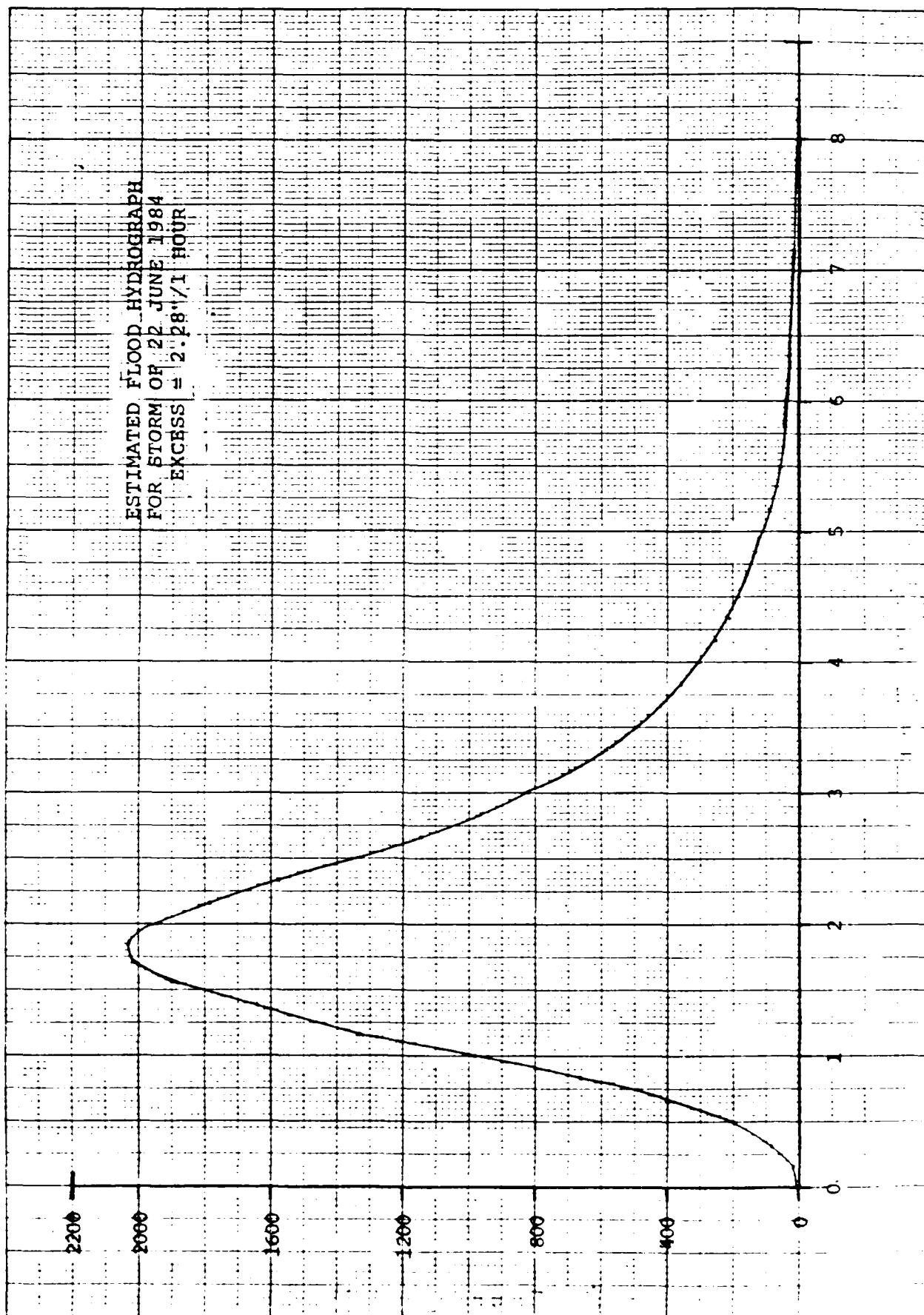
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SANITARY SEWER & MANHOLE

900.00 850.00 1000.00 1050.00 1100.00 1150.00 1200.00 1250.00
FROM MOUTH 10'

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ECONOMIC ANALYSIS

A

P

P

E

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D

I

X

B

DETAILED PROJECT REPORT
FOR
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FLOOD CONTROL PROJECT

DRY RUN CREEK
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APPENDIX B
ECONOMIC ANALYSIS

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FOR
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DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

APPENDIX B
ECONOMIC ANALYSIS

SECTION 1 - INTRODUCTION

PURPOSE

This appendix documents the economic studies performed to analyze possible methods of reducing flood damage along a 1.1-mile reach of Dry Run Creek within the city of Oelwein, in Fayette County, Iowa. The selected study reaches represent areas with damage potential sufficient to warrant a study involving methods of protecting properties against damaging flows of the creek. These study reaches are shown on plate B-1. The stream/flow relationships used are discussed in Appendix A - Hydrology and Hydraulics of this report.

SECTION 2 - BACKGROUND INFORMATION

THE PROBLEM AREA

Dry Run Creek flows through residential and business areas of Oelwein. Plate B-1 also indicates the location of various land uses of the floodplain. Both sides of the creek are subject to flooding. Therefore, each study reach was divided into left and right bank sections and studied separately.

HISTORICAL FLOODING

The flood of record occurred on 18 August 1979. This flood resulted from 4.25 inches of rain over Fayette County which corresponded to a greater than 50-year storm frequency as determined by the Corps of Engineers. The most recent flood, which occurred on 22 June 1984, resulted from 2.52 inches of rain falling on the city during the night. High water marks recorded indicate that the flood was of approximately a 25-year frequency level.

The damage that occurred during the 1979 flood was increased by factors other than those caused by overbank flows of the creek. Damage was compounded by high winds and saturated soil conditions resulting from the rainstorms that occurred in the floodplain during the time that the creek flooding occurred. Many businesses, homes, and public buildings sustained water damage. Homes with basements appeared to have incurred the greatest damage, with a number of homes suffering basement wall collapse. Basement contents of a church were extensively damaged when a basement wall collapsed. According to newspaper descriptions, floodwater filled the West Charles Street viaduct. The engine room floors of the firehall were covered with water. Streets in the business district were filled to a depth of up to 3 feet, resulting in floating cars which were swept by the current into the creek, blocking creek flows just upstream of the First Avenue NW. culvert and raising flood heights upstream to Frederick Avenue North. There were over 200 telephone requests for power turnoffs because of water in basements. In some areas, within 20 minutes waters rose with little warning to flooding heights.

The damage that occurred during the June 1984 flood resulted in overbank flows along Dry Run Creek and 45-miles-per-hour winds that littered streets with broken trees and branches. Water in basements, power outages, and submerged cars were the main problems reported.

No damage data are available for the 1979 flood. Preliminary surveys were made for the 1984 flood, but complete results are not available because, in many cases, flood damage repairs and/or restoration have not been made.

The damage curves derived for the analysis used in this economic appendix were used to estimate flood damage from Dry Run Creek. At current price levels, damages are estimated at \$762,000 and \$373,000 for the 1979 and 1984 flood levels, respectively. These figures may be too low for existing conditions because water surface profiles generated for various flood levels studied were based upon future intent of the Iowa Department of Transportation to construct new bridges at Frederick Avenue North and First Avenue NW.

Less spectacular floods have occurred many times, causing many inconveniences and damage. Constricting bridges and debris accumulations have contributed to these floods.

SECTION 3 - DAMAGE POTENTIAL

DAMAGE REACHES

Damage potential was estimated by a study of eight reaches along the creek (plate B-1). The anticipated average annual damage for these reaches is shown on table B-1.

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DETAILED REPORT OF THE PROCEEDINGS OF THE TRIAL OF
PROSECUTOR GENERAL, RE U.S. ARMY ENGINEER DISTRICT ROCK
ISLAND, ILL. JUN 3

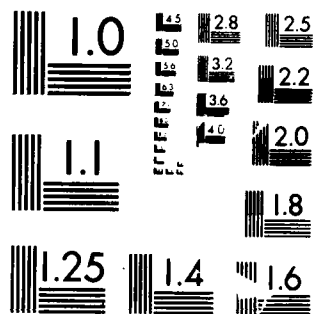
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TABLE B-1

Damage Potential by Study Reach

Reach Number	Reach Location	Number of Structures				Existing Conditions Average Annual Damage (\$1,000)
		Residential	Average Value (\$1,000)	Commercial	Public	
1	West city limits to C&NW RR tracks	3	30.0	0	0	0.0
2	C&NW RR tracks to Charles St. cross.	1	75.0	17	1	3.7
3	Charles St. cross. to Frederick Ave. crossing	11	47.4	5	1	19.3
4	Frederick Ave. crossing to First Ave. crossing	12	78.7	20	4	20.4
5	1st Ave. crossing to 2nd Ave. crossing	8	71.6	0	0	4.0
6	2nd Ave. crossing to 4th Ave. crossing	35	33.6	0	1	17.6
7	4th Ave. crossing to 6th Ave. crossing	20	29.1	0	0	6.1
8	6th Ave. crossing to 8th Ave. crossing	4	36.6	0	1	0.8
TOTALS		94		42	8	71.9

SECTION 4 - ECONOMIC ANALYSIS

PURPOSE

The purpose of the economic analysis is to compute benefits and costs for several alternatives to aid in the selection of the most cost-efficient plan.

METHODOLOGY

Benefits and annual costs are used to compute benefit-cost ratios (benefits divided by costs) and net benefits (benefits minus costs). When considering an array of project alternatives and respective net benefits, the greatest net benefit is an indication of optimum return on the investment. Annual benefits are computed from project effects upon reducing inundation depths. Costs are converted to annual equivalents considered over the period of analysis (project life). The methodology considers engineering, economic, environmental, and social factors.

An 8-5/8 percent interest rate and a 50-year period of analysis were used for discounting purposes during the process of computing benefits and also in converting project costs to annual charges.

Computed benefits represent average annual damage (AAD) reductions that each plan was expected to produce. The procedure involves the process of deriving curves depicting damage versus frequency of occurrence relationships at various flow levels of the stream. These are developed under existing versus project conditions, and then AAD's are computed for each condition. Benefits (damage reductions) are computed by subtracting AAD occurring under "with-project" conditions from that occurring under "without project" conditions.

Backwater profiles used to compute "with" and "without" project AAD's assume new bridges, planned for construction in the near future, to be in place.

PRELIMINARY SCREENING

In the preliminary screening process, total average annual damages for the eight reaches were used to test various higher level projects. The procedure assumes that each project tested will give 100 percent reduction of the total damages shown by table B-1. Although this assumption is not realistic, it saves the time and effort of computing individual benefits for each project. If the benefit-cost (B/C) ratio is less than unity under the assumption, it would clearly be less than unity if the benefit were computed and used. Therefore, further analysis would not be required. This type of screening was used for 10 protective measures listed as follows:

<u>Item</u>	<u>AAD (\$1,000)</u>	<u>Annual Costs (\$1,000)</u>	<u>B/C Ratio</u>
1) Upstream floodwater storage basin	71.9	82.6	0.9
2) Concrete floodwall (100-year)	71.9	200.0	0.4
3) Concrete floodwall (5-year)	71.9	150.9	0.5
4) 100-year levees and floodwalls	71.9	199.9	0.4
5) 50-year levees and floodwalls	71.9	139.4	0.5
6) Earthen levee (50-year)	71.9	80.9	0.9
7) Excavated pit storage basin (5-year)	71.9	639.0	0.1
8) Concrete-lined channel (100-year) (rectangular cross section)	71.9	134.9	0.5
9) Railroad culvert modification*	23.0	25.0	0.9
10) Channel Modification**	71.9	24.5	3.0

* Benefits accrue in reaches 2 and 3 only.

** AAD's were converted to benefits with results shown on table B-12.

Special considerations for reaches 6 and 7 were considered possible. Actual benefits versus annual costs were used for the reaches as follows:

<u>Item</u>	<u>Benefit (\$1,000)</u>	<u>Annual Costs (\$1,000)</u>	<u>B/C Ratio</u>
Combination of alternatives: (Channel Modification with 3-foot high levee) reach 6	9.1	16.0	0.6
Combination of alternatives: (Channel Modification with 3-foot-high levee) reach 7	1.3	3.0	0.4

The procedure indicated that any type of levee combined with channel modifications would not be feasible. For channel bottom widths wider than 20 feet, right-of-way requirements would necessitate relocation of residential

or business establishments with substantial increase of project costs. Increase of benefits would be minimal because of the hydraulic restrictions of the bridges in the study reaches. Therefore, B/C ratios would clearly be less than 1.

Therefore, Channel Modification (shown as item 10 above) is the only plan identified as having the possibility of being feasible.

Benefits by reach for the plan are shown on table B-2.

TABLE B-2

Benefits by Reach
for
Channel Modification
(Existing Conditions)

<u>Reach</u>	<u>AAD</u> <u>(\$1,000)</u>	<u>AAD</u> <u>with Project</u> <u>(\$1,000)</u>	<u>Benefits</u> <u>with Project</u> <u>(\$1,000)</u>
1	0.0	0.0	0.0
2	3.7	3.1	0.6
3	19.3	14.0	5.3
4	20.4	9.8	10.6
5	4.0	1.4	2.6
6	17.6	6.3	11.3
7	6.1	3.6	2.5
8	0.8	0.3	0.5
TOTALS	71.9	38.5	33.4

The screening procedure has only indicated a possibility of feasibility for the Channel Modification project. Therefore, an analysis and discussion are forthcoming to provide a basis for indicating the degree of acceptability of the project.

Because of the restrictions in the size of a channel improvement project that can be considered, the usual method of computing a net benefits curve for various design levels is not needed.

FLOOD DAMAGE

Flood damage curves derived from data collected were adjusted to represent damages expected from a small, flashy stream. Because of the rapid rise of floodwater, adequate floodwarning is not given, preventing emergency preparations such as sandbagging the openings of buildings or evacuating their contents. Therefore, damages from various inundation depths are higher than those expected from floods of the average stream.

Hydraulic analyses determined that flood flows would leave the main channel at West Charles Street. This bypass of flow results in channel flows being greater above West Charles Street bridge than those above the Chicago and Northwestern (C&NW) railroad culvert. The damage potential of Reach 2 includes the effect of breakout flow. The damage attributable to breakout flow is a small percentage of the total damage listed by table B-1 for the reach.

DATA COLLECTION

Data were collected regarding damageable properties of the floodplain. Such data are used to determine amounts of damage for various levels of flooding. For business establishments, information such as the value of plant, equipment, and inventory and the amounts of physical damage that would probably occur from various depths of flooding were collected using interviews combined with onsite observations and measurements. Floor elevations were measured with a hand level to carry elevation relationships from a known source, or benchmark. For business establishments, the location and damageable value of contents were estimated to provide a basis for damage curves produced for each business.

Data collected pertaining to residential housing were organized in a form adapted to computer input -- namely, house location, value, type of structure, and ground and floor elevations. As a result of the area's depressed economy, market values were not representative of repair costs. Benchmark values for types and sizes of houses were obtained through interviews with real estate firms, using their experience and their lists of current prices and sales for existing houses in the city. These values were related to homes listed in the floodplain and market values were assigned. Corresponding known values for homes of similar type and size were used to develop adjustment factors representing a value that depicted a relationship to normal damage curves. These were then used to derive the house values used in the analysis.

DAMAGE CURVES

Damage curves are used to establish a basis of representing damage expected for a range of floodwater elevations. These elevations are related to a water surface profile produced by the river or stream for each flood being considered.

DAMAGE REACHES

Each structure in the floodplain is related to the profile of the stream. Because the study limitation precludes an analysis of each structure, a number of reaches are designated along the stream, each representing the total of the damage relationship. The primary basis of selection was hydraulic and land use uniformity within the reach.

Reaches were selected for Dry Run Creek using the principle of hydraulic uniformity. Land use uniformity was no problem because Reaches 2 and 3 are predominately of commercial usage and Reaches 4 through 8 are predominately residential usage. Index stations are those point locations within the reach that are considered to represent average damage for each land-use category.

Each index station was located along the creek at the halfway point of the reach and represented total damage relationships. A frequency curve also was developed for each index station and was combined with the damage curve to derive the damage-frequency curve used to compute average annual damages (AAD) and associated benefits.

Individual damage curves were combined to produce total damage curves for each land-use category. Residential damage information was tabulated in table B-3. Since there were no manufacturing establishments subject to flooding, a table of industrial damage is not displayed. Table B-4 tabulates commercial and public damage. Table B-5 tabulates sewer and street damage.

Benefits described in paragraphs that follow represent two conditions: those that represent damage reduction during existing conditions and additional benefits occurring under future conditions.

INUNDATION BENEFITS

Inundation benefits are computed by integrating damage curves with frequency curves to produce average annual damage. These benefits were computed as follows:

Index stations were selected for each reach, and corresponding rating curves were developed which, when combined with discharge-frequency curves, produced elevation-frequency curves. These were combined, in turn, with elevation-damage curves representing damageable properties of the floodplain to produce the damage-frequency curves used to compute average annual damage. The average annual damage with the project, subtracted from average annual damage without the project, represents the damage reductions (or benefits) for the floodplain.

TABLE B-3

Residential Damage by Reach

Elevation (NGVD)	Frequency R-1 (%)	Damage R-1 (\$1,000)	Frequency R-2 (%)	Damage R-2 (\$1,000)	Frequency R-3 (%)	Damage R-3 (\$1,000)	Frequency R-4 (%)	Damage R-4 (\$1,000)	Frequency R-5 (%)	Damage R-5 (\$1,000)	Frequency R-6 (%)	Damage R-6 (\$1,000)	Frequency R-7 (%)	Damage R-7 (\$1,000)	Frequency R-8 (%)	Damage R-8 (\$1,000)
1018.0	2.0	0.0														
1019.0	0.5	1.8														
1020.0	0.1	2.6														
1038.0																
1039.0																
1040.0			1.0	0.0	10.0	0.0										
1041.0			0.1	3.6	5.5	14.0										
1042.0					2.0	30.4										
1043.0					0.7	77.0										
1044.0					0.1	113.2	7.0	0.0	42.0	0.0						
1045.0							4.0	8.1	26.0	4.6						
1046.0							2.0	16.6	14.0	5.6	56.0	0.0				
1047.0							0.6	31.3	6.0	18.5	46.0	2.0				
1048.0							0.1	56.2	2.0	27.2	30.0	6.8				
1049.0									0.3	51.4	20.0	26.8	54.0	0.0		
1050.0									0.1	59.6	12.0	67.6	40.0	2.2		
1051.0											5.0	113.6	15.0	8.2		
1052.0											1.0	192.5	5.0	18.8	97.0	0.0
1053.0											0.1	301.9	1.6	32.4	90.0	0.2
1054.0													0.2	80.9	10.0	0.3
1055.0													0.1	91.1	3.0	1.9
1056.0															0.1	5.0

TABLE B-4

Commercial and Public Damage By Reach
Existing Conditions

Elevation (NGVD)	Frequency R-2 (%)	C O M M E R C I A L						P U B L I C								
		Damage R-2 (\$1,000)	Frequency R-3 (%)	Damage R-3 (\$1,000)	Frequency R-4 (%)	Damage R-4 (\$1,000)	Frequency R-2 (%)	Damage R-2 (\$1,000)	Frequency R-3 (%)	Damage R-3 (\$1,000)	Frequency R-4 (%)	Damage R-4 (\$1,000)	Frequency R-6 (%)	Damage R-6 (\$1,000)	Frequency R-8 (%)	Damage R-8 (\$1,000)
1038.0	2.4	0.0														
1039.0	1.5	29.7								20.0	0.0					
1040.0	1.0	139.7	10.0	0.0			1.0	0.0	10.0	36.3						
1041.0	0.1	391.6	5.5	22.0			0.1	33.0	5.5	44.0						
1042.0			2.0	192.5					2.0	48.4						
1043.0			0.7	306.9					0.7	55.0						
1044.0			0.1	374.0					0.1	63.8						
1045.0						7.0	0.0									
1046.0						4.0	91.3									
1047.0						2.0	299.2				2.0	0.0				
1048.0						0.6	616.2				0.6	84.1				
1049.0						0.1	875.0				0.1	162.8				
1050.0																
1051.0																
1052.0													1.0	0.0		
1053.0													0.1	114.4		
1054.0															26.0	0.0
1055.0															3.0	1.6
1056.0															0.1	5.5

TABLE B-5

Sewer and Street Damage by Reach
Existing Conditions

Elevation (NGVD)	R-1 (%)	Frequency R-1 (\$1,000)	R-2 (%)	Frequency R-2 (\$1,000)	R-3 (%)	Frequency R-3 (\$1,000)	R-4 (%)	Frequency R-4 (\$1,000)	R-5 (%)	Frequency R-5 (\$1,000)	R-6 (%)	Frequency R-6 (\$1,000)	R-7 (%)	Frequency R-7 (\$1,000)	R-8 (%)	Frequency R-8 (\$1,000)
1018.0	2.0	0.0														
1019.0	0.5	1.0														
1020.0	0.1	2.2														
1038.0			1.1	0.0	10.1	0.0										
1040.0			1.0	2.0	10.0	3.0										
1041.0			0.1	3.0	5.5	6.0										
1042.0					2.0	6.5										
1043.0					0.7	7.0	7.1	0.0	42.1	0.0						
1044.0					0.1	7.0	7.0	3.0	42.0	3.0						
1045.0							4.0	4.0	26.0	4.0	56.1	0.0				
1046.0							2.0	5.0	14.0	4.0	56.0	0.5				
1047.0							0.6	10.0	6.0	5.0	46.0	1.0				
1048.0							0.1	22.0	2.0	5.0	30.0	3.1	54.1	0.0		
1049.0									0.3	6.0	20.0	12.0	54.0	1.0		
1050.0									0.1	6.0	12.0	12.0	40.0	2.0		
1051.0											5.0	13.0	15.0	7.0	97.1	0.0
1052.0											1.0	13.0	5.0	12.0	97.0	0.1
1053.0											0.1	14.0	1.6	18.0	90.0	0.2
1054.0													0.2	23.0	10.0	0.2
1055.0													0.1	30.0	3.0	0.8
1056.0															0.1	2.0

TYPE OF PROTECTION

Structural and nonstructural alternatives were studied. The structural alternative uses channel improvements to reduce flood heights in the floodplain. The nonstructural solutions apply preventive measures to homes and business structures as a means of preventing damage.

Business establishments were not considered likely candidates for relocation or evacuation measures, as described later in this report. Also, they were not considered for floodproofing because of the flashy nature of the creek. However, nonstructural measures were analyzed for 13 homes located below the 30-year flood level.

SECTION 5 - STRUCTURAL MEASURES

TYPES OF BENEFITS

The paragraphs that follow describe benefits that can be credited to structural measures used to reduce or prevent damage.

Examples of benefits under existing conditions of development are benefits resulting from the reduction of physical damage to buildings and their contents, business loss, the costs of emergency operations, and the administration of flood insurance. Another example is the future growth increase benefits that result from the anticipated damage or losses prevented in the future.

PHYSICAL LOSS BENEFITS

These benefits result from decreased inundation of properties or items that are damageable when brought into contact with water. This damage is equated to the cost necessary to restore these properties to their original condition. When inundation is reduced or prevented by a project, the damage is reduced or eliminated, and benefits are credited to the project.

Benefits by land-use category under existing conditions of development are shown on table B-6 for channel modification. The table also indicates amounts of AAD and residual damage.

TABLE B-6

Benefits and Damages (Existing Conditions)
(\$1,000)

Channel Modification	Reach Number								Total
	1	2	3	4	5	6	7	8	
Residential Benefit									
Structure	0.0	0.0	1.2	0.3	1.1	6.8	1.0	0.1	10.5
Contents	0.0	0.0	0.2	0.1	0.3	2.8	0.4	0.0	3.8
Commercial Benefit	0.0	0.5	2.2	8.6	0.0	0.0	0.0	0.0	11.3
Public Benefit	0.0	0.1	1.4	1.3	0.0	0.4	0.0	0.2	3.4
Street & Sewer Benefit	0.0	0.0	0.3	0.3	1.2	1.3	1.1	0.2	4.4
Residential AAD	0.0	0.0	2.4	0.7	2.3	13.3	3.0	0.2	21.9
Residual Residential AAD	0.0	0.0	1.0	0.3	0.9	3.7	1.6	0.1	7.6
Commercial AAD	0.0	3.5	9.9	16.3	0.0	0.0	0.0	0.0	29.7
Residual Commercial AAD	0.0	3.0	7.7	7.7	0.0	0.0	0.0	0.0	18.4
Public AAD	0.0	0.2	6.4	2.0	0.0	0.7	0.0	0.4	9.7
Residual Public AAD	0.0	0.1	5.0	1.7	0.0	0.3	0.0	0.2	7.3
Street and Sewer AAD	0.0	0.0	0.6	0.4	1.7	3.6	3.1	0.2	9.6
Residual St. & Sewer AAD	0.0	0.0	0.3	0.1	0.5	2.3	2.0	0.0	5.2
Total Benefits	0.0	0.6	5.3	10.6	2.6	11.3	2.5	0.5	33.4
Total Residual AAD	0.0	3.1	14.0	9.8	1.4	6.3	3.6	0.3	38.5
Total AAD	0.0	3.7	19.3	20.4	4.0	17.6	6.1	0.8	71.9

EMERGENCY OPERATION BENEFITS

Emergency operation benefits are based upon emergency costs incurred during flooding. Existing costs recorded during the 1979 flood were used as a basis to derive an emergency cost curve for the range of flooding. The emergency costs are equivalent to damage which, when correlated with frequency of occurrence, can be used to derive annual benefits. Approximately \$152,000 of emergency operation damages were recorded for the 1979 flood. Benefits were computed using 1979 flood damage as a plotting point and the damage curve shape for other similar Corps projects. Resulting benefits were \$2,500 for the Channel Modification plan.

BUSINESS LOSS BENEFITS

Business loss benefits result from business shutdowns that occur during the flooding and during cleanup periods after the flooding. Methods of computing business loss are under study at present and, therefore, this

type of loss is not included in the economic analysis for Dry Run Creek's floodplain. Preliminary estimates indicate that the omission of business loss benefits will not significantly impact results.

FLOOD INSURANCE BENEFITS

Benefits described in previous paragraphs are those resulting from flood-water inundation and occurrence under existing conditions of land development. Flood insurance benefits are considered to occur under existing conditions but are not directly related to floodwater inundation.

Flood insurance benefits occur when protection eliminates the administrative costs of the National Flood Insurance Program. The number of houses in the 100-year floodplain for the selected plan is shown in table B-7, with corresponding flood insurance benefits indicated. Benefits are based upon administrative costs of \$67.00 per house each year.

TABLE B-7

Flood Insurance Benefits by Reach

Number of Homes in the 100-year Floodplain	Reach Number								Total
	1	2	3	4	5	6	7	8	
1) Under existing conditions	0	0	11	12	8	34	17	2	84
2) With channel modification difference	0	0	11	10	8	24	17	2	72
	0	0	0	2	0	10	0	0	12
DIFFERENCE x \$67.00/Home									
Channel Modification Benefits	0	0	0	134	0	670	0	0	804

Table B-6 reveals that very little is accomplished by the project in removing the 100-year floodplain status from houses. Channel modification removes the status from 12 houses, resulting in \$804.00 of flood insurance benefit.

FREEBOARD BENEFITS

Since levees and floodwalls are not involved in the channel modification, there are no freeboard benefits.

FUTURE GROWTH BENEFITS

Increased damage from future flood events is expected when properties experience an increase in value of damageable properties during future years. In addition to increased damage to the structure and contents of existing establishments, there may be damage to new structures that will occupy currently unoccupied land. If this future change occurs as a result of existing development trends, then an analysis of increased flood damage is used. If the change is induced as a result of the project reducing the flood hazard, then the beneficial effects of land enhancement are analyzed as location benefits.

At Oelwein, the historical information summarized in tables B-8 and B-9 was used as an indication of future trends. According to the city of Oelwein, there has been no change in the number of businesses existing in the Dry Run Creek basin during the 1975-1985 period, and a minimal number of housing units has been added. The 1984 State of Iowa Projections projects a 7 percent decline in population for Fayette County through year 2000. Therefore, it is assumed that no future growth in the number of houses or businesses will occur for the Dry Run Creek floodplain and no basis exists for this type of benefit.

TABLE B-8

Population of Oelwein, Iowa
(From U.S. Census)

<u>Year</u>	<u>Population</u>	<u>Percent Change</u>
1960	8,282	-6.6
1970	7,766	-2.7
1980	7,564	—
TOTAL CHANGE	-718	-9.3

TABLE B-9

Number of Housing Units in the Dry Run Creek Drainage Basin
(Assuming 3 Persons Per House and 76% Live in Drainage Basin)

<u>Years</u>	<u>No. Houses in Basin</u>	<u>Change in No. Houses</u>	<u>% Change</u>
1975	1914	+2	+0.10
1980	1916	+6	+0.31
1985	1922	—	—
	TOTAL	+8	+0.41

SOURCE: City of Oelwein

Future increase of impervious types of surfaces in the Dry Run Creek drainage basin is considered not to be enough to significantly increase future runoff. Therefore, increase in damage from future increase of runoff is not anticipated.

RESIDENTIAL GROWTH BENEFITS

Although growth in the number of residential homes is not anticipated, growth in the value of residential contents of existing homes is considered to occur from the increased affluence of residents. This growth was assumed to increase in proportion to per capita personal income. A compound growth rate of 1.93 percent from 1980 OBERS BEA Economic Area 101 was used, an economic area which includes Fayette County and also the city of Oelwein. The "no change in share" rate was used because U.S. census of past population indicated that the population of Fayette County was changing at a slower rate than that of the State. Growth of residential contents was limited to 75 percent of the value of residential structures. Using this procedure, the maximum content value was computed to occur in 41 years.

COMMERCIAL GROWTH BENEFITS

Growth in the number of business establishments is not anticipated. Growth considered for existing business would be the result of possible modernization and improvement of existing facilities. Interviews with business representatives and owners revealed no indication of future plans of this nature.

Although the negative response is considered to be a result of present problems with the economy and therefore of short-term duration, a possible turnaround in the economy and the public attitudes cannot be assumed. Therefore, commercial growth benefits were not credited to the project.

PUBLIC GROWTH BENEFITS

Support of future public growth in the protected floodplain is considered to be minimal. Therefore, future growth of public facilities was not included in the analysis.

PROJECTIONS BY DECADE

Projections of residential benefits by decade for the Channel Modification project are shown by table B-10.

TABLE B-10

Projection of Future Benefits (\$1,000)
Channel Modification

	<u>Year</u>	<u>Structure</u>	<u>Contents</u>	<u>Total</u>
Base Yr	1985	10.5	3.8	14.3
	1988	10.5	4.0	14.5
	1998	10.5	4.9	15.4
	2008	10.5	5.9	16.4
	2018	10.5	7.1	17.6
	2026	10.5	7.8	18.3
	2028	10.5	7.8	18.3
	2033	10.5	7.8	18.3
	2038	10.5	7.8	18.3

Discounted at 8-5/8 Percent

1985	10.5	3.8	14.3
1988	10.5	4.0	14.5
2038	10.5	4.8	15.3

LOCATION BENEFITS

There are no open lands in the protected floodplain suitable for consideration of locational advantage and land enhancement, particularly since a high degree of protection is not given by the channel project.

ADVANCED REPLACEMENT BENEFITS

Advanced replacement benefits are considered to occur as a result of the protection plan replacing an existing structure with a new structure, thus extending the period during which existing benefits will be realized.

There are no replacements included for the Channel Modification project; therefore, advanced replacement benefits cannot be credited.

AGRICULTURAL BENEFITS

No agricultural lands are in the protected floodplain. Therefore, agricultural benefits were not included.

REDEVELOPMENT BENEFITS

The analysis for redevelopment benefits is used to evaluate the economic impact that would accrue to the affected area as a result of the increased employment needed to construct the project. Fayette County is not currently eligible as an area having high unemployment or underemployment. Therefore, redevelopment benefits are not credited to the project.

RESIDUAL DAMAGES

Residual damages are those AAD's not prevented by the project. These are shown in this appendix to indicate damage that would be expected to occur even if the project were implemented.

SECTION 6 - NONSTRUCTURAL MEASURES

TYPES USED

Nonstructural measures do not attempt to reduce or eliminate flooding, but are intended to affect the use and development of the floodplain to lessen the damaging effects of floods. Nonstructural flood reduction measures considered for this report include: (1) relocation and/or evacuation of homes and businesses, and (2) floodproofing measures for homes and businesses.

RELOCATION AND EVACUATION

Relocation and/or evacuation were discussed in the Initial Appraisal. However, at that time, there was less information regarding business and residential establishments available than at present. Since the time of the initial study, floor elevations and physical characteristics have been obtained through field surveys and interviews. Table B-11 lists the numbers of each type of structure existing with first floors below the 30-year flood level.

TABLE B-11

Nonstructural Information

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Number of Businesses with Floors Lower Than the 30-Year Flood	0	0	5	20	0	0	0	0
Average Number of Feet Below the 30-Year Flood	0.0	0.0	0.7	1.5	0.0	0.0	0.0	0.0
Number of Homes with Floors Lower Than the 30-Year Flood	0	0	2	1	4	6	0	0
Average Number of Feet Below the 30-Year Flood	0.0	0.0	0.5	0.5	1.2	1.0	0.0	0.0
Average Value of Homes (\$1,000)	0.0	0.0	27.0	60.0	56.0	32.0	0.0	0.0
Number of Public Buildings with Floors Lower Than the 30-Year Flood	0	0	2	0	0	0	0	1

All business buildings are of heavy construction (brick, concrete block, steel, etc.). Clearly, evacuation or relocation costs would greatly exceed the average annual damage removed from the floodplain. This is true of public buildings that are likewise constructed of heavy construction materials.

Reaches 3, 4, 5, and 6 appear to have the greatest potential for nonstructural solutions because of the low level of first floors. The lowest house exists in reach 6 with floor elevation at the 8-year flood level. Floor levels of the other reaches vary upward from the 16-year flood level. Average annual damage of the 13 homes is estimated at a maximum of \$8,200. Annual costs for relocating the homes are estimated to be \$37,700. The B/C ratio is, therefore, 0.2 ($\$8,200 \div \$37,700$), indicating this type of nonstructural solution to be infeasible as a Corps project.

FLOODPROOFING

Methods of floodproofing commercial buildings are (1) raising the building's floor elevations, and (2) furnishing sealed panels across windows and doorways. The first method is clearly too expensive because of the heavy construction of the buildings and the problems with access. The second method is generally unreliable due to limited warning time. In general, peak runoff would occur in approximately 2 hours, with the total flood duration approximately 5 hours. With 25 businesses involved, it is unlikely that materials could be located and assembled soon enough to be effective.

Acceptable methods of floodproofing homes involve raising the elevation of first floors and filling or floodproofing basements. Estimate of possible benefits of raising the 13 houses amounts to \$2,800. Annual cost of raising these homes amounts to \$27,200. The B/C ratio is 0.1 (\$2,800 ÷ \$27,200).

SECTION 7 - NET BENEFIT COMPUTATIONS

CONSTRUCTION COSTS

Construction costs based upon 1986 prices were estimated for the Channel Modification plan. Costs were based upon excavating and shaping the channel, all of which involved the work of locating, transporting, and placing construction materials. Items included in cost estimates are illustrated by the estimate summaries given by table B-12.

TABLE B-12

Cost Estimates for Channel Modification (\$)

<u>Description</u>	<u>Federal Cost</u>	<u>Non-Federal Cost</u>
First Cost	132,300	
Lands and Damages		118,000
Totals	132,300	118,000
Total Cost	250,300	

INTEREST DURING CONSTRUCTION

The method of computing interest during construction is shown in table B-13.

TABLE B-13

Interest During Construction Interest Rate at 8-5/8%

<u>Year</u>	<u>Construction Cost (\$1,000)</u>	<u>Time to Base Year and Payments</u>	<u>Factor For Compound Interest Increase at 4-5/16% Per Payment</u>	<u>Accumulated Interest to Base Year (\$1,000)</u>
1988	250.3	0.5 (1)	.04321	10.8

Annual cost is computed using the interest rate, the period of analysis, and annual operation and maintenance costs. The computation is shown by table B-14.

TABLE B-14

<u>Annual Costs - Channel Modification</u>		
<u>Interest Rate at 8-5/8%</u>		
<u>Item</u>	<u>Amount</u> <u>(\$1,000)</u>	<u>Amount</u> <u>(\$1,000)</u>
Construction Cost	250.3	
Interest During Construction	<u>10.8</u>	
Total First Cost	261.1	
Interest and Amortization (.08765)		22.9
Annual Operation and Maintenance		<u>1.6</u>
Total Annual Cost		24.5

SECTION 8 - SENSITIVITY ANALYSIS

INTEREST RATES

Changes in interest rates that may occur in the future would affect future benefits and annual costs with corresponding changes in B/C ratios. Computations using two interest rates were made to indicate the change of B/C ratios with change in interest rate. Comparisons of results are displayed in table B-15 for project results that include redevelopment benefits, and for project results that omit redevelopment benefits. Redevelopment benefits are only used to the extent they do not exceed the local cost. Therefore, they are a legitimate benefit.

TABLE B-15

Benefits Versus Costs
Summarized for Two Interest Rates

	8-5/8%	B/C	8-7/8%	B/C
	Benefits	Ratio	Benefits	Ratio
	(\$1,000)		(\$1,000)	
CHANNEL MODIFICATION				
Benefits				
Existing	33.4	1.4	33.4	1.3
Base Year	34.2	1.4	34.2	1.4
Emergency Added	36.7	1.5	36.7	1.5
Flood Insurance Added	37.5	1.5	37.5	1.5
Future Growth Added	38.3	1.6	38.5	1.5
Annual Costs	24.5		25.1	
Net Benefits	17.7		13.4	
Internal Rate of Return (% interest where B/C=1)	10.1			

RISK AND UNCERTAINTY

Risk factors are sensitive to the type and quality of protection. Structural risk relates to what could happen if the project fails. The failure of the channel project would not be a sudden failure of the type that would be experienced for a levee or reservoir project. Sudden bank erosion could occur which could produce minor changes in channel alignment or cause trees or structures to fall into the channel and block its flow. Sedimentation during low flows is a constant problem that would need to be monitored. Sedimentation gradually reduces the channel's carrying capacity.

PUBLIC ACCEPTANCE

Project success is sensitive to public acceptance. The channel modification project would affect occupants of the SPF floodplain in various degrees. Minor inconveniences arising from the reductions in usable land for existing homes would occur. There would be noise, dust, blocked traffic, and other minor inconveniences such as those occurring when utility lines are disrupted during construction. These impacts, however, would be temporary.

For the selected plan, the proposed channels are too small in cross section to have well defined levels of flood protection or levels where all waters of a certain level of flooding are contained within the banks of a project.

Although it is possible that the project would be acceptable in the short term, the perceptions of the damage reduction in the long term may result in negative attitudes. Table B-16 shows the damage and water surface reductions expected from the project. Although there are significant economic benefits, the residual damage is very high and the water surface is reduced generally less than 1 foot. This reduction will probably not be perceived by the majority of property owners as being significant.

Table B-16 indicates the project to be lacking in damage prevention for higher level floods. According to the table, channel modification reduces damage 45.9 percent for the low level flood (the 1984 flood, a 25-year flood) and 12.8 percent for the high level flood (the 1979 flood, a 56-year flood).

The project provides unequal distribution of damage reduction to each reach. The project will not change the channel for Reach 1 because of lack of benefits. During the 1979 and 1984 floods, Reach 6 would have received the greatest reduction in flood heights from the project. Other reaches would receive less reduction in descending order as follows: Reaches 3, 5, 2, 4, and 8. Reaches 4, 7, and 8 would have received less than one-half foot reduction in flood heights.

Only 6 businesses and 7 homes have first floor levels lower than a 25-year flood; they are, therefore, the greatest recipients of project benefits out of a total of 42 businesses, 94 homes, and 8 public facilities located in the floodplain.

SECTION 9 - SOCIAL IMPACT ASSESSMENT

INTRODUCTION

The following social analysis examines the impact of modifying the channel of Dry Run Creek to reduce flood damages in Oelwein, Iowa.

AFFECTED PROPERTY

The city of Oelwein is a small, rural community located in Fayette County in north-central Iowa. The development of Oelwein is primarily residential, with some commercial and industrial activity. The 1985 population was approximately 7,400. As shown in table B-17, the entire area has registered a slight loss in population since 1980; however, this trend is expected to reverse during the next 5 years.

TABLE B-16
Project Effects Upon Flooding
Channel Modification

REACH	(yr)	(yr)	(yr)	(MCVD)	(MCVD)	(ft)	\$1,000	\$1,000	(%)	(MCVD)	(MCVD)	(ft)	\$1,000	\$1,000	(%)
1	50	50													
2	42	55	25	1039.0	1038.4	0.6	26.0	0.0	0.0	69.2	1036.9	0.5	26.0	0.0	0.0
3	10	12	10	42.1	41.8	0.3	253.0	8.0	18.0	19.0	41.2	40.3	96.0	0.0	26.0
4	14	20	14	46.0	46.0	0.0	295.0	205.0	48.0	0.0	45.0	44.6	96.0	51.0	45.0
5	2	2.4	2	48.2	48.0	0.2	26.0	25.0	0.0	0.0	45.0	44.6	96.0	49.0	49.0
6	2	3.6	2	51.7	51.1	0.6	126.0	101.0	1.0	3.8	47.4	46.8	20.0	15.0	25.0
7	2	2.3	2	52.8	52.6	0.2	26.0	25.0	1.0	19.8	51.2	50.2	140.0	70.0	50.0
8	1	1.0	1	55.2	55.1	0.1	4.0	3.7	0.3	3.8	52.2	51.9	19.0	16.0	3.0
TOTALS							762.0	664.7	97.3	12.8			373.0	201.9	171.1
															45.9

COMMUNITY GROWTH

Based on the small scale of the project, few employees would be required. The surrounding area would not be affected since the local population provides a labor pool of sufficient size to absorb project needs.

COMMUNITY COHESION

The project consists of cleaning and widening the existing channel, thereby minimizing the disturbance to existing neighborhoods. The residents of Oelwein have expressed negative feelings about relocation of any kind. United with their common feelings regarding relocations, residents would likely feel stronger community ties since no relocations would result from the project. The project also would be expected to improve community cohesion by reducing the incidence of floodwaters acting as a barrier separating the northern portion of the city from the southern portion. This would decrease interrupted interaction between the various parts of the city.

TABLE R-17

Population Trends for the Affected Area 1/ 2/

Area	POPULATION					Percent Change 1980 - 1985	Percent Change 1985 - 1990
	1970	1980	1985	1990	2000		
City of Oelwein, IA	7,735	7,564	7,402	7,517	N/A	-2.1	1.6
Fayette County, IA	26,898	25,488	24,700	24,200	23,900	-3.1	-2.0
State of Iowa	2,825,041	2,913,808	2,905,400	2,913,500	2,965,000	-0.3	0.3

1/ Iowa Development Commission, 1985 Statistical Profile of Iowa, 1985.2/ Claritas Corporation, RESIDE, 1980 & 1985, The National Encyclopedia of Residential ZIP Code Demography.
PROPERTY VALUES

PROPERTY VALUES

The project would reduce the incidence of flooding in the city of Oelwein and would therefore result in slightly improved services to and from the affected areas. A minimal increase in property values would be expected due to the reduction of flood damages in these areas.

REGIONAL GROWTH

No effects on regional growth would be expected due to the project's limited area of influence.

TAX REVENUES

A slight increase in tax revenues would be expected as a result of the anticipated rise in property values. This increase might offset some of the tax losses due to removing approximately 5.5 acres of project alignment real estate from the tax roles.

PUBLIC FACILITIES AND SERVICES

Services to and from the affected areas would improve slightly as a result of the reduced incidence of flooding with the project. Benefits resulting from the project are difficult to quantify, but would be present in a small degree. For example, during times of flooding, ambulances must drive at reduced speeds when using flooded roads or use roads which skirt flooded areas, thereby slowing response time. Some of this effect would be reduced. The project would slightly decrease erosion damages to seven bridges, and would decrease interrupted access to four churches and two public parks.

DISPLACEMENT OF PEOPLE

No relocations would be required for the project.

EMPLOYMENT VERSUS LABOR FORCE

The project would not affect the permanent employment or labor force of the three-county area. However, the project would temporarily increase area employment during the construction phase.

BUSINESS AND INDUSTRIAL ACTIVITIES

Changes in business and industrial activity would be minimal. The increase in business activity occurring from the temporary infusion of construction workers would be absorbed into the area without long-term effect. The influence of floodwaters acting as a barrier separating residential areas from the central business district would decrease interrupted interaction between these businesses and their customers. No business relocations would be required for the project.

FARM DISPLACEMENT

No farms would be affected by the project.

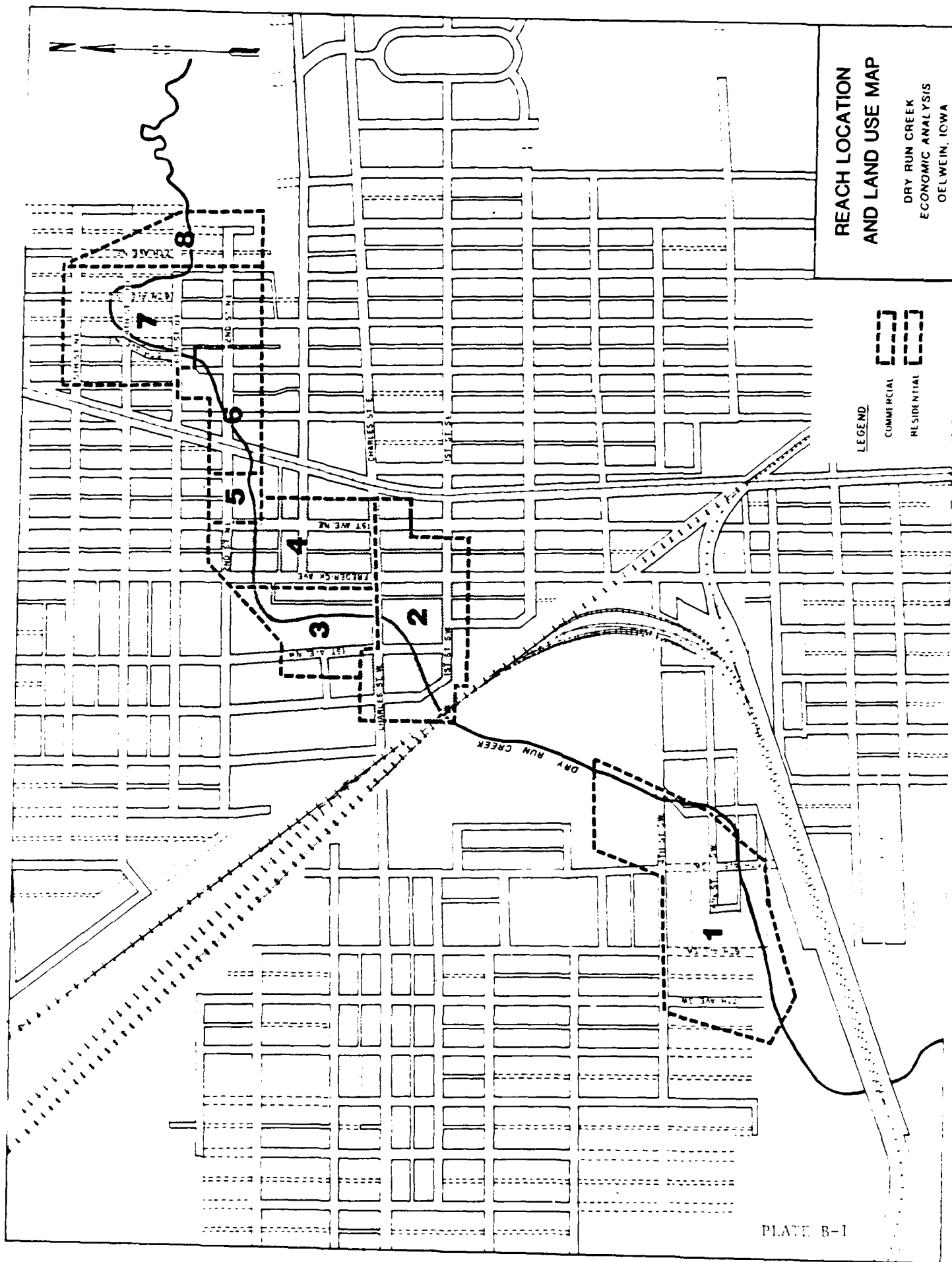
LOSS OF LIFE

Loss of life is a definite possibility for a small stream such as Dry Run Creek. Due to flash flooding, building occupants have little warning, especially at night, to allow them to leave the floodplain soon enough to avoid disaster. This is especially true of higher level floods (e.g., those higher than those experienced to date). The project would reduce the incidence of flood occurrence for those floods large enough to produce a loss of life. Therefore, the project will have some effect in reducing the hazard.

REACH LOCATION AND LAND USE MAP

DRY RUN CREEK
ECONOMIC ANALYSIS
OELWEIN, IOWA

LEGEND
COMMERCIAL
RESIDENTIAL



GEOTECHNICAL ANALYSIS

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DETAILED PROJECT REPORT
FOR
SECTION 205
FLOOD CONTROL PROJECT

DRY RUN CREEK
PAYETTE COUNTY
OELWEIN, IOWA

APPENDIX C
GEOTECHNICAL ANALYSIS

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Physiography	C-2
Soils	C-2
Bedrock	C-2
Foundation of Channel	C-2
Slope Stability	C-3

List of Plates

<u>No.</u>	<u>Title</u>
C-1	Boring Locations
C-2	Boring Profiles
C-3	Slope Stability

DETAILED PROJECT REPORT
FOR
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FLOOD CONTROL PROJECT

DRY RUN CREEK
FAYETTE COUNTY
OELWEIN, IOWA

APPENDIX C
GEOTECHNICAL ANALYSIS

PURPOSE AND SCOPE

This appendix defines general geology and foundation conditions for the proposed project. The scope of study is to cite and analyze geotechnical considerations pertinent to the implementation of the project.

PROJECT LOCATION AND GENERAL DESCRIPTION

The proposed project is a channel modification of Dry Run Creek through Oelwein, Iowa. The purpose of the channel modification is to expand the channel capacity to that of the existing bridge openings spanning the channel. Oelwein, which is in Fayette County, is approximately 37 miles northeast of Waterloo, Iowa. The proposed channel modification involves clearing the existing Dry Run Creek channel bed of debris, widening the channel bottom to a 20-foot width, and reshaping the channel sides to a 1V and 2H slope. No additional cutting of the channel bottom is involved.

SUBSURFACE INVESTIGATIONS

Soil boring data were obtained from the Iowa Department of Transportation (IDOT). Seven of the IDOT borings were taken in Oelwein along Dry Run Creek at the Frederick Avenue and First Avenue crossings. Locations and logs of these borings are shown on plates C-1 and C-2, respectively. This information, coupled with the USDA Soil Conservation Soil Survey for Fayette County was sufficient to determine the necessary soil and foundation parameters for the proposed channel modification. No additional borings were deemed necessary at this stage.

GEOLOGY AND SOILS

PHYSIOGRAPHY

Dry Run Creek is a small, intermittent tributary to Otter Creek, a tributary to the Wapsipinicon River. In the area of this study, Dry Run Creek flows across a broad, sandy terrace. This location is near the north-eastern margin of the Iowan Surface, which is characterized by a thin layer of loess pre-Illinoian glacial till on bedrock.

SOILS

The Soil Survey for Fayette County indicates that for most of the length of the project, Dry Run Creek flows on a sandy soil called the Saude. The upper 5 to 10 feet consists of a mixture of alluvial silts and clays with sand. The parent material below the top 5 to 10 feet is a coarse, well to moderately sorted gravelly sand (SW, SM in Unified Soil Classification). This is confirmed by borings from the IDOT which show a stiff, sandy, silty clay overlying medium to coarse sand with boulders.

BEDROCK

Depth to bedrock in the region is highly irregular, being exposed at the surface along Otter Creek and found at 20- to 30-foot depths along Dry Run Creek, according to the IDOT borings. Bedrock consists of limestone of the Wapsipinicon Formation, middle Devonian in age. It can be karstic, with solutioned joints and crevices. Eroded surfaces make for highly variable depths to bedrock.

FOUNDATION OF CHANNEL

The available soil boring data indicate that along the creek alignment the top 5 to 15 feet is a layer of stiff, sandy, silty clay fill-like material. Underlying this is a thick stratum of medium sand with occasional boulders. Within this stratum, borings show evidence of lenses of soft clay. Poor quality broken limestone lying on medium-hard limestone is found beneath the sand stratum. The depth of limestone varies from 10 to 20 feet below the existing channel bottom. This indicates that rock should not be encountered during channel clearing operations. Ground water levels are indicated to be at or just below the channel invert. Due to the intermittent nature of the Dry Run Creek flow, ground water should pose no problem during construction.

SLOPE STABILITY

A slope stability analysis was run for the most critical section of this project. The slope stability analysis program "UTEXAS2," which utilizes Spencer's procedure, was used to determine the most critical set of soil parameters. The final analysis was then performed using the Modified Swedish Method for a circular arc slope stability analysis in accordance with EM 1110-2-1902, "Engineering Design Stability of Earth and Rockfill Dams," dated 1 April 1970.

The critical section topographically is located near Station 26+85 at the abandoned railroad embankment (see plate 6 of main report). The embankment is 15 feet high with a 1V and 2.5H side slope. A range of conservative shear strengths (Q) and a range of unit weights were assumed for the critical configuration of embankment and foundation to estimate the stability of the embankment after construction. The range of soil parameter values was selected based on the available soil data discussed above. A thorough study was made to locate the most critical arc failure surface for various embankment and foundation shear strengths. The critical soil parameter values and trial shear surfaces are shown on plate C-3. The computed safety factor of 2.7 meets the requirements of EM 1110-2-1902. Therefore, no slope stability problems should be encountered.

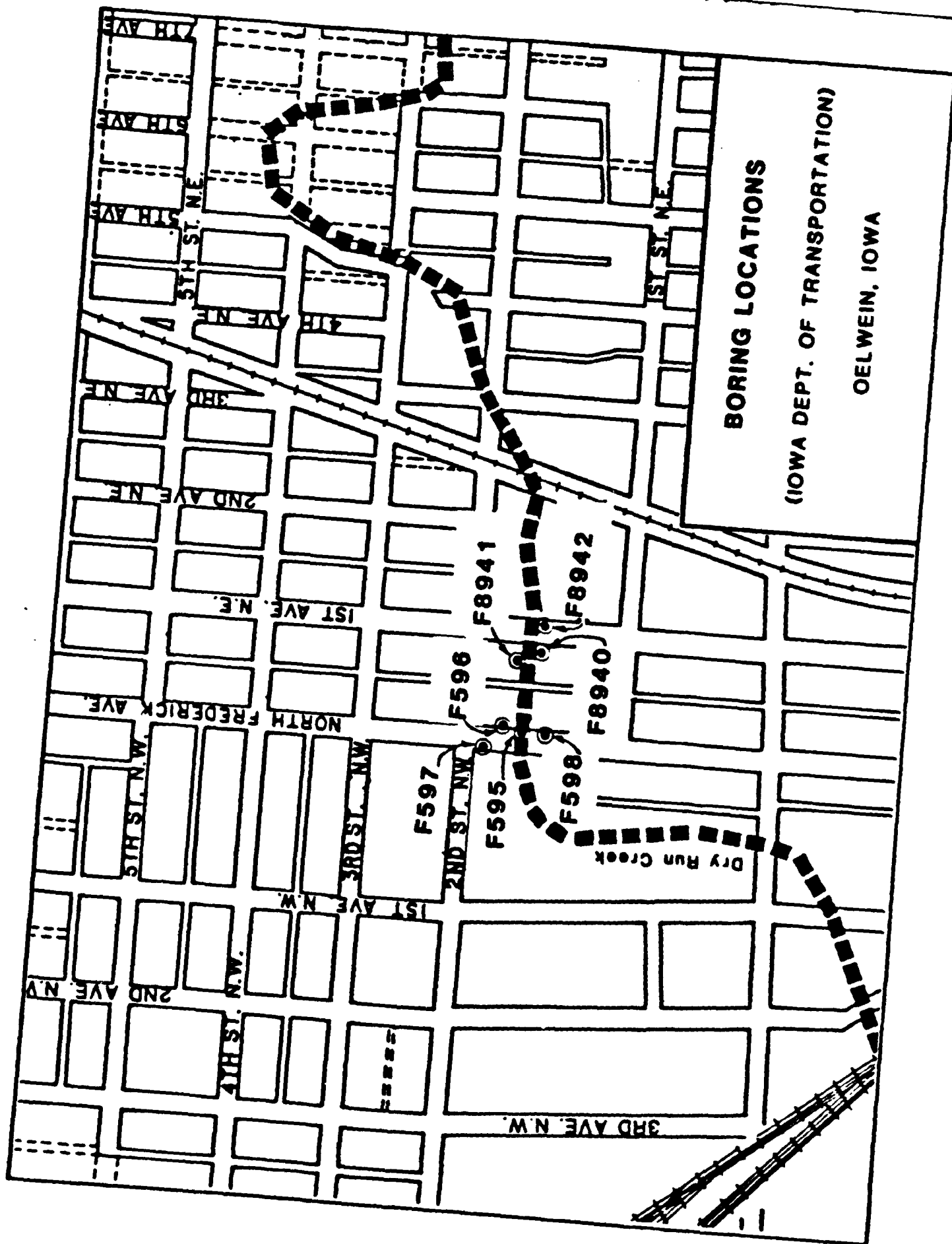


PLATE C-1

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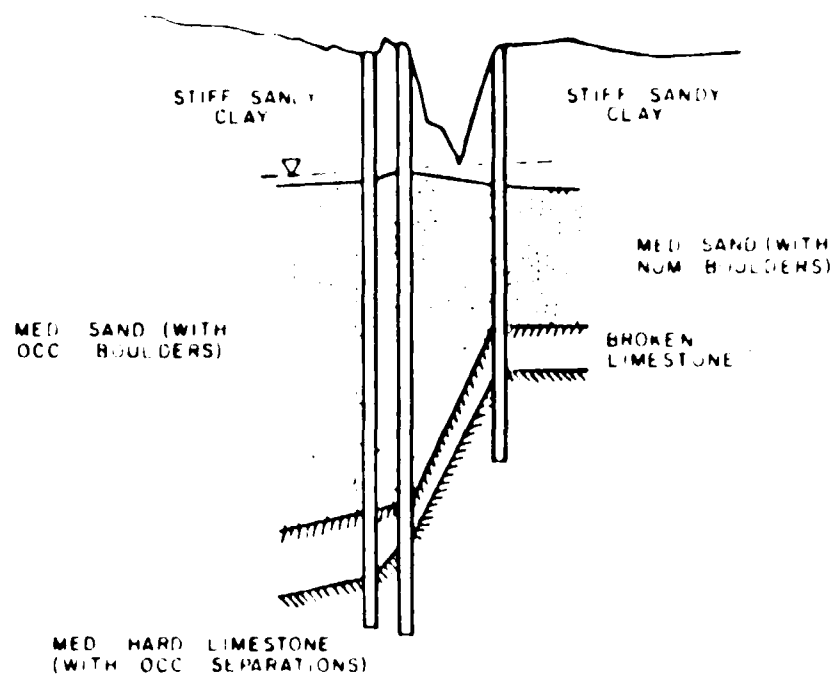
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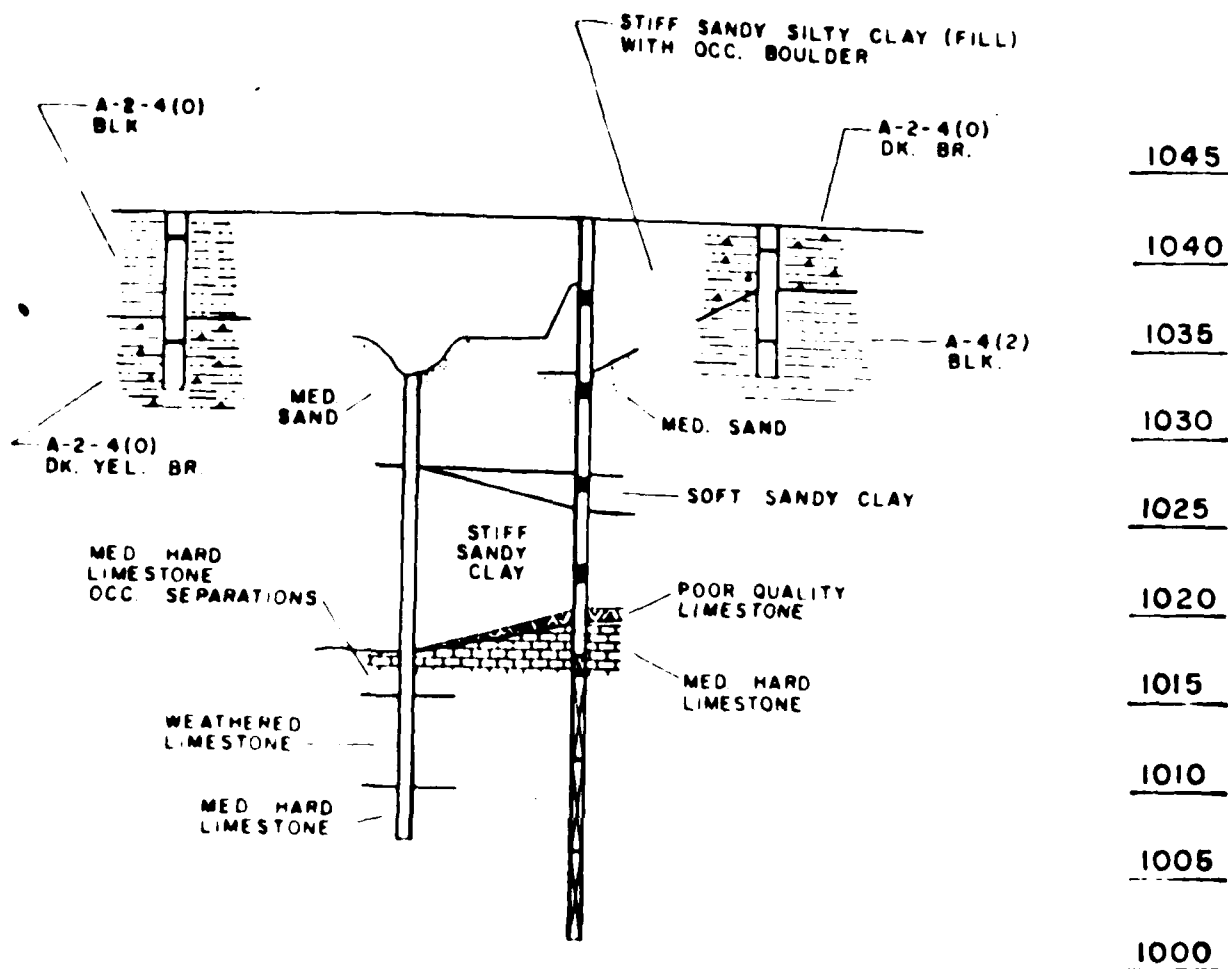


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1ST AVENUE N.E.



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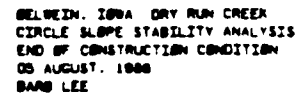
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NORTH FREDERICK AVENUE

BORING PROFILES

(IOWA DEPT. OF TRANSPORTATION)

OELWEIN, IOWA



PERTINENT CORRESPONDENCE

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DETAILED PROJECT REPORT
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DRY RUN CREEK
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OELWEIN, IOWA

APPENDIX D
PERTINENT CORRESPONDENCE

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City of Oelwein

BEN D. LEVIN
MAYOR

Oelwein, Iowa 50562

October 29, 1981

Colonel Bernard P. Slofer
Commander and District Engineer
U.S. Army Engineer District, Rock
Island Clock Tower Building
Rock Island, Illinois 61201

Dear Colonel Slofer:

This letter is to seek the assistance of the U.S. Army Corps
of Engineers under Section 205 of the 1948 Flood Control
Act, in providing protection to Oelwein, Iowa.

Your consideration of this request would be greatly appreciated.

In the event that you need additional information, please
contact John S. Beckman, City Administrator.

Sincerely,



Ben D. Levin
Mayor of Oelwein

BDL/sp

City of Oelwein

BETH McFARLANE
MAYOR

Oelwein, Iowa 50662

May 7, 1985

Colonel William C. Burns
District Engineer
U. S. Army Engineer District, Rock Island
Clock Tower Building
Rock Island, Illinois 61204-2004

Dear Mr. Burns:

This is to assure that the City of Oelwein, Iowa, agrees to act as the local sponsoring agency for the proposed flood control project in Oelwein. This project is to be performed under authority of Section 205 of the 1948 Flood Control Act, as amended. The requirements of local cooperation have been presented to the City Council of Oelwein. I have been authorized to notify you that the City of Oelwein is ready, willing and legally and financially able to:

- (a). Provide without cost to the United States, all real estate interests necessary for the project.
- (b). Hold and save the United States free from all damages due to the construction, operation and maintenance of the project except where such damages are due to the fault or negligence of the United States or its contractors.
- (c). Maintain and operate the project, or integral parts thereof, in accordance with regulations prescribed by the Secretary of the Army.
- (d). Accomplish all relocations and alterations of buildings, utilities (except the parts of utilities that pass over, through, or under the protective works), and other existing structures that are necessary for project construction (except railroad bridges, ramps and approaches thereto).
- (e). Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved 21 January 1971, in acquiring lands, easements, and rights-of-ways for construction and subsequent maintenance of the project, and inform affected persons of pertinent benefits, policies, and procedures in connection with said act.
- (f). Comply with Section 601 of Title VI of the Civil Rights Act

of 1964 (Public Law 88-352), and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300, Title 32, Code of Federal Regulations in connection with the construction, operation, and maintenance of the project.

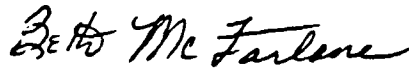
- (9). Contribute all project costs in excess of the Federal statutory limitation of \$4,000,000.

The local cooperation agreement will also require the sponsor to grant the Government a right to enter upon, at reasonable times and in a reasonable manner, lands which the city owns or controls, for access to the project for purpose of inspection and for purpose of completing, repairing, and maintaining the project if such inspection shows that the city for any reason is failing to complete, repair, and maintain the project in accordance with its assurances, and has persisted in such failure after a reasonable notice in writing by the Government delivered to the Mayor of Oelwein. No repair and maintenance by the Government in such event shall operate to relieve the city of responsibility to meet its obligations as set forth above, or to preclude the Government from pursuing any other remedy at law or equity.

It is understood that this is a letter of intent only, that it does not commit the City to the project, and that the City will be asked to enter into a formal agreement to provide the above local cooperation requirements only after the final plans for the project have been approved by both the City and the Corps of Engineers.

This statement of our position is submitted with the understanding that the \$141,000 Federal cost estimate and the \$232,000 non-Federal cost estimate are subject to refinement as a result of your further planning. We further understand that, at the time a formal local cooperation agreement is requested of the City, we will be furnished a firm cost estimate for our review and consent prior to initiation of construction on the proposed project.

Sincerely,



Beth McFarlane
Mayor

BM/wj



United States
Department of
Agriculture

Soil
Conservation
Service

210 Walnut Street
693 Federal Building
Des Moines, Iowa 50309

September 25, 1985

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

Dear Sir:

This office has reviewed your Reconnaissance Study for flood damage reduction along Dry Run Creek in Oelwein, Iowa. This study was conducted under Section 205 of the 1948 Flood Control Act. The projected effects of the proposed channel clearing, minor bottom widening, and side slope shaping appear to be reasonable. As pointed out by your report the greatest damage reduction impact would be for frequently occurring floods with little effect expected for a 100-year event.

We appreciate the use made of the Soil Conservation Service "Flood Study Report, Dry Run, Oelwein, Iowa," March 1982. The viewpoint of this office is that one of the alternatives suggested in that report has particular merit. The watershed upstream of East Line Road appears to be especially well suited to tile outlet terraces. Topography is mildly sloping which contributes to economical earthwork. Tile outlet terraces perform on small drainage areas such as this much the same as floodwater retarding structures. Increasing our 10-year runoff standard capacity for storage volume to 50-year runoff, or more, is feasible for that watershed. Terraces normally exhaust the detention storage in 48 hours which should be satisfactory for this size watershed. Considering the potential for controlling runoff from a significant part (40 to 50 percent) of the Dry Run Watershed by detention we think this is preferable as a first alternative. Other benefits to water management and erosion control would accrue to the terraced fields.

Thank you for this opportunity to review your reconnaissance report. We recognize the severity of flood problems along Dry Run and hope the city will implement a plan to reduce the probability of damage in its flood plains.

Sincerely,

J. Michael Nethery
State Conservationist

COMMISSIONERS
BAXTER FREESE, Chairman - Weppan
RICHARD THORNTON, Vice-Chairman - Des Moines
JOHN D. FELD - Harburg
SAM KENNEDY, III - Cedar Lake
MARLAN PIKE - Whiting
WILLIAM B. RIDOUT - Estherville
THOMAS E. SPAN - Dubuque



Larry J. Wilson — Director
Wallace State Office Building, Des Moines, Iowa 50319-0034
515/281-5145

An EQUAL OPPORTUNITY Agency

July 10, 1986

Wayne Fischer
Fish and Wildlife Service
Rock Island Field Office
1830 Second Avenue, Second Floor
Rock Island, IL 61201

Re: Dry Run Creek

Dear Mr. Fischer:

The following comments are in review of the reconnaissance report on Dry Run Creek and a field inspection. Comments pertain to channel widening and clearing proposals of that portion of Dry Run Creek from Eighth Avenue NE to the Chicago and Northwestern Railroad culvert.

A June field inspection indicated Dry Run Creek is limited in its ability to support fish. It appeared much of the creek would dry up during dry periods of the year leaving few pool areas conducive for fish survival. Only two sunfish were observed during the inspection.

The riparian habitat bordering the creek is very beneficial to urban wildlife. Much of this fringe would be destroyed through channel clearing and widening activities.

This agency's mitigation recommendations would be to establish a grass border along the stream with specific shrub and tree plantings that benefit urban wildlife. This mitigation plan will be provided by Laura Jackson, Urban Biologist for the Iowa Division of Fish and Wildlife.

Sincerely,

Martin Konrad
Program Planner

MK:ss1/CCW191S02.01



department of water, air and waste management

RECORD COPY

File Name CON 11-7 Environmental Assessment
Senders Initials DW

July 18, 1986

Colonel William C. Burns
District Engineer
US Army Engineer District, Rock Island
Attn: Planning Division
Clock Tower Building - PO Box 2004
Rock Island, IL 61201

RE: Reconnaissance Report for Section 205
Flood Control Project, Dry Run Creek
Oelwein, Iowa

Dear Col. Burns:

The above-referenced reconnaissance report, dated August 1985 has been reviewed. General and specific comments follow.

Related Studies and Reports (see page 3)

A preliminary draft Flood Insurance Study (FIS) has been prepared for Oelwein (Feb. '86, DeWild, Grant, Reckert and Assoc.) and forwarded to the Federal Emergency Management Agency for review, comment and finalization. The FEMA draft should be available soon. A cursory examination of the preliminary draft FIS versus the reconnaissance report did not indicate any substantial differences in hydrology and hydraulics, but the FEMA draft should be reviewed closely prior to preparing the Detailed Project Report to resolve any significant inconsistencies or conflicts. The FIS will be the technical document used to regulate future flood plain construction and identify flood hazard properties for flood insurance purposes.

Flood Plain Management Regulations/Flood Insurance

The non-structural alternatives discussed in the reconnaissance report did not mention flood plain management regulations or the availability of flood insurance. Had some of the newer buildings been elevated or flood proofed in accordance with state requirements, damages during the 1979 and 1984 floods would undoubtedly have been reduced. In addition, the availability of flood insurance will allow property owners to protect themselves financially.

Oelwein is currently participating in the National Flood Insurance Program and in the near future will be asked to adopt comprehensive flood plain management standards which meet minimum FEMA and state standards. Over the long term, adoption and enforcement of those standards would tend to reduce annual average damages in terms of constant dollars.

FPPW198F05.01

D-6

Colonel William C. Burns
U.S. Army Engineer District, Rock Island
Page 2

Flood Plain Development Permit

As the local sponsor, the City of Delwein must obtain a Flood Plain Development Permit from the Flood Plain Section of the Iowa Department of Natural Resources. Application should be made on the current Joint Application Form (WAWM Form 36) and include engineering plans of the proposed project. A detailed staff review would be conducted prior to issuance of a permit, including an assessment of any impacts on fish and wildlife habitat, public rights, etc.

Section 401 Certification

The transmittal letter requested Section 401 water quality certification. Inasmuch as the Environmental Assessment or Environmental Impact Statement has not been completed and the project design not finalized, Section 401 water quality certification or waiver will not be granted until our staff has the opportunity to review those documents.

In general, our staff review of the reconnaissance report did not reveal any major concerns that would tend to stop or redirect the Section 205 project at this point. Thank you for the opportunity to comment and if you should have any questions, feel free to contact Jack Riessen (flood plain permit) or Keith Bridson (Sec. 401 certification).

Sincerely,

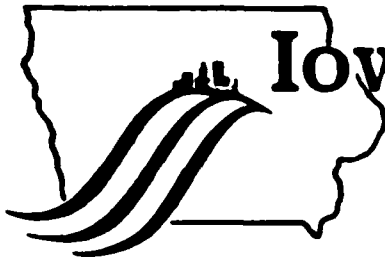
ENVIRONMENTAL PROTECTION DIVISION


for Darrell McAllister, Chief

Surface and Groundwater Protection Bureau

DM:JR:m1a/FPPW198F05.01

cc: Tom Wallace, Dept. of Economic Development, LOCAL
Al Schulz, Region VII FEMA, Kansas City, Missouri



Iowa

State Historical Department

East 12th and Grand Avenue, Des Moines, Iowa 50319
(515) 281-5111

SEP 30 1986

Dudley M. Hanson, P.E.
Chief, Planning Division
Rock Island District Corps of Engineers
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

RE: FLOOD CONTROL PROJECT - DRY RUN CREEK
OELWEIN, IOWA - FAYETTE COUNTY

Dear Mr. Hanson:

Based on the information you provided, we find the proposed project to have no effect upon known historic or other cultural resources. Therefore, we recommend project approval.

However, if the proposed project work uncovers an item or items which might be of archeological, historic or architectural interest, or if important new archeological, historic or architectural data come to light in the project area, the work should be delayed for sufficient time to notify this office in order that the significance of the discovery can be determined.

Should you have any questions or if we can be of further assistance to you, please contact Dr. Kay Simpson, Archeological Surveys, at 515-281-8744.

Sincerely,

Dr. Carol L. Ulch
Deputy State Historic Preservation Officer

/mdd



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P O BOX 2004
ROCK ISLAND ILLINOIS 61204 2004

October 1, 1986

Planning Division

Mr. Larry Wilson
Director
Iowa Department of Natural Resources
Wallace State Office Building
900 East Grand Avenue
Des Moines, Iowa 50319

Dear Mr. Wilson:

This is in reference to the proposed Section 205 flood control project at Oelwein, Iowa. Details of this project, including proposed actions and affected areas, were provided to your office by the Rock Island District and the U.S. Fish and Wildlife Service to assist you in developing comments and recommendations. Review of a Flood Insurance Study (FIS) recently prepared for Dry Run and Otter Creeks in Oelwein shows that the proposed disposal site identified in earlier correspondence lies within the flood hazard area of Otter Creek as delineated on the FIS map. For this reason, the disposal site identified in earlier coordination letters is no longer being considered as an alternative.

District staff traveled to Oelwein on September 9, 1986, to investigate three potential disposal sites identified by the city. A minimum of 1 acre of land would be required to dispose of approximately 5,000 cubic yards of material to a height of 4 feet (more land would be required if fill depth were limited). Site 1 is located north and west of the Iowa Ham Building at Third Street and Ninth Avenue Northwest. Site 2 is at Red Gate Park, located south of West Charles Street and adjacent to Otter Creek. Site 3 is located directly south of the water tower at Second Street and 13th Avenue Southwest (see enclosed map).

On-site inspection and examination of FIS flood hazard boundary maps revealed that Sites 2 and 3 did not contain adequate surface area outside of flood hazard areas to accommodate the anticipated volume of spoil material. The remaining site, Site 1, is a tract of vacant land, approximately 8 to 10 acres in size,

which is zoned for agricultural use but is presently uncultivated. The site lies outside of the Dry Run Creek and Otter Creek flood hazard boundaries. Vegetation consists of adventitious forbs, woody shrubs, and scattered trees typical of old field secondary successional growth. Use of this site for disposal would result in a loss of some food and cover for small mammals and songbirds in the area; however, it is anticipated that vegetation would be reestablished in a relatively short time. No impacts to endangered or threatened species are anticipated and no changes in drainage are expected to occur as a result of disposal in this area.

We request your comments on this action at your earliest convenience. If no reply is received by this office within 30 days from the date of this letter, we will assume that your agency has no comment on the proposed disposal site.

If you have any questions or desire further information, please call Ms. Charlene Carmack at 309/788-6361, Ext. 570, or write to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

Signed By
J. T. SCHNERRE

 Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure



DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

October 3, 1986

Planning Division

Mr. Morris Kay
U.S. Environmental Protection Agency
Region 7
726 Minnesota Avenue
Kansas City, Kansas 66101

Dear Mr. Kay:

This is in reference to the proposed Section 205 flood control project in Oelwein, Iowa. A copy of the Reconnaissance Report for this project was forwarded to your office in August of 1985 for review and comment. The Rock Island District is currently preparing an Environmental Assessment as part of a detailed study of alternatives to alleviate flooding problems along Dry Run Creek in Oelwein.

The preferred alternative would involve channel modification of a 3,500-foot reach of Dry Run Creek from the Chicago and Northwestern Railroad culvert upstream to the bridge at Third Street Northeast. The improved channel would have a 20-foot minimum bottom width with 2:1 minimum side slopes where right-of-way permits (no bridges or other existing structures will be removed or demolished). Approximately 5,000 cubic yards of material will be removed from the channel and side slopes and deposited on a tract of land located north and west of a ham packaging plant at Third Street and Ninth Avenue Northwest. (See attached map for location of project and disposal areas.)

District staff have reviewed existing literature and conducted site inspections of the project area to assess existing conditions and identify potential impacts. Coordination has been initiated with the U.S. Fish and Wildlife Service, the Iowa Department of Natural Resources, the Soil Conservation Service, and the State Historic Preservation Officer to determine the potential for impacts to endangered and threatened animal and plant species, air and water quality, prime and unique farmlands, and important cultural resources.

No Federal or State listed endangered or threatened species are anticipated to be found in the project area due to lack of suitable habitat conditions, disturbance, and the generally urbanized nature of the project area. Impacts to air and water quality due to construction should be minor and short-term. Consultation with the Soil Conservation Service has been initiated to determine if any prime or unique farmland is found within the proposed disposal area. On-site inspection of the project site and proposed borrow areas, together with examination of local historical maps and records, revealed no significant archeological or historic sites which would be affected by the project. A copy of the Detailed Project Report with Environmental Assessment will be provided to your office upon completion.

We request your comments on this action at your earliest convenience. If you have any questions or desire further information, please call Ms. Charlene Carnack at 309/788-6361, Ext. 570, or write to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

Signed By

J. T. SCHNERRE



Dudley M. Hanson, P.E.
Chief, Planning Division

Enclosure



United States Department of the Interior

FISH AND WILDLIFE SERVICE

ROCK ISLAND FIELD OFFICE (ES)

1830 Second Avenue, Second Floor

Rock Island, Illinois 61201

IN REPLY REFER TO:

COM: (309) 793-5800

FTS: 386-5800

October 16, 1986

Colonel Neil A. Smart
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

This responds to your letter of October 1, 1986, regarding the selection of alternate spoil disposal sites for the proposed flood control project at Oelwein, Iowa. Details of the alternate disposal sites were discussed with your staff on October 6 and 7, 1986.

We concur with the elimination of Site 2 and Site 3 as potential spoil disposal sites. As you will recall, we opposed use of the site identified in our Draft Coordination Act Report because of adverse impacts anticipated to bottomland forest along Otter Creek.

Site 1, the preferred disposal site, is described as old field growth. We agree with your assessment of no impacts to endangered or threatened species. While using Site 1 for spoil disposal would result in the loss of some food and cover for small mammals and songbirds, these impacts could be reduced by limiting the disposal to the area adjoining the Iowa Ham parking lot. Further, the spoil should be shaped and planted to grass species beneficial to wildlife. If these or similar conditions are included in the disposition of the spoil, we would have no objection to the use of Site 1 for spoil disposal.

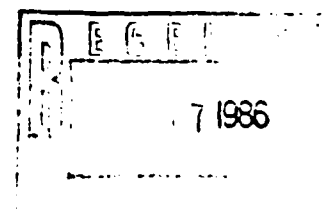
We are pleased to have the opportunity to coordinate with your staff in this matter. If you have any questions or desire clarification of our position, please contact Wayne Fischer of this office.

Sincerely,

Richard C. Nelson
for Richard C. Nelson
Field Supervisor

cc: IA DNR (Konrad)
USEPA (Barber)

D-13





United States
Department of
Agriculture

Soil
Conservation
Service

693 Federal Building
210 Walnut Street
Des Moines, Iowa 50309

January 6, 1987

Colonel Neil A. Smart
District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

Dear Colonel Smart:

We have received and reviewed the Draft Detailed Project Report and Environmental Assessment for Dry Run Creek, Fayette County, Oelwein, Iowa and we have no comments.

Sincerely,

Michael C. Schendel, Acting

J. Michael Nethery
State Conservationist

D-14



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





TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

LARRY J. WILSON, DIRECTOR

January 21, 1987

Colonel Neil A. Smart
District Engineer
U.S. Army Corps of Engineers,
Rock Island District
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, IL 61204-2004

SUBJECT: Draft Detailed Project Report for Section 205 Flood Control Project
Dry Run Creek, Fayette County, Oelwein, Iowa
with Environmental Assessment (November, 1986)
Request for State Section 401 Certification

Dear Colonel Smart:

The above-referenced draft detailed project report (with environmental assessment) has been reviewed by our staff. The Department acknowledges your request for State certification pursuant to Section 401 of the Clean Water Act. State 401 Certification is this Department's evaluation that the project will be consistent with Iowa's Water Quality Standards.

The draft detailed project report with environmental assessment was prepared by the Corps of Engineers and received by DNR in mid-December. The flood control project is on a general stream (Dry Run Creek) discharging into Otter Creek also general at the mouth of Dry Run Creek. Approximately 2 miles below the mouth of Dry Run Creek, Otter Creek is designated as a Class A & B(w) stream.

This letter certifies, subject to these conditions, that the DNR has determined that there is reasonable assurance that the project will be conducted in a manner such that State of Iowa Water Quality Standards are adhered to.

1. This condition is in reference to the proposed excavation material disposal site SW of the railroad tracks. While the site is described as an old farm field with secondary woody species, no mention is made of existing wetland areas in the field or in the downstream proximity. It is important that the placement of dredge or disposal material be in an upland, non-wetland area with stabilization of material to prevent movement into downstream waterways or wetlands. Wetland herein shall correspond to the definition of wetland referenced in Federal Register dated 11/22/82 under Section 33 CFR 323.2 (c).

D-15

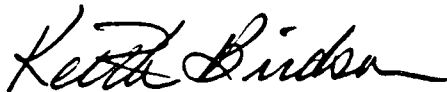
bsg/FPPW016P03.01

Colonel Neil A. Smart
Page 2

2. "Filter and skimmer devices" were briefly mentioned in the environmental assessment as being located in the Oelwein industrial area downstream of the flood control project (reference page 5). The project will alter stream flow and velocity in the Dry Run Creek channel. The project shall not adversely effect the efficiency of the filter and skimmer equipment due to the stream channel alterations planned.

Finally, the Department reminds you that as the local sponsor, the City of Oelwein must obtain a Flood Plain Development Permit from the Flood Plain Section of the Iowa Department of Natural Resources. Application should be made on the current Joint Application Form (WAWM Form 36) and include engineering plans of the proposed project. A detailed staff review would be conducted prior to issuance of a permit, including an assessment of any impacts on fish and wildlife habitat, public rights, etc.

Respectfully,



KEITH BRIDSON, P.E., SUPERVISOR
WATER QUALITY PLANNING SECTION

KB:MA:bkp/FPPW016P03.02

cc: Honorable Beth McFarlane, Mayor, Oelwein, IA
Dave Claman, FPS, EPD
Martin Konrad, F&W Division



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

January 30, 1987

Colonel Neil A. Smart, USA
District Engineer
U.S. Army Engineer District, Rock Island
Attention: Planning Division
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

RE: Draft Detailed Project Report for Section 205
Flood Control Project Dry Run Creek, Fayette
County, Oelwein, Iowa, With Environmental
Assessment

Dear Colonel Smart:

In accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, the Region VII Office of the Environmental Protection Agency (EPA) has reviewed the above referenced document. The EPA concurs with the District's conclusion to issue a Finding of No Significant Impact for the proposed project.

We appreciate the opportunity to review this document. Please keep our office informed if any changes are made to the project or significant issues arise.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Thomas F. Lorenz".

Sr Edward C. Vest
Chief, EIS Section

LOCAL COOPERATION AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE CITY OF DELWEIN, IOWA
FOR A FLOOD CONTROL PROJECT
ON DRY RUN CREEK
AT DELWEIN, IOWA

THIS AGREEMENT, entered into this _____ day of _____,
198____, by and between the DEPARTMENT OF THE ARMY (hereinafter
referred to as the "Government"), acting by and through the Assistant
Secretary of the Army (Civil Works), and the CITY OF DELWEIN, IOWA
(hereinafter referred to as the "Local Sponsor"),

WITNESSETH, that

WHEREAS, construction of a flood control project along Dry Run
Creek at Delwein, Iowa (hereinafter called the "project") was approved
by the Office, Chief of Engineers on _____ in accordance
with the provisions of a report entitled "Detailed Project Report for
Section 205 Flood Control Project, Dry Run Creek, Fayette County,
Delwein, Iowa" dated March 1987, under the provisions of Section 205 of
the 1948 Flood Control Act, as amended (Public Law 858, 80th Congress);
and

WHEREAS, the Water Resources Development Act of 1986, Public Law
99-662, specified the cost-sharing requirements applicable to the
Project; and

WHEREAS, Section 205 of the 1948 Flood Control Act, as amended,
limits the expenditure of Federal funds to an amount not to exceed
\$5,000,000 for any single project; and

WHEREAS, the Local Sponsor has the authority and capability to
furnish the cooperation hereinafter set forth and is willing to

participate in project cost-sharing and financing in accordance with the terms of this Agreement;

NOW THEREFORE, the parties agree as follows:

ARTICLE 1 - DEFINITIONS

For purposes of this Agreement:

(1) The term "project" shall mean construction of approximately 3,500 lineal feet of channel improvements.

(2) The term "total project costs" shall mean all costs incurred by the Local Sponsor and the Government directly related to construction of the project. Such costs shall include, but not necessarily be limited to, actual construction costs, costs of applicable engineering and design, continuing planning and engineering costs incurred after October 1, 1985, supervision and administration costs, costs of project construction contract dispute settlements or awards, and the value of lands, easements, rights-of-way, relocations, and dredged material disposal areas provided for the project by the Local Sponsor, but shall not include any costs for betterments or operation and maintenance.

(3) The term "period of construction" shall mean the time from the advertisement of the construction contract to the time of acceptance of the project by the Contracting Officer.

(4) The term "Contracting Officer" shall mean the Commander of the U.S. Army Engineer District, Rock Island, or his designee.

(5) The term "highway" shall mean any highway, thoroughfare, roadway, street, or other public or private road or way.

ARTICLE 2 - OBLIGATIONS OF THE PARTIES

a. The Government, subject to and using funds provided by the Local Sponsor and appropriated by the Congress, shall expeditiously

construct the project (including alterations or relocations of railroad bridges), applying those procedures usually followed or applied in Federal projects, pursuant to Federal laws, regulations, and policies. The Local Sponsor shall be afforded the opportunity to review and comment on all contracts, including relevant plans and specifications, prior to the issuance of invitations for bids. The Local Sponsor also shall be afforded the opportunity to review and comment on all modifications and change orders prior to the issuance to the contractor of a Notice to Proceed. The Government will consider the views of the Local Sponsor, but award of the contracts and performance of the work thereunder shall be exclusively within the control of the Government.

b. Upon completion of the project, the Government shall turn the completed project over to the Local Sponsor, which shall be solely responsible for operating, maintaining, and rehabilitating the project in accordance with Article 8 hereof.

c. As further specified in Article 6 hereof, the Local Sponsor shall provide, during the period of construction, a cash contribution of 5 percent of total project costs.

d. Notwithstanding any other provision of this Agreement, the Local Sponsor will contribute all project costs in excess of the Federal statutory limitation of \$5,000,000.

e. As further specified in Article 3 hereof, the Local Sponsor shall provide all lands, easements, rights-of-way, and dredged material disposal areas, and perform all relocations and alterations of buildings, utilities, highways, railroads (other than railroad bridges), bridges, sewers, and related and special facilities

determined by the Government to be necessary for construction of the project.

f. If the value of the contributions provided under paragraphs c., d., and e. of this Article represents less than 25 percent of total project costs, the Local Sponsor shall provide during the period of construction an additional cash contribution in the amount necessary to make its total contribution equal to 25 percent of total project costs.

g. The Local Sponsor will publicize floodplain information in the areas concerned and provide this information to zoning and other regulatory agencies for their guidance and leadership in preventing unwise future development in the floodplain and in adopting such regulations as may be necessary to ensure compatibility between future development and protection levels provided by the project.

h. The Local Sponsor will, at least annually, notify persons in the affected area that the project will not provide complete protection.

ARTICLE 3 - LANDS, FACILITIES, AND RELOCATION ASSISTANCE

a. Prior to the advertisement of any construction contract, the Local Sponsor shall furnish without cost to the Government all lands, easements, and rights-of-way, including suitable borrow and dredged material disposal areas, as may be determined by the Government to be necessary for construction of the project, and shall furnish to the Government evidence supporting the Local Sponsor's legal authority to grant rights-of-entry to such lands.

b. The Local Sponsor shall provide or pay to the Government the full cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins,

that may be required at any dredged material disposal areas necessary for construction of the project.

c. Upon notification from the Government, the Local Sponsor shall accomplish or arrange for accomplishment, at no cost to the Government, of all alterations and relocations of buildings, highways, railroads, bridges (other than railroad bridges), storm drains, utilities, cemeteries, and other facilities, structures, and improvements determined by the Government to be necessary for construction of the project.

d. The Local Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved January 2, 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE 4 - VALUE OF LANDS AND FACILITIES

a. The value of the lands, easements, and rights-of-way to be included in total project costs and credited toward the Local Sponsor's share of total project costs will be determined in accordance with the following procedures:

(1) If the lands, easements, or rights-of-way are owned by the Local Sponsor as of the date this Agreement is signed, the credit shall be the fair market value of the right-of-way interest at the time such interest is made available to the Government for construction of the project. The fair market value shall be determined by an appraisal, to be obtained by the Local Sponsor, which has been prepared by an independent and qualified appraiser who is acceptable to both the

Local Sponsor and the Government. The appraisal shall be reviewed and approved by the Government. The Local Sponsor will not receive credit for the cost of this appraisal.

(2) If the lands, easements, or rights-of-way are to be acquired by the Local Sponsor after the date this Agreement is signed, the credit shall be the fair market value of the right-of-way interest at the time such interest is made available to the Government for construction of the project. The fair market value shall be determined as specified in subparagraph (1) above. If the Local Sponsor pays an amount in excess of the appraised fair market value, it may be entitled to a credit for the excess if the Local Sponsor has secured prior written approval from the Government of its offer to purchase such interest.

(3) If the Local Sponsor acquires more lands, easements, or rights-of-way than are necessary for project purposes, as determined by the Government, then only the value of such portions of those acquisitions as are necessary for project purposes shall be included in total project costs and credited to the Local Sponsor's share.

(4) Credit for lands, easements, and rights-of-way in the case of involuntary acquisitions which occur after the date this Agreement is signed will be based on court awards, or on stipulated settlements that have received prior Government approval.

(5) For lands, easements, or rights-of-way acquired by the Local Sponsor after this Agreement is signed, credits provided under this paragraph a. will also include the actual incidental costs of acquiring the interest, e.g., closing and title costs, appraisal costs (except the appraisal in paragraph (1) above), survey costs, attorney's

fees, plat maps, and mapping costs, as well as the actual amounts expended for any relocation assistance provided in accordance with the obligations under this Agreement.

b. The costs of relocations or modifications of utilities or facilities that will be included in total project costs and credited towards the Local Sponsor's share of total project costs shall be that portion of the actual costs incurred by the Local Sponsor as set forth below:

(1) Highways and highway bridges: Only that portion of the cost as would be necessary to construct substitute bridges and highways to the design standard that the State of Iowa would use in constructing a new bridge or highway under similar conditions of geography and traffic loads.

(2) Utilities and facilities (including railroads): Actual relocation costs, less depreciation, less salvage value, plus the cost of removal, less the cost of betterments. With respect to betterments, new materials shall not be used in any relocation or alteration if materials of value and usability equal to those in the existing facility are available or can be obtained as salvage from the existing facility or otherwise, unless the provision of new material is more economical. If, despite the availability of used material, new material is used, where the use of such new material represents an additional cost, such cost will not be included in total project costs.

ARTICLE 5 - CONSTRUCTION PHASING AND MANAGEMENT

a. To provide for consistent and effective communication between the Local Sponsor and the Government during the term of construction, the Local Sponsor and the Government shall appoint representatives to

coordinate on scheduling, plans, specifications, modifications, contract costs, and other matters relating to construction of the project.

b. The representatives appointed above shall meet as necessary during the term of project construction and shall make such recommendations as they deem warranted to the Contracting Officer.

c. The Contracting Officer shall consider the recommendations of the representatives in all matters relating to the project, but the Contracting Officer, having ultimate responsibility for construction of the project, has complete discretion to accept, reject, or modify the recommendations.

ARTICLE 6 - METHOD OF PAYMENT

a. The Local Sponsor shall provide, over the term of construction, the amounts required under Articles 2c., 2d., and 2e. of this Agreement. Total project costs are presently estimated to be \$_____, of which an estimated \$_____ will be in the form of lands, easements, rights-of-way, and utility and facility alterations and relocations to be provided by the Local Sponsor. In order to meet its share, the Local Sponsor must provide a total cash contribution presently estimated to be \$_____.

b. The required cash contribution shall be provided as follows: At least 30 calendar days prior to the issuance of the invitation for bids for the construction contract, the Government shall notify the Local Sponsor of its estimated share of project costs. Within 15 calendar days thereafter, the Local Sponsor shall provide the Government the full amount of the required contribution by delivering a check payable to "FAO, USAED, ROCK ISLAND" to the Contracting Officer representing the Government. At the time bids are opened, or in the event

that total project costs are expected to exceed the estimate given at the outset of construction, the Government shall immediately notify the Local Sponsor of any additional contribution it will be required to make to meet its share of the revised estimate. Within 5 calendar days thereafter, the Local Sponsor shall provide the Government the full amount of the additional required contribution.

c. Upon completion of the project and resolution of all relevant contract claims and appeals, the Government shall compute the total project costs and tender to the Local Sponsor a final accounting of its share of project costs. In the event the total contribution by the Local Sponsor is less than its minimum required share of project costs at the time of the final accounting, the Local Sponsor shall, within 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet its minimum required share of project costs. In the event the Local Sponsor has made cash contributions in excess of 5 percent of total project costs which result in the Local Sponsor's having provided more than its required share of project costs, the Government shall within 90 days of the final accounting, subject to the availability of appropriations, return said excess to the Local Sponsor; however, the Local Sponsor shall not be entitled to any refund of the 5 percent cash contribution required pursuant to Article 2c. hereof. If the Local Sponsor's total contribution under this Agreement (including lands, easements, rights-of-way, relocations, and dredged material disposal areas provided by the Local Sponsor) exceeds 50 percent of total project costs, the Government shall, subject to the availability of appropriations, refund the excess to the Local Sponsor within 90 days of the final accounting.

ARTICLE 7 - DISPUTES

Before any party to this Agreement may bring suit in any court concerning an issue relating to this Agreement, such party must first seek in good faith to resolve the issue through negotiations or other forms of non-binding alternative dispute resolution mutually acceptable to the parties.

ARTICLE 8 - OPERATION, MAINTENANCE AND REHABILITATION

a. The Local Sponsor shall operate, maintain, replace, and rehabilitate the project upon completion in accordance with regulations or directions prescribed by the Government.

b. The Local Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon land which it owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, repairing, maintaining, replacing, or rehabilitating the project. If an inspection shows that the Local Sponsor for any reason is failing to fulfill the obligations under this Agreement without receiving prior written approval from the Government, the Government will send a written notice to the Local Sponsor. If the Local Sponsor persists in such failure for 30 calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon lands the Local Sponsor owns or controls for access to the project for the purpose of completing, operating, repairing, maintaining, replacing, or rehabilitating the project. No completion, operation, repair, maintenance, replacement, or rehabilitation by the Government shall operate to relieve the Local Sponsor of responsibility to meet its obligations as set forth in this Agreement, or to preclude

the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to this Agreement.

ARTICLE 9 - RELEASE OF CLAIMS

The Local Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the project, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE 10 - MAINTENANCE OF RECORDS

The Government and the Local Sponsor shall keep books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to this Agreement to the extent and in such detail as will properly reflect total project costs. The Government and the Local Sponsor shall maintain such books, records, documents, and other evidence for a minimum of three years after completion of construction of the project and resolution of all claims arising therefrom, and shall make available at their offices at reasonable times, such books, records, documents, and other evidence for inspection and audit by authorized representatives of the parties to this Agreement.

ARTICLE 11 - FEDERAL AND STATE LAWS

In acting under its rights and obligations hereunder, the Local Sponsor agrees to comply with all applicable Federal and state laws and regulations, including Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army".

ARTICLE 12 - RELATIONSHIP OF PARTIES

The parties to this Agreement act in an independent capacity in the performance of their respective functions under this Agreement, and neither party is to be considered the officer, agent, or employee of the other.

ARTICLE 13 - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, or resident commissioner, shall be admitted to any share or part of this Agreement or to any benefit that may arise therefrom.

ARTICLE 14 - COVENANT AGAINST CONTINGENT FEES

The Local Sponsor warrants that no person or selling agency has been employed or retained to solicit or secure this Agreement upon agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Local Sponsor for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Agreement without liability, or, in its discretion, to add to the Agreement or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

ARTICLE 15 - TERMINATION OR SUSPENSION

a. If at any time the Local Sponsor fails to make the payments required under this Agreement, the Secretary of the Army shall terminate or suspend work on the project until the Local Sponsor is no longer in arrears, unless the Secretary determines that continuation of work on the project is in the interest of the United States. Any delinquent payment shall be charged interest at a rate, to be

determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury Bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceed 3 months.

b. If the Government fails to receive annual appropriations in amounts sufficient to meet project expenditures for the then-current or upcoming fiscal year, the Government shall so notify the Local Sponsor. After 60 days either party may elect without penalty to terminate this Agreement or to suspend performance thereunder, and the parties shall conclude their activities relating to the project and proceed to a final accounting in accordance with Article 6.

ARTICLE 16 - NOTICES

a. All notices, requests, demands, and other communications required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally, given by prepaid telegram, or mailed by first-class (postage prepaid), registered, or certified mail, as follows:

If to the Local Sponsor:

Mayor of Delwein
City Hall
20 - 2nd Ave. S.W.
Delwein, Iowa 50662

If to the Government:

District Engineer
U.S. Army Engineer District, Rock Island
Clock Tower Building, P. O. Box 2004
Rock Island, Illinois 61204-2004

b. A party may change the address to which such communications are to be directed by giving written notice to the other in the manner provided in this section.

c. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at such time as it is personally delivered or on the third business day after it is mailed, as the case may be.

ARTICLE 17 - CONFIDENTIALITY

To the extent permitted by the law governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THE DEPARTMENT OF THE ARMY

By _____

Date: _____

THE CITY OF OELWEIN, IOWA

By _____
Mayor

Date: _____

CERTIFICATE OF AUTHORITY

I, _____, do hereby certify that I am the City Attorney for Oelwein, Iowa, that the City of Oelwein is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the City of Oelwein, Iowa, for local cooperation in connection with a flood control project on Dry Run Creek at Oelwein, Iowa, and to pay damages, if necessary, in the event of its failure to perform in accordance with Section 221 of Public Law 91-611, and that the person who has executed the Agreement on behalf of the City has acted within his statutory authority.

IN WITNESS WHEREOF, I have hereunto made and executed this Certificate this _____ day of _____, 198_____.

City Attorney for Oelwein, Iowa



United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
175 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

February 20, 1987

ER 87/21

Colonel Neil A. Smart
District Engineer
Rock Island District, Corps of Engineers
Clock Tower Building
Post Office Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

The Department of the Interior (Department) has reviewed the Draft Definite Project Report (DPR) for Flood Damage Reduction at Oelwein, Iowa. Consolidated Departmental comments are hereby provided for your consideration during future project planning efforts.

Personnel of the Bureau of Mines have reviewed the subject document to determine whether mineral resources and mining activities are adequately addressed. The recommended flood mitigation project would modify the channel of Dry Run Creek within the city of Oelwein, Iowa. Channel modification would include clearing the channel of debris, widening the channel bottom, and reshaping channel side slopes.

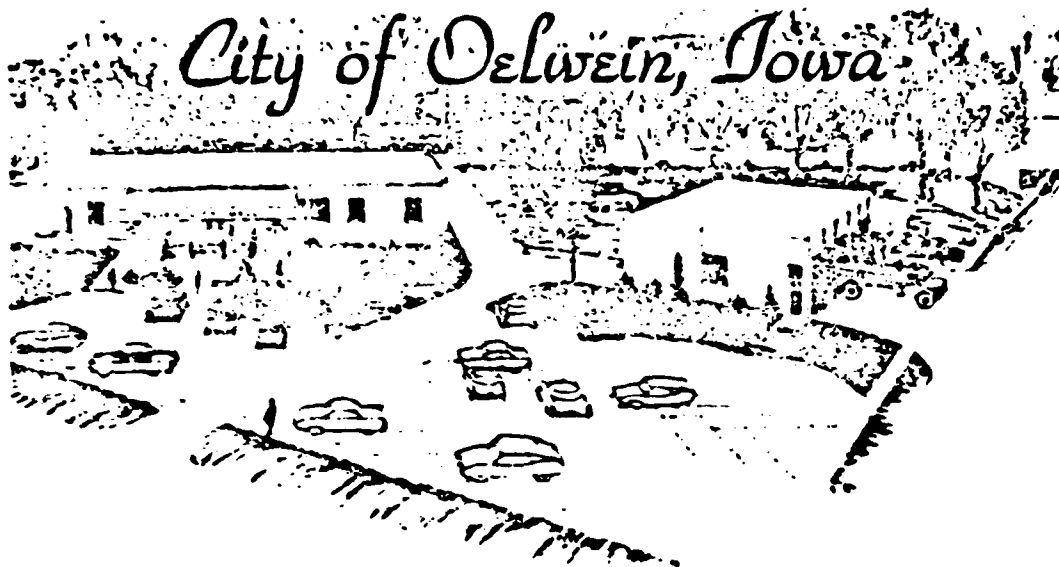
The Bureau of Mines concurs with the statement on page EA-8 declaring that impacts of the proposed project on mineral resources would be minimal owing to the organized nature of the project site. Accordingly, they have no additions or corrections to the document or objections to the project as described.

The Fish and Wildlife Service reviewed the subject document and found that their concerns have been adequately incorporated. Therefore, they have no objection to the Finding of No Significant Impact. They also concur with the conclusion that the project will not affect the threatened northern wild monkshood (Aconitum nove boracense).

Thank you for the opportunity to review these project documents. We stand ready to provide assistance and expertise at your request in the future.

Sincerely yours,


Sheila Minor Huff
Regional Environmental Officer



City Hall

20 - 2nd Avenue South West
Oelwein, Iowa 50662
(319) 283-5440

April 1, 1987

Colonel Neil A. Smart
District Engineer
U. S. Army Engineer District,
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

The City of Oelwein, Iowa, has reviewed the draft of the proposed Local Cooperation Agreement covering streambank erosion control on Dry Run Creek at Oelwein, Iowa. The Agreement includes the following obligations to be carried out by the City:

- (a). Provide, without cost to the Government, during the period of construction, all lands, easements, rights-of-way, and utility and facility alterations and relocations required for construction and maintenance of the project, regardless of their value.
- (b). Make 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) above. If the value of the items in (a) above is less than 20 percent of total project costs, the City shall, during the period of construction, make such additional cash payments as are necessary to bring its total contribution in cash and 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.
- (c). Contribute all project costs in excess of the Federal statutory limitation of \$5,000,000.
- (d). Hold and save the Government free from all damages arising from the construction, operation, maintenance, and rehabilitation

of the completed project, except for damages due to the fault or negligence of the Government or its contractors.

- (e). Operate, maintain, and rehabilitate the project upon completion in accordance with regulations or directions prescribed by the Secretary of the Army.
- (f). Accomplish without cost to the United States all alterations and relocations of buildings, transportation facilities, storm drains, utilities, and other structures and improvements made necessary by construction of the project.
- (g). Prevent encroachment on any of the flood protection structures, including ponding areas, and if ponding areas are impaired, provide substitute storage capacity or equivalent pumping capacity promptly without cost to the United States.
- (h). Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved January 2, 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.
- (i). Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) 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 construction, operation, and maintenance of the project.
- (j). Prior to construction, and in accordance with the provisions of Section 221 of Public Law 91-611, the City will enter into a contract with the Government whereby the City will grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the City owns or controls for access to the project, for the purpose of inspection, and, if necessary, for the purpose of completing, operating, repairing, maintaining and rehabilitating the project. If an inspection shows that the City for any reason, is failing to complete, operate, repair, maintain or rehabilitate the project in accordance with the assurances hereunder, the Government will send a written notice to the City. If the City persists in such failure for thirty (30) calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon the land that the City owns or controls for access to the project for the purpose of completing, operating, repairing, maintaining and rehabilitating the project. No completion, operation, repair, maintenance, or

Colonel Neil A. Smart -- 3

rehabilitation by the Government shall operate to relieve the City of responsibility to meet its obligations as set forth in the Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to the Agreement.

The City is willing and able to pay its share of the total project costs. Sufficient funds are on hand or can be raised quickly, and the cash payment can be deposited directly with the Government, or in an escrow account, upon demand by the Government.

This is to advise that if the Detailed Project Report for this project is approved substantially in its present form as reviewed by the City and as submitted for approval by Corps of Engineers' higher authority, the City is willing, and legally and financially able, to sign the referenced Local Cooperation Agreement which includes the obligations set forth above.

It is the City's understanding that this is a letter of intent only, that the City reserves the right to review the final Non-Federal cost estimates before it commits itself to the project.

Sincerely,



Beth McFarlane
Mayor

BM/wj



United States Department of the Interior

FISH AND WILDLIFE SERVICE

ROCK ISLAND FIELD OFFICE (ES)

1830 Second Avenue, Second Floor

Rock Island, Illinois 61201

IN REPLY REFER TO:

COM: 309-793-5800

FTS: 386-5800

June 4, 1987

Colonel William C. Burns, Jr.
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Burns:

This constitutes our final Fish and Wildlife Coordination Act Report for your Detailed Project Report to reduce flood damage along Dry Run Creek in the City of Oelwein, Fayette County, Iowa. It has been prepared under the authority of and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the National Environmental Policy Act of 1969, as amended; the Endangered Species Act of 1973, as amended; and in accordance with the Fish and Wildlife Service's Mitigation Policy.

Information for this report was provided by your staff, your 1985 Reconnaissance Report, and a site visit by a Service biologist. Our draft report was coordinated with the Iowa Department of Natural Resources.

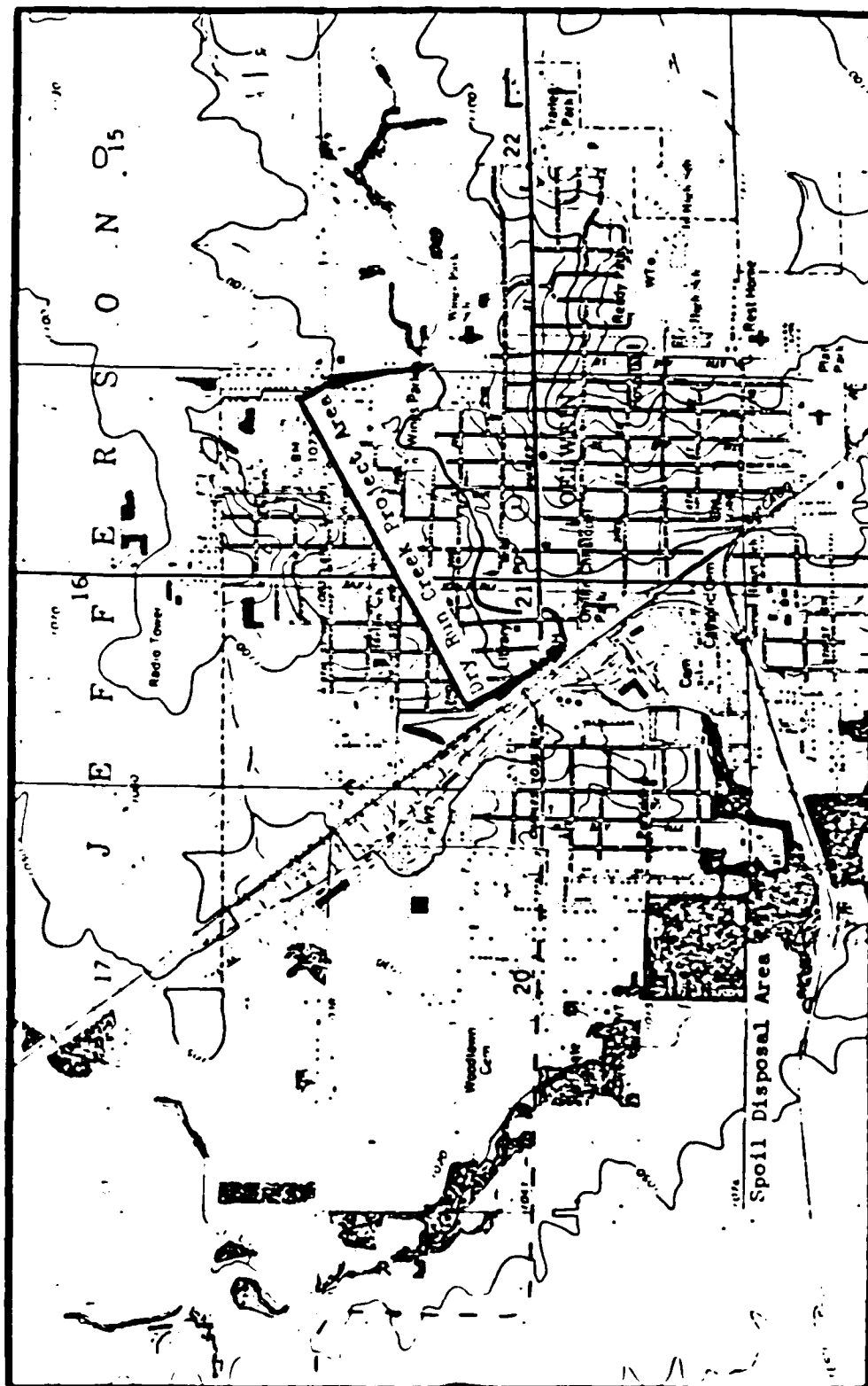
Description of Project

The project proposed to reduce flood damages in Oelwein is a combination of channel clearing and widening in Dry Run Creek from Eighth Avenue Northeast downstream to the twin box culverts near Second Avenue Southwest (Figure 1). The proposed project will involve clearing all debris from the channel, widening the channel bottom to a uniform 20-foot width, and reshaping the channel sides to a 2 on 1 slope. We understand that the existing thalweg and channel alignment will not be substantially altered. Further, the right-of-way may restrict the extent of channel modifications because no existing buildings are to be removed or demolished.

Several possible alternatives are being considered, including a 25-30 foot bottom width for increased channel capacity, 3:1 side slopes for easier maintenance, and riprapping of the channel particularly below bridges where high discharge velocities may cause channel scouring.

Channel widening will require the excavation of approximately 7000 cubic yards of material. A potential dredged material disposal site has been identified in the northwest portion of Oelwein near the Iowa Ham building.

Figure 1. Location of Dry Run Creek Project and proposed spoil disposal area.



Fish and Wildlife Resources in the Project Area

The project area is entirely urban, ranging from Wings Park at the upstream end, through residential, then business and commercial districts near the railroad culverts. The habitats for wildlife are limited to mixed grasses and forbs which grow on the creek banks, scattered trees along the stream and the manicured residential yards and playing fields in Wings Park. These areas provide habitat for urban tolerant wildlife species such as squirrels, rabbits, woodpeckers, and song birds. Robins, grackles, yellow-shafted flickers, eastern kingbirds, sparrows and raccoon tracks were observed in and near the project area during the site visit on May 20, 1986.

Dry Run Creek is an intermittent riverine wetland with a sand bottom. It is a low gradient stream with pool and riffle habitat formed by pockets of rubble. Dry Run Creek was 7 to 8 feet wide and 4 to 5 inches deep just downstream of the Eighth Avenue NE Bridge, increasing to 10 to 12 feet wide and 8 to 12 inches deep near the First Avenue Bridge downtown. There are no data on the fish species in the stream. Several dozen minnows were observed in Dry Run Creek just upstream of the twin culverts near the Chicago and Northwestern Rail Road at Second Avenue SW. Because of the intermittent nature of the stream, it probably does not support a permanent fishery.

We have no data on the water quality in Dry Run Creek. On May 20, 1986 the water flowing through the project area was very clear, showing little evidence of sediment from a 2 1/2-inch rain three days prior to the visit.

A spoil disposal site was identified in your letter of October 1, 1986. We concurred with the selection of site 1, located near the Iowa Ham Building at Third Street and Ninth Avenue Northwest in our letter of October 16, 1986. The site is an old field, now vegetated with forbs, woody shrubs and scattered small trees. This area provides food and cover for a variety of small mammals and birds.

Endangered Species

The northern wild monkshood (Aconitum noveboracense) is the only Federally endangered or threatened species listed for Fayette County. There is no designated critical habitat in the project area at this time. There is also no suitable habitat for the northern wild monkshood in the project area. This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. Should this project be modified, or new information indicates endangered species may be affected, consultation should be initiated.

Project Impacts on Fish and Wildlife Resources

A. Future Without Project

Habitats for fish and wildlife in the project area are not likely to change significantly in the future if the proposed project is not constructed. Due to the urban nature of the project area, habitat conditions may deteriorate slightly if the population of Oelwein increases.

B. Future With Project

The impacts of the proposed project will vary in magnitude and significance depending on the reach of the stream. For terrestrial resources, channel widening will have the greatest impact on ground dwelling species. Moles, voles, ground squirrels and rabbits which burrow in and nest under or on the ground will be displaced, as will birds and mammals which utilize the trees and shrubs along the creek. The impacts should be mostly temporary, lasting until vegetation is reestablished on the widened channel bottom and the side slopes.

The impacts to the aquatic habitat have the greater potential for long-term harm depending on the final approach to and specifications for the channel widening. If, as described, the existing thalweg and channel alignment are not altered, the only impacts will be temporary increases in erosion and turbidity from the excavation to widen the channel.

A longer term impact will be the warming of the stream due to the removal of trees from the existing stream bank. Any alteration of the thalweg or channel alignment will have significant but localized impact on the aquatic habitat resulting in the loss of the pool and riffle habitat.

Utilization of the preferred dredged material disposal site will result in the temporary loss of habitat for small mammals and birds. These impacts would be minimized if disposal were limited to the area immediately adjacent to the Iowa Ham Parking lot, and the dredged material shaped and planted to grass species beneficial to wildlife.

Mitigation

In accordance with our Mitigation Policy (46 FR 7644-7655), we have evaluated the habitats to be impacted by the proposed project in order to determine Resource Categories and proper mitigation goals.

Resource Category 1 - Habitat is of high value and is unique and irreplaceable in the nation or ecoregion. Goal - no loss of existing habitat value. Guideline - the Service will recommend that all losses of existing habitat be prevented as these on-of-kind areas cannot be replaced. Insignificant changes are acceptable provided they will have no cumulative impact.

Resource Category 2 - Habitat is of high value and is relatively scarce or becoming scarce in the nation or ecoregion. Goal - no net loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified or eliminated over time can be compensated by replacement with the same kind of habitat so that the total or net loss is zero.

Resource Category 3 - Habitat is of high to medium value and is relatively abundant in the nation. Goal - no net loss of habitat value while minimizing loss of in-kind habitat value. Guideline - losses that

cannot be otherwise avoided, minimized, rectified, eliminated over time or compensated by in-kind replacement can be compensated by replacement with other habitat types so that the total or net loss is zero.

Resource Category 4 - Habitat is of medium to low quality. Goal - minimize loss of habitat value. Guideline - the Service will make recommendations to avoid, minimize, rectify or eliminate losses over time depending on the significance of the potential loss. Such areas are good candidates for mitigation of Resources Category 2 and 3 losses by management or enhancement to increase their habitat value.

Based on the foregoing discussion, we have assigned the habitats in the project area as follows.

Category 3 - Pool and riffle habitats in Dry Run Creek.

Category 4 - Terrestrial habitats along Dry Run Creek and the dredged material disposal site.

Discussion

Construction of the proposed project on Dry Run Creek will have limited, mostly temporary, adverse impacts on fish and wildlife resources in the project area and dredged material disposal area. In comparison with the no action alternative, measures proposed to reduce scouring below bridges and revegetate areas disturbed during construction may have a net positive effect on fish and wildlife resources.

The only change from our draft report is the discussion of the preferred dredged material disposal site. Originally, a disposal site in a palustrine forested was considered. As described in this report, an upland site has since been selected which is acceptable. Utilization of the preferred site will result in the temporary loss of terrestrial habitat.

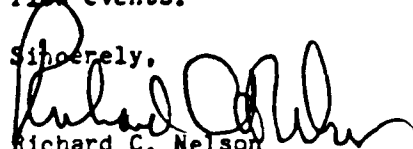
Conclusions and Recommendations

Based on the foregoing discussion of the proposed project, resources, impacts and mitigation policy, we have the following recommendations.

1. Channel clearing should be limited to the removal of debris and sediment accumulated at bridges.
2. Channel widening should not disrupt the natural meandered channel, or a meandered subchannel should be placed in the bottom of the widened channel to provide pools and riffles.
3. The widened channel bottom and side slopes should be revegetated with grass species beneficial to wildlife. Trees removed should be replaced on a 3:1 basis.
4. Dredged material should be shaped and revegetated with grass species beneficial to wildlife.

If the above recommendations are followed, a greenbelt along the stream would result, providing wildlife habitat and aesthetic benefits which would not adversely affect flows and storage during high flow events.

Sincerely,



Richard C. Nelson
Field Supervisor

cc: IDNR (Wilson, Konrad, Hayes)
USEPA (Barber)
Div. of Ecological Services
Branch of Federal Activities, Wash. D.C.



TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

LARRY J. WILSON, DIRECTOR

June 15, 1987

Pat Burke
U.S. Army Engineers District
Attn: Planning Division
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

Subject: Draft DPR with Environmental Assessment, Dry Run Creek,
Fayette Co., Oelwein, Iowa

Dear Mr. Burke:

Review of the Dry Run Creek Flood Control Project has been completed by field personnel. The DNR concurs with the Fish and Wildlife Service comments relative to the spoil site (letter on page D-19) and project. The DNR requests that the landscaping, revegetation and future management of the project including the spoil site be consistent with beautification, wildlife habitat and others environmental concerns.

Sincerely,

LARRY J. WILSON, DIRECTOR
DEPARTMENT OF NATURAL RESOURCES

LJW/sl

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FLOOD CONTROL PROJECT
DRY RUN CREEK, FAYETTE COUNTY
OELWEIN, IOWA

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WATERLOO, IA 50701

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HONORABLE TOM HARKIN, UNITED STATES SENATOR
733 FEDERAL BUILDING, 210 WALNUT STREET
DES MOINES IA 50309

R

HONORABLE THOMAS J. TAUKE, REPRESENTATIVE IN CONGRESS
1756 FIRST AVENUE N.E., CEDAR RAPIDS, IA 52402

R

CHIEF, INTERMOUNTAIN FLD OPNS CENTER
BUREAU OF MINES-INTERIOR DEPT, DENVER FED CENTER - BLDG 20
DENVER CO 80225

MR. JACK RUDY, NATIONAL PARK SVE., USDI
ROCKY MT. REGNL OFC, P.O. BOX 25287
DENVER, CO 80225

OFFICE OF ENVIRONMENTAL PROJ REVIEW, DEPARTMENT OF INTERIOR
14TH & C STREETS NW - ROOM 4241, WASHINGTON DC 20240

18 R

DIRECTOR, OFFICE OF HABITAT PROTECTION
NATIONAL MARINE FISHERIES SERVICE, NOAA
WASHINGTON DC 20235

WATER RESOURCES-MOSC CONTR, DIVN OF PARASITIC DIS/C-23
ATTN: JAMES M STEWART, CENTER FOR DISEASE CONTROL
ATLANTA GA 30333

REGIONAL ENGINEER, FERC REGIONAL OFFICE
FEDERAL BLDG - 31ST FLOOR, 230 S DEARBORN ST
CHICAGO IL 60604

MR RICHARD NELSON - FIELD SUPRVR, U.S.FISH & WILDLIFE SERVICE
1830 SECOND AVE. - 2ND FLOOR, ROCK ISLAND, IL 61201

R

DIRECTOR, FARMERS HOME ADMINISTRATION
US DEPT OF AGRICULTURE, FEDERAL BLDG., ROOM 873
DES MOINES, IA 50309

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GERALD HUFF, SOIL CONSERVATION SERVICE
1004 4TH ST SE, WEST UNION IA 52175

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STATE CONSERVATIONIST, SOIL CONSERVATION SERVICE USDA
693 FEDERAL BLDG, 210 WALNUT STREET
DES MOINES IA 50309

2R

GEOLOGICAL SURVEY BUREAU, ENERGY AND GEOLOGICAL RESOURCES DIVN
IOWA DEPT OF NATURAL RESOURCES, 123 NORTH CAPITOL STREET
IOWA CITY IA 52240

WATER RES. RESEARCH CENTER, ATTN DR AL AUSTIN
355 TOWN ENGINEERING BUILDING, IOWA STATE UNIVERSITY
AMES IA 50010

R

MR MORRIS KAY - ADMINISTRATOR, U S ENVIRONMENTAL PROTECTION AGENCY
726 MINNESOTA AVENUE, KANSAS CITY KS 66101

3R

AREA DIRECTOR-MINNEAPOLIS AREA, BUREAU OF INDIAN AFFAIRS
15 SOUTH 5TH STREET, MINNEAPOLIS, MN 55401

REGIONAL DIRECTOR, REGION 3, U.S.FISH AND WILDLIFE SERVICE
FEDERAL BLDG FORT SNELLING, TWIN CITIES MN 55111

R

REGIONAL ADMINISTRATOR, FEDERAL HIGHWAY ADMN - REG 7
PO BOX 19715, KANSAS CITY MO 64141

REGIONAL DIRECTOR, REGION VIII
FEDERAL RAILROAD ADMINISTRATION, 2903 FEDERAL OFFICE BLDG
KANSAS CITY MO 64106

REGIONAL HYDROLOGIST, NATIONAL WEATHER SERVICE
1735 NEW FEDERAL OFFICE BLDG, 601 E 12TH ST
KANSAS CITY MO 64106

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REGIONAL FORESTER, FOREST SERVICE
US DEPT OF AGRICULTURE, 310 W WISCONSIN AVE-SUITE 500
MILWAUKEE WI 53203

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HONORABLE TERRY BRANSTAD, GOVERNOR OF IOWA
STATE CAPITOL, DES MOINES, IA 50319

R

IOWA DEPT OF ECONOMIC DEVELOPMENT, DIVN OF COMMUNITY PROGRESS
200 EAST GRAND AVENUE, DES MOINES IA 50319

4R

MR LARRY WILSON - DIRECTOR, DEPT OF NATURAL RESOURCES
WALLACE STATE OFFICE BLDG, 900 EAST GRAND AVENUE
DES MOINES IA 50319

MR RALPH TURKLE, DEPT OF NATURAL RESOURCES
WATER QUALITY PLANNING SECTION, WALLACE STATE OFFICE BUILDING
DES MOINES IA 50319

DIRECTOR, IOWA DEPT OF HEALTH
LUCAS BLDG 3RD FLOOR, DES MOINES IA 50309

DIRECTOR, IOWA DEPARTMENT OF TRANSPORTATION
OFFICE OF POLICY, 800 LINCOLN WAY
AMES, IA 50010

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DES MOINES IA 50319

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DEAN ROOSA, STATE ECOLOGIST
WALLACE STATE OFFICE BLDG, EAST NINTH ST AND GRAND AVE
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