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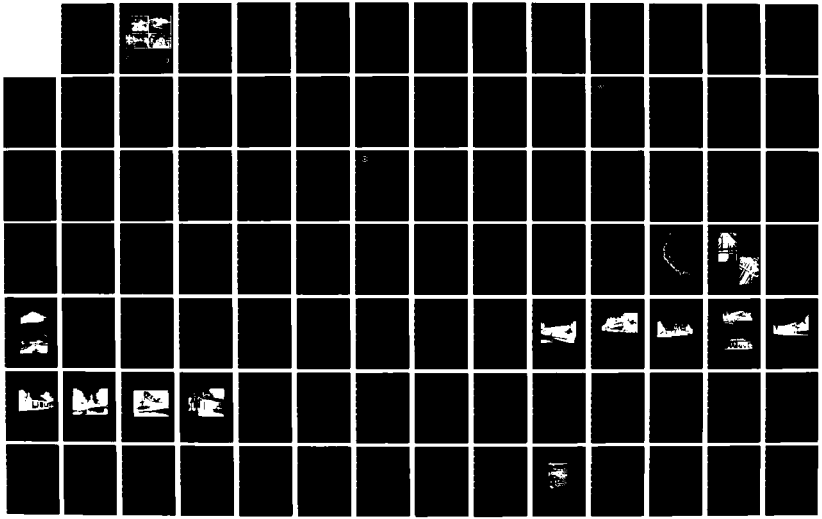

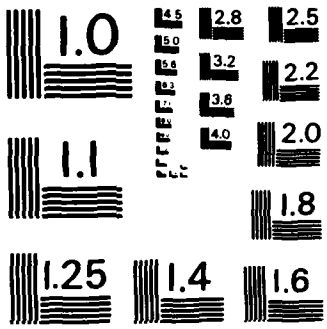

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STE. GENEVIEVE, MISSOURI
FEASIBILITY REPORT

AD-A161 291

FLOOD CONTROL STUDY
FOR HISTORIC STE. GENEVIEVE — 80061

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VOLUME ONE
MAIN REPORT
FINAL ENVIRONMENTAL IMPACT STATEMENT
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85 11 18 147

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER

2. GOVT ACCESSION NO. AD A161 291

3. RECIPIENT'S CATALOG NUMBER

4. TITLE (and Subtitle)

Ste. Genevieve, Missouri Feasibility Report (Flood Control Study For Historic Ste. Genevieve - 80061) Vol. 1, Main Report, Final Environmental Impact Statement, Public Views and Responses.

5. TYPE OF REPORT & PERIOD COVERED

Feasibility Report

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)

James Zerega, David Gates, George Knight, Daniel Marshall, John Brady, Dennis Woodruff

8. CONTRACT OR GRANT NUMBER(s)

Not Applicable

9. PERFORMING ORGANIZATION NAME AND ADDRESS

U.S. Army Engr. Dist., St. Louis
210 Tucker Blvd., N.
St. Louis, MO 63101

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS

12. REPORT DATE

June 1984

13. NUMBER OF PAGES

800

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)

U.S. Army Engineer Div., Lower Mississippi Valley
P.O. Box 80
Vicksburg, MS 39180

15. SECURITY CLASS. (of this report)

Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for release, distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Report addresses the feasibility of Federal participation in a flood protection project for the historic community of Ste. Genevieve, Missouri. The town was founded in the 1700's by French colonists. Much of the community has been designated a Registered National Historic Landmark. Flooding is primarily from the Mississippi River. The proposed plan includes a major levee and pump station, tributary channel widening and other features, and costs $33,580,000 at October 1984 price levels. Benefits include historic preservation and reduction in flood damages.

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SUPPLEMENTAL REPORT

STE. GENEVIEVE, MISSOURI

MARCH 1985

PREPARED BY

U.S. ARMY CORPS OF ENGINEERS
LOWER MISSISSIPPI VALLEY DIVISION
VICKSBURG, MISSISSIPPI

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SUPPLEMENTAL REPORT

STE. GENEVIEVE, MISSOURI

1. Introduction. The purpose of this supplemental report is to provide additional information in support of the Division Engineer's recommendation. It includes a statement of the District Engineer's findings and recommendation, a discussion of facts which led to the determination that an exception to Corps policy is warranted, justification for the exception to policy, and the Division Engineer's recommendation.

2. District Commander's Findings and Recommendation. The District Engineer believes that historic preservation in Ste. Genevieve is in the Federal interest, and that substantial flood protection similar to Plan 1 in the report would be a necessary part of any general effort to protect and enhance the historic resource in the community. However, the report recommends that no Federal action by the Corps of Engineers is warranted due to the lack of economic justification for any alternatives formulated for flood damage reduction using current National Economic Development criteria.

3. Facts Considered by the Division Commander.

a. Determination of Public Interest.

(1) National Interest.

(a) The National Historic Landmark program was established by the Park Service pursuant to the Historic Sites Act of 1935 (P.L. 74-292; 16 U.S.C. 461-67). In 1965 the National Park Service, Department of the Interior, designated a large portion of Ste. Genevieve as a National Historic Landmark District. Because the Ste. Genevieve National Historic Landmark District had attained National Landmark distinction, it also became listed on the National Register of Historic Places, when that register was established by the National Historic Preservation Act of 1966 (P.L. 89-665; amended 1980 by P.L. 96-515; 16 U.S.C. 470). Ste. Genevieve is significant and unique because it has been occupied continuously since it was settled by French Colonists in the 18th Century and because its earliest French colonial Buildings did not disappear during the town's growth. One-fourth of all of North America's French colonial buildings are located in Ste. Genevieve. Most important is that Ste. Genevieve contains the only collection of French colonial houses anywhere on the continent. Outside of Ste. Genevieve, they are found only in isolation. Also, Ste. Genevieve is the only place where houses of the French poteaux-en-terre construction still exist. The first brick building west of the Mississippi River was built, and still stands, in Ste. Genevieve.

(b) The National Endowment for the Humanities has granted $149,044 to the University of Missouri for studies of the historic resources of Ste. Genevieve. The Great River Road Commission has granted $1,400,000 to the city of Ste. Genevieve for the purpose of improving access to the Historic District and for historically compatible improvements to streets,

sidewalks, and lighting within the District. The Society of Colonial Dames, a National organization, owns and operates the Bolduc house (built in 1770), opening it for visitation on a daily basis between April and November.

(c) Section 1 of the Historic Sites Act of 1935 states that " . . . it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States." Section 1(b) of Public Law 96-515 states that "(1) the spirit and direction of the Nation are founded upon and reflected in its historic heritage; (2) the historical and cultural foundations of the Nation should be preserved as a living part of our community life and development . . .(3) historic properties significant to the Nation's heritage are being lost or substantially altered, often inadvertently, with increasing frequency; (4) the preservation of this irreplaceable heritage is in the public interest so that its vital legacy . . . will be maintained and enriched for future generations of Americans . . ."

(2) State Interest. The State of Missouri operates the Felix Valle house (built in 1818) as a State Historic Site. The house and grounds were donated to the State, which restored the house at a cost of $150,000. Another $45,000 has been spent thus far in acquiring period furniture. In the next decade, the State expects to spend $390,000 on the house and grounds. The site is open to public visitation on a daily basis, and the State employs a full-time staff of three people. In addition, the University of Missouri is conducting an inventory of historic buildings in Ste. Genevieve, under the auspices of the Missouri Heritage Commission.

(3) City Interest. The city is very interested in restoration, has legislated protection of historic buildings, and is a local sponsor willing to share in costs of a project. The city is in the process of rewriting and updating protective requirements for the historic district and buildings in the community.

(4) Private Interests. Local citizens, businesses, and organizations have accomplished major preservation and restoration of approximately 64 buildings at a total estimated cost of $4,530,000. For example, one individual acquired a historic residence for less than $20,000 and is spending in excess of $125,000 restoring it to its original condition. During 1983 and 1984, 15 new businesses chose to locate in historic buildings. The Foundation for Restoration of Ste. Genevieve is an active group, growing in members, which promotes restoration and provides information to interested parties. Restoration of historic buildings is a continuing program with several buildings presently being restored.

b. Deterioration of the National Landmark District due to Flooding. A close look at a map of the National Landmark District, with contours of flood frequencies shown, clearly demonstrates the National Landmark District is severely threatened by the 30-year (1973 flood), 50-year, 100-year, and 500-year flood events on the Mississippi River. Not only flooding that has occurred but also the threat of future flooding has an adverse effect on historic structures. Where flooding has actually occurred, buildings reflect varying degrees of physical damage. In some cases, buildings have been

damaged beyond repair and have been demolished. In addition, some structures have not been flooded but it is clear they would be damaged by a higher flood on the Mississippi River. With this threat of flood, many structures are not undergoing restoration, and consequently they are falling into a state of disrepair. The more flood-prone a structure the less chance it has of being preserved.

c. Corps Responsibility. The Corps of Engineers is the Federal agency recognized as the authority in planning, designing, and constructing flood protection systems throughout the United States. The Corps has numerous urban and agricultural flood protection projects over much of the length of the Mississippi River. Within the Ste. Genevieve area, urban protection systems include the St. Louis Metropolitan Area just north of Ste. Genevieve and Cape Girardeau just south of Ste. Genevieve. Congress directed the Corps to study the flooding problem in the Ste. Genevieve area and make recommendations on possible solutions. The District Commander's report on that study thoroughly documents the nationally and internationally valuable historic resource of Ste. Genevieve, the preservation of which is in the national interest. It also documents the flooding problem in the area and the need to expedite flood protection to preserve this resource. The District Engineer found Plan 1 as formulated in the report to be the best plan to provide the needed protection. The Corps of Engineers is the appropriate agency to provide this needed protection.

4. Conclusions.

a. The District Engineer's selected plan, Plan 1, is the best plan to provide the needed protection for Ste. Genevieve. The only reason he did not recommend authorization for implementation of Plan 1 by the Corps is because it was not economically justified. Current Corps regulations require the identification of at least one plan which maximizes net tangible benefits, which implies a B/C ratio of at least unity. Clearly, none of the plans formulated for Ste. Genevieve have traditional economic justification.

b. I have visited Ste. Genevieve and observed the uniqueness of the Historic District and the city's ongoing commitment to historic preservation. I have also observed the flood threat and need for protection. Without flood protection, large sections of the Historic District could be destroyed by a design flood on the Mississippi River and much of the historic resource would be lost. Any plan which would protect less than the entire Historic District would not be acceptable.

c. I have reviewed with great interest the District Engineer's findings, public views, and views of other agencies; and I am satisfied that the recommendation in the report is based on current policy regarding National Economic Development criteria. I have also reviewed the laws concerning National historic resources and preservation, such as the Historic Sites Act of 1935, the National Historic Preservation Act of 1966, as amended, and the National Environmental Policy Act of 1970. As discussed previously, I have determined that flood protection for these historic resources is in the Federal interest and that it is the Corps of Engineers' responsibility. Balancing the value of these resources to the Nation against the cost, I side

with the position of the Department of the Interior and the Advisory Council for Historic Preservation and have determined that the historic value of this unique community warrants an exception to Corps policy.

5. Justification for an Exception to Corps Policy.

a. Following current Corps of Engineers regulations, if a District or Division Engineer determines during the planning process that no plans formulated to resolve particular water resource problems have economic justification, he is to terminate the study and recommend no Corps implementation due to lack of economic justification for any plans formulated. These regulations further require identification of that plan which maximizes net tangible benefits (NED Plan) and the District Engineer is encouraged to select this plan as the recommended plan or give strong justification for departing from it. Since none of the plans formulated for the Ste. Genevieve area had economic justification, identification of an NED Plan is not possible. However, I have determined that an exception to this policy is warranted.

b. My reasons for departing from the policy have been discussed above but, in summary, rest on preserving the valuable National Historic Landmark District and structures which, due to their character and number, are extremely significant and unique. Further preservation and restoration of these resources is impractical and in some cases impossible without a Corps flood protection project. Under traditional economic criteria, the determination of benefits of protecting the historic structures in Ste. Genevieve is based on market value. Historic value has not and cannot be completely stated in traditional economic terms. However, if one assumes that a substantial number of the historic structures in the Landmark District would be restored if Plan 1 was implemented, the community would probably then have a significantly higher economic value many times existing market value. It would be somewhat comparable to intensification benefits shown for protection of agricultural land under traditional economic evaluation. I consider this potential value of Ste. Genevieve to be very significant.

c. As a part of my responsibility as a Division Engineer within the Corps of Engineers, I must daily ascertain that the requirements of all National laws, including those applicable to preserving or enhancing environmental and cultural resources of our Nation, are met in administering Corps of Engineers activities. Considerable Federal money is spent satisfying requirements of these laws without a traditional Corps economic analysis. These laws include the National Environmental Policy Act, Clean Water Act, Fish and Wildlife Coordination Act, Endangered Species Act, and the National Historic Preservation Act. I am convinced that protecting the National Historic Landmark District of Ste. Genevieve would be a justifiable expenditure of Federal dollars as well as an extension of fully complying with these laws.

6. Recommendation. I recommend that Plan 1, selected in the District Engineer's report as the best plan for flood protection and related purposes in the historic community of Ste. Genevieve, Missouri, be authorized for implementation as a Federal project, with such modifications as in the discretion of the Chief of Engineers may be advisable, at a first cost to the

United States presently estimated at $31,020,000 and with annual operation, maintenance, and replacement costs to the United States presently estimated at $0 provided that, except as otherwise provided in these recommendations, the exact amount of non-Federal contributions shall be determined by the Chief of Engineers prior to project implementation in accordance with the following requirements to which non-Federal interests must agree prior to implementation, subject to cost sharing and financing arrangements which are satisfactory to the President and the Congress.

a. Provide without cost to the United States all lands, easements, rights-of-way, relocations, and bridge replacements, including borrow areas and disposal areas for excavated material determined suitable by the Chief of Engineers and necessary for implementation of the project.

b. Hold and save the United States free from damages due to the construction work, operation, or maintenance of the project, excluding damages due to the fault or negligence of the United States or its contractors.

c. Maintain and operate all flood control, recreational, and environmental works, open to all on an equal basis and in accordance with regulations prescribed by the Secretary of the Army.

d. Provide a cash or in-kind contribution equal to 50 percent of the project cost allocated to recreation.

e. Publicize flood-plain 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 flood plain and in adopting such regulations as may be necessary to insure compatibility between future development and protection levels provided by the project.

f. At least annually, notify affected interests regarding the limitations of the protection afforded by the project.

g. Prescribe and enforce flood-plain management regulations for construction of the significant structures that may be located in the flood plain, such as residential and commercial structures, bridges, landfills, channel modifications, and other encroachments that might adversely affect the hydrologic/hydraulic characteristics and flood-carrying capacities of the selected plan.

h. Take appropriate actions to safeguard cultural resources in the National Historic Landmark District area, including actions to protect, preserve, and encourage restoration of historic building; protect archaeological sites; continue agricultural use of the Mississippi River bottomlands currently used for open space and agricultural production; and preserve the historic character in the Ste. Genevieve National Historic Landmark District through control of new development to insure its compatibility with the historic setting.

i. Comply with the provisions of Section 221 of P.L. 91-611, the Rivers and Harbors Act of 1970.

j. Comply with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, P.L. 91-646.

The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of

individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for authorization and/or implementation funding.

Thomas A. Sands
Brigadier General, U.S. Army
Division Engineer

March 1985

A D D E N D U M

This addendum to the June 1984 Ste. Genevieve, Missouri, Feasibility Report was prepared by the St. Louis District in support of the 15 October 1984 Division Engineer's notice which changed the recommendation of the reporting officer. The purpose of the addendum is to improve the Feasibility Report by adding recently developed information and additional description of certain parts of the plan formulation effort. Information is provided on the following topics: significance of flood damage, project scope, historic significance, level of protection, induced damages, the city's historic preservation ordinance, Section 404 evaluation, costs and benefits, and pump size and ponding area analysis.

1. Significance of Flood Damage.

a. In addition to the information in Section 2.5.2 of the MAIN REPORT and Section 3.2 of APPENDIX E, the following is provided. It should be added to the discussions on page 83 of the MAIN REPORT and page E-22 of APPENDIX E.

b. When the St. Louis District made its Urban Design II inventory in 1982, the condition of each building was noted. This information was updated in February 1985 by a revisit to each historic building included in the Urban Damage II inventory. For both 1982 and 1985 conditions, three categories are valid: the category "Restored" includes buildings fully restored to their original appearances; the category "Good" includes buildings that are intact and well-kept up, and that show only minor changes to their original appearances (for example, the addition of dormers to some French colonial houses); and the category "Deteriorated" includes buildings showing various combinations of poor general upkeep, significant modifications of original appearance, and structural fatigue, as evidenced by sagging (due to rotten floor joists), unrepaired damage to bricks and mortar, crumbling foundations of rock or concrete, missing or decomposing clapboards low on the walls, and so forth. Very few buildings have been entered by St. Louis District personnel, but some interiors have revealed flood-caused deterioration not immediately visible from outdoors. Some historic buildings are simply and visibly "falling apart."

c. In December 1984 the University of Missouri provided their nearly completed historic buildings inventory to the St. Louis District. The National Park Service plans to include these buildings in the official National Landmark inventory for Ste. Genevieve. The new inventory includes many more buildings than the earlier partially completed inventory that was the basis for the information on historic buildings presented in the June 1984 Feasibility Report. The District compared the new data to our Urban Damage II data on floodprone buildings and found that of the 463 historic buildings in Ste. Genevieve, 212 are subject to flooding and 51 were flooded above their first floors in 1973. The 161 floodprone historic buildings not flooded above their first floors in 1973 include 31 buildings that were protected by sandbags and a number of buildings that had basement flooding.

d. Structure conditions relative to the flood of 1973 are shown below, with comparisons made between 1982 and 1985 conditions:

Historic Structure Conditions in 1982 and 1985

	Flooded above first floor in 1973 (n = 51)		Other floodprone buildings (n = 161)	
Condition	1982	1985	1982	1985
Deteriorated	47.1%	60.8%	17.4%	14.3%
Good	52.9%	39.2%	74.5%	67.1%
Restored	0 %	0 %	8.1%	18.6%
	100.0%	100.0%	100.0%	100.0%

e. The trends in these data seem obvious and it is felt that they support the contentions made in Section 2.5.2 of the MAIN REPORT and in Section 3.2 of APPENDIX E. Three facts are most significant. First, among the floodprone structures not flooded in 1973, 17 historic buildings have been restored since 1982, at which time five were "Deteriorated" and 12 were "Good." Second, no historic building flooded in 1973 has been restored. Third, deterioration is continuing and increasing among buildings flooded in 1973.

f. The number and identity of any buildings demolished only because they could not be salvaged after the 1973 flood has not been determined. However, it seems true that deterioration, if left unabated, is a process that has destruction as its end point over time. Several historic buildings that have been repeatedly flooded are presently vacant. At least two of these have been unsuccessfully for sale during 1985. Another, flooded in 1973, 1979, 1982, and 1983, has been vacant since 1982. St. Louis District personnel have been permitted to enter the building and have observed damage that would be difficult and expensive, perhaps impossible, to repair. A repeatedly-flooded historic building on North Main Street deteriorated continuously after the 1973, 1979, 1982, and 1983 floods, and was finally demolished in 1985. A flood like the Urban Design Flood would certainly result in some (probably large) number of historic buildings being literally swept away. The ongoing deterioration associated with less severe floods is slow, but apparently just as final.

2. Project Scope.

a. In addition to the information in Sections 2.7 and 2.8 of the MAIN REPORT and Section 5 of APPENDIX E, the following is provided. It should be added to the discussion on page 87 of the MAIN REPORT and pages E-58 and E-59 of APPENDIX E.

b. Any attempt to provide flood protection selectively to historic structures is made impossible by the very history of Ste. Genevieve. French colonial town planning on the Mississippi River revolved around the "common field" concept, in which land holdings were narrow strips perpendicular to the river, and which resulted in residences being strung in linear fashion parallel to the river. Although Ste. Genevieve was moved away from the riverfront after 1785, the same residential pattern prevailed in the new location, as is evidenced today by the fact that the remaining French colonial homes are distributed widely at a distance from, but still parallel to, the river. This is especially evident along St. Mary's Road, where several French colonial homes line up at the west end of the Common Field. French colonial residences today are spread from the very north to the very south end of the city.

c. The French colonists established the settlement pattern; later settlers simply fit into it, and interspersed themselves between the widely-strung French buildings. The remaining architecture in Ste. Genevieve is thus an excellent material reflection of the town's mixed cultural history. The French houses of the late 1700s and early 1800s, the earliest American houses of the period 1805-1830, the German immigrants' buildings of the mid-to-late 1800s, the late 19th century Victorian and Queen Anne houses, and all the rest, are intermingled door-to-door in a historic district whose long axis parallels the Mississippi River. This interspersion of historical architecture is a primary contributor to the town's historic significance; it is the reason that the town must be considered as a unit, and is the reason that no subset of the historic district could be isolated for individual flood protection.

d. The integrated nature of architectural and historical patterns in Ste. Genevieve was recognized when the community was designated a National Historic Landmark in 1965. A National Landmark District was defined and its boundary is shown on the PLATE at the back of this addendum. The recommended plan would reduce flood damages for all the historic resources in the National Landmark District.

3. Historic Significance.

a. In addition to the information in Section 2.3.8.a. of the MAIN REPORT and Section 1.1.1 of APPENDIX E, the following is provided. It should be added to the discussions on page 18 of the MAIN REPORT, and page E-6 of APPENDIX E.

b. The national historic significance of Ste. Genevieve is Federally recognized by, and the threat of flooding to historic preservation in Ste. Genevieve is a Federal concern codified by, the Historic Sites Act of 1935 and the National Historic Preservation Act of 1966, and amended (P.L. 96-515, 16 U.S.C. 470). State, local, and international interests have expressed similar concerns for the historic importance of Ste. Genevieve.

c. Regulations guiding implementation of the National Historic Preservation Act set forth explicit criteria for the historic significance of National Historic Landmarks and of properties listed on the National Register of Historic Places. Ste. Genevieve belongs to both listings, and its historic significance can be described in general as follows, according to the applicable criteria.

(1) The community embodies the distinctive characteristics of several types, periods, and methods of construction.

(2) The community is a significant and distinguishable entity including components which possess individual distinction of an architectural and historical nature, and which are integral parts of the entire community's history and architectural heritage.

(3) The town has survived in its present location since 1785, and has retained fairly unspoiled visual and physiographic surroundings; it thus possesses integrity of location and integrity of setting.

(4) Ste. Genevieve's rural setting, its situation near the river, the interest of the town's inhabitants in its heritage, and visual aspects of its history impart its integrity of "feeling."

(5) Ste. Genevieve possesses integrity of design, workmanship, and materials. These qualities derive from the fact that structures in town represent periods of construction spanning over 200 years; that they represent several types of construction, including French Colonial, Federal, American Log, Early Frame, American Gothic, German, Homestead, American Eclectic, Victorian, Queen Anne, Bungalow, and American Foursquare; that within construction types various methods of construction occur, an example being French Colonial maisons de poteaux en terre, poteaux sur solle, pierre, etc.; and that many buildings, from the oldest to the most recent, remain with their original construction materials intact.

(6) Ste. Genevieve embodies a continuity of history and associated architecture. This quality, amplified the spatial intermingling of French, German, and American architecture, and of buildings of the 18th, 19th, and 20th centuries, imparts to Ste. Genevieve its integrity of association, and contributes to its national uniqueness as a Historic Landmark.

d. It has been said in the MAIN REPORT that Ste. Genevieve has the largest collection of French Colonial structures found in one place anywhere in North America. Elsewhere, French colonial architecture has been lost to floods, fires, and urban renewal. Even New Orleans has lost its French architecture; the famous French Quarter is merely a historical name. Only one French Colonial building remains in New Orleans. Due to a great fire in 1788, and to subsequent development, the Vieux Carre is comprised of 19th century American architecture. Ste. Genevieve's French Colonial buildings separate the town from all other historic sites on the continent.

e. However, Ste. Genevieve's historic significance is enhanced and increased by the intermingling of architecture from all periods of the town's history. The historical background of the architectural pattern has been provided in Section 2 above. To illustrate, the following is what one would pass if one were to start at the Louis Bolduc House on South Main Street, walk 1-1/2 blocks north to Merchant Street, then turn west and walk two blocks to the town square.

Builder's Name	Architectural Style	Date Built
Louis Bolduc	French Colonial	1770
Gemien Beauvais	French Colonial	1813
Rene Lemeilleur	French Colonial	1820
Joseph Amoreaux	Greek Revival	1844
Jean Bte. Valle	French Colonial	1785
A. Lagrave	Commercial Vernacular	1853
M. Ream	American I-house	1850
(Unknown)	American Four Square	1900
Vital St. Gemme Beauvais	French Colonial	1790
Augustine Menard	Italianate Commerical	1875
Firmin A Rozier	German Vernacular	1850
(Unknown)	Commercial Vernacular	1900
Joseph Bogy	Italianate	1870
Jesse B. Robbins	Italianate	1867
Jacob Phillipson	Federal	1818
Parfait Dufour	Commercial Vernacular	1818
Theophilus Dufour	American Vernacular	1837
Abraham Newfield	American I-house	1806
Emile Vogt	American T-plan	1880
(Unknown)	American Four Square	1811

Only the last four houses on the list would not be flooded by the Mississippi River Urban Design Flood. A similar mixture of historical architecture is accessible from virtually every street corner in the National Historic Landmark District.

4. Level of Protection.

a. In addition to the information in Section 2.8.2.b. of the MAIN REPORT and Section 3.1.2.e.(6) of APPENDIX A, the following is provided. It should be added to the discussions on page 96 of the MAIN REPORT and page A-39 in APPENDIX A.

b. The decision to select the Urban Design Flood (UDF) level of protection for levee measures that protect Ste. Genevieve from Mississippi River flooding was made at the end of the first planning iteration. Three levee heights were examined in the first iteration, but only Urban Design levees were designed in later iterations. Although EC 1105-2-130 (Guidance on Recommending Level of Protection For Urban Areas) was not in effect when the decision to select UDF protection was made, the process described in the EC was generally followed in making the decision.

c. Since none of the first iteration Mississippi River levee measures were close to being economically justified, there was no NED levee. The lowest level of protection examined was the stage of record (1973 flood), which is about a 30-year flood. This level was not selected because of the high probability that the levee would be overtopped, and because a 100-year flood would overtop the levee and flood about 25 percent of the community.

d. The decision to select a level of protection higher than the 100-year level was based on an analysis of risk reducing factors and on special conditions that apply in Ste. Genevieve. The following factors that reduce the risks associated with a 100-year levee were considered:

(1) The first iteration 100-year levees were designed not to fail until overtopped.

(2) If stage forecasts indicated that the 100-year levees would be overtopped, flood emergency authorities could control the location of the overtopping in order to reduce the hazard of high velocities and scouring that would result from an uncontrolled overtopping. The effectiveness of this factor would be diminished when the flood inundates the entire levee.

(3) Federal, state, and local flood emergency operations would result in evacuation and reduced risk of loss of life if the 100-year levees were overtopped.

e. Even with the risk reducing factors described above in place, there remain several special considerations in Ste. Genevieve that justify the higher Urban Design Flood level of protection:

(1) The Urban Design Flood is 8 feet higher than the flood of record, which was a devastating flood. The UDF would flood about 30 percent of the community, with many buildings subjected to very deep flooding.

(2) Flood durations are very long, and the town could remain inundated for weeks after the levee overtopped.

(3) The town's water supply wells, sewage treatment plant, water and sewer pumps, electric substations and telephone building would be flooded, disrupting essential public services.

(4) One of the town's major employers and numerous smaller employers would be flooded to great depths.

(5) A total of 210 nationally significant historic buildings would be flooded by the Urban Design Flood, about half the historic buildings in the community. All these buildings are proposed for inclusion on the National Landmark Inventory, and many of them are on the original National Landmark Inventory made in 1969. The uniqueness and national and international importance of these buildings and the community within the

boundary of the National Landmark District are described at length in this report. Many historic buildings would be completely lost because of the great depths, possible velocities, and long flood durations, and an irretrievable resource would be severely damaged. The 210 historic buildings that would be flooded by the Urban Design Flood include 42 (20 percent) that are higher than the 100-year flood level.

(6) A 100-year levee would encourage additional very costly restoration projects in the low-lying parts of Ste. Genevieve. It would also encourage history and tourist related businesses to locate in existing buildings in the floodplain. These activities would take place in the floodplain because this is where the historic resource opportunities are located. An Urban Design Flood would flood these with-100-year-project restored buildings to great depths.

(7) A 100-year levee would be lower than the Urban Design Flood protection provided for other urban areas along the Mississippi River in the St. Louis District.

(8) The first iteration levee most similar to the recommended plan is Measure 6 constructed with dredged material. The Measure 6 UDF levee would cost $3,500,000 (18 percent) more than the Measure 6 100-year levee, at October 1982 price levels. For an 18 percent increase in cost, 20 percent more historic buildings are protected, and the remaining lower-lying historic buildings would not be subjected to flooding between the 100-year and UDF levels.

f. In addition to the information in Section 2.8.3.b. of the MAIN REPORT and Section 3.1.3.f.(1) in APPENDIX A, the following is provided. It should be added to the discussions on page 99 of the MAIN REPORT and page A-48 in APPENDIX A.

g. The sizes of the tributary channel widening and levee measures, Measures 12 and 13, were determined based on the objective of providing the highest reasonable level of protection without detracting from the historic setting. In a field inspection by appropriate interdisciplinary team members, the impacts of various size channel enlargements and levees on the historic resource were considered. Gabion or riprap and grass channel linings were selected over concrete linings. The maximum channel size and appropriate channel configurations to avoid nearby historic buildings were selected. Low level levees were selected to minimize the visual impacts on the historic setting and for other design reasons, such as tying the levee along South Gabouri Creek into a railroad embankment that has the same crown elevation as the levee.

h. After this field trip, the with-project hydraulics were run, and the designs and cost estimates were prepared. The with-project flood profiles were compared to structure locations and elevations using the Urban Damage II economics model, and it was determined that Measures 12 and 13 provide about a 25-year level of protection, with a small amount of residual damages still occurring with a 25-year event.

i. The tributary measures reduce the levels of all flood frequency profiles, from the 2-year through the Standard Project Flood. The effects of these reductions are shown on the following table.

Flood Damage Reduction Resulting From Measures 12 and 13

	South Gabouri Creek	
	Without Measure 12	With Measure 12
Buildings Damaged		
25-year flood	32	10
100-year flood	45	28
500-year flood	70	41
Average Annual Damages	$ 72,000	$ 19,000 (74% reduction)

	North Gabouri Creek	
	Without Measure 13	With Measure 13
Buildings Damaged		
25-year flood	39	7
100-year flood	98	29
500-year flood	157	56
Average Annual Damages	$ 30,000	$ 4,700 (84% reduction)

j. It should be noted that the small levee along North Gabouri Creek in Measure 13 may no longer be needed because local interests have recently constructed a larger levee on this alinement, primarily to protect an area from Mississippi River flooding. The acceptability of the local levee would be determined in post-authorization studies.

5. Induced Damages.

a. In addition to the information provided on page C-71 in Section 11.2 of APPENDIX C and on PLATE C-26A, the following information is provided. It should be added to the discussions on page 126 in Section 3.3 and page 128 in Section 3.6 of the MAIN REPORT, on page C-71 in Section 11.2 of APPENDIX C, and on page H-89 in Section 4.4.1 of APPENDIX H.

b. The Plan 1 levee would have a minimal effect on flood heights on the Mississippi River. Induced flood heights at the Little Rock Landing gage (RM 125.5), just upstream from the north end of the levee, are shown for various flood frequencies on PLATE C-26A in VOLUME THREE. At the Little Rock Landing gage, the greatest induced height is associated with the 100-year Mississippi River flood, which would be raised about 0.5 feet by the project. Induced heights further upstream at the Brinkey's Landing gage (RM 136.0) are less than 0.3 feet.

9. Pump Size and Ponding Area Analysis.

a. The following information should be added to Section 3.3 on page 126 of the MAIN REPORT.

b. The alinement of the Mississippi River levee was determined based on the following considerations.

(1) The levee ties into high ground to the north and to the south of town so that the entire National Landmark District is protected.

(2) The levee is not located close to the community because this would result in adverse visual impacts on the historic resource and adverse impacts on archeological resources along St. Mary's Road.

(3) The undeveloped floodplain area was utilized for ponding in order to reduce the size of pump station required.

(4) The levee was set back from the Mississippi River bank so that the project would have a minimal effect in raising flood heights on the Mississippi River. The induced flood heights are shown on PLATE C-26A in VOLUME THREE.

(5) The levee does not encroach on the Mississippi River floodway as defined by the Flood Insurance Program.

(6) The levee does not intrude into the area protected by the Ste. Genevieve County Levee District No. 2 levee.

(7) The levee is located to the north and west of Valle Spring Branch so this tributary does not flow into the protected area and require additional pump capacity and larger gravity drains.

(8) The levee is not located closer to the community in the north part of the floodplain because of an airplane landing strip in this area.

c. After the levee alinement was determined, the pump station capacity was determined by detailed hydraulic studies described in APPENDIX C. The pump was designed to utilize the ponding opportunity and to control the level of ponding so that the risk of flooding in the urban part of the town due to ponding would be comparable to that in other similar Corps projects in the St. Louis District. The ponding stage-frequency relationship is shown on PLATE C-26 in VOLUME THREE.

d. A period of record analysis was conducted for the 1939 to 1982 period, and with the project in place ponded water would not have reached the urban area. As an example, see PLATE C-25C in VOLUME 3, which shows that during the flood of record between March and June 1973, the peak volume pumped by the 650 cfs pump station would have been 515 cfs and the interior ponding would only have reached elevation 375 feet, well below

elevation 382 feet, the point at which urban damage begins in Ste. Genevieve.

e. If the levee were located closer to town there would be a small decrease in levee costs and a large increase in pump station costs. To take the extreme example, if the levee was alined so that no ponding area was available, the pump station would probably be sized to pump between the 10-year and 25-year discharges from the tributary streams on the interior of the levee. The 10-year discharge is 6,300 cfs and the 25-year discharge is 7,900 cfs. A 6,300 cfs pump station would cost about $27,000,000 and an 7,900 cfs pump station would cost about $31,000,000.

f. The borrow areas for the impervious soil to be placed on the levee were located on the river side of the levee for the following reasons. Borrow on the outside of the levee is generally considered better for seepage control. This location would also facilitate the evolution of the borrow areas into wetlands, with resulting environmental benefits and finally, the land impacted by this borrow location would not have as much potential for agricultural use as land inside the levee.

g. An analysis of the advantage of locating borrow areas inside the levee to increase the ponding capacity was not accomplished in the feasibility study. Such a study should be considered during post-authorization design, after detailed soil boring information and archeological surveys have been obtained.

c. The effect that the induced flood heights would have on flood damages have not been precisely measured, but they are considered to be insignificant. The area that would be affected has bluffs along the Missouri side of the Mississippi River and the Prairie Du Rocher Federal levee along the Illinois side. The net levee grade of the Prairie Du Rocher levee was based on a design assumption that levees were also built on the west side of the river from Kaskaskia Island up to Ste. Genevieve. Therefore, the induced heights caused by the Plan 1 levee were already taken into account in the Prairie Du Rocher levee design.

d. On the Missouri side of the river, only a railroad line and a railroad repair shop is located in the narrow band of land between the bluffs and the riverbank. Trains and other equipment are commonly evacuated from these facilities when threatening river stages are predicted. Little induced damage is expected to accrue to the fixed railroad facilities.

6. City Historic Preservation Ordinance.

a. In addition to the information on page 76 in Section 2.5.2 of the MAIN REPORT, the following is provided. It should be added to the discussion on page 76 of the MAIN REPORT.

b. In 1978 the city of Ste. Genevieve enacted a "Historic Preservation Ordinance." In general, its purposes are to preserve the historic features and the aesthetic and cultural heritage in the historic parts of the community, and to allow for economic development compatible with the historic resource. The ordinance establishes a Landmarks and Urban Design Commission and a Landmarks Register. The Commission reviews any plans to alter the exterior or grounds of buildings on the Landmarks Register. It also reviews plans for the alteration of any building in specified areas, and plans for any new building that would be within sight of a building on the Landmarks Register.

c. The City is currently in the process of revising the Historic Preservation Ordinance with the intention of providing stricter design guidelines. This is being done as part of the process of revising the City's Comprehensive Plan, and will be accomplished whether or not a Federal flood protection project is authorized. In a letter to Division dated 7 March 1985, the City reaffirmed their intent to fulfill the requirements for non-Federal cooperation prior to project implementation, including the requirement to take actions to safeguard cultural resources.

7. Section 404 Evaluation.

a. A Section 404(b)(1) Evaluation was completed by the St. Louis District, and was forwarded to the BERH by the Lower Mississippi Valley Division. This Evaluation should be inserted into the report as APPENDIX K in VOLUME TWO. PLATE K-1, which shows the area of Section 404 jurisdiction, should be inserted as the last plate in VOLUME THREE.

8. Costs and Benefits.

a. In addition to the information presented on page 128 in Section 3.6 of the MAIN REPORT, the following updated information is provided.

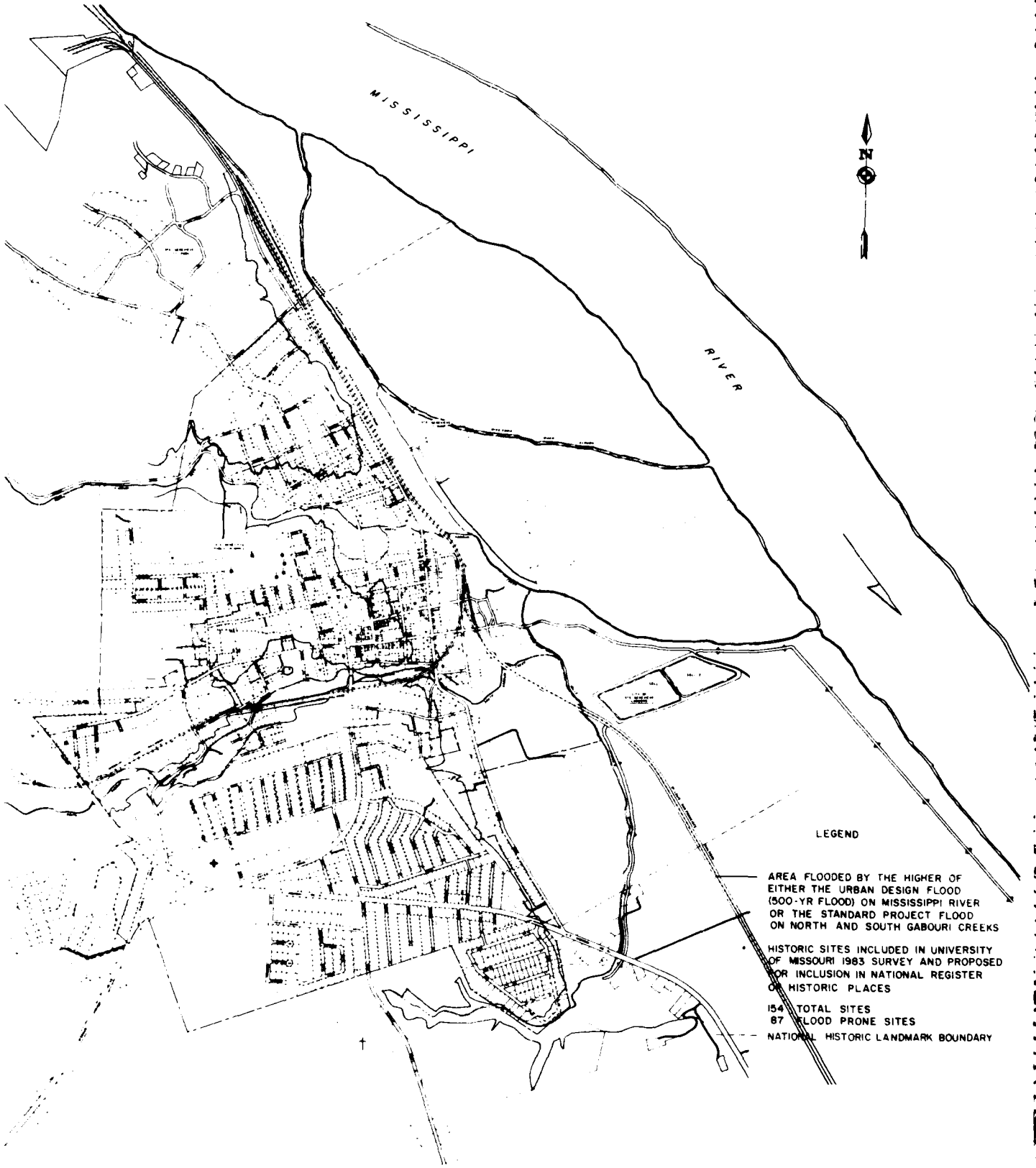
First Cost of Plan 1 (October 1984 Price Levels)

Federal (Agency/Purpose)	Traditional Financing/Cost-Sharing
Corps of Engineers/Flood Control	$30,945,000
Corps of Engineers/Recreation	$ 75,000
Total Federal	$31,020,000
Non-Federal	
State of Missouri	$ 0*
City of Ste. Genevieve	$ 1,280,000*
Levee District #3 of Ste. Genevieve County	$ 1,280,000*
Total Non-Federal	$ 2,560,000
Total Cost	$33,580,000

* This breakdown of the non-Federal cost is a Corps of Engineers preliminary estimate based on a State of Missouri letter that says its support does not imply a commitment of state funds, and on a joint letter of intent from the City of Ste. Genevieve and Levee District #3. The actual breakdown of non-Federal costs may be different.

Evaluation of Plan 1
(8-3/8% Discount Rate and 100 Year Project Economic Life)

Annual Benefits:	
Flood Control	$482,000
Recreation	48,000
Ecological	9,000
Total	$539,000
Annual Cost:	$3,473,000
B/C Ratio:	0.16



STE. GENEVIEVE, MISSOURI
HISTORIC STRUCTURES

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SCALE IN FEET

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 TUCKER BOULEVARD, NORTH
ST. LOUIS, MISSOURI 63101

REPLY TO
ATTENTION OF

STE. GENEVIEVE, MISSOURI
FEASIBILITY REPORT

FLOOD CONTROL STUDY
FOR HISTORIC STE. GENEVIEVE - 80061

VOLUME ONE

MAIN REPORT
FINAL ENVIRONMENTAL IMPACT STATEMENT
PUBLIC VIEWS AND RESPONSES

June 1984

U.S. Army Corps of Engineers
St. Louis District
Lower Mississippi Valley Division

SYLLABUS

This study addresses flooding and related problems and opportunities in Ste. Genevieve, Missouri. Ste. Genevieve is a unique historic town that was founded during the French Colonial period in the 1700's. A major part of the community has been designated a Registered National Historic Landmark and is listed on the National Register of Historic Places. Ste. Genevieve enjoys local, state, National, and international recognition as a historic resource, as attested to in the PUBLIC VIEWS AND RESPONSES section of this report.

The 20.8 square mile study area includes the entire town of Ste. Genevieve, the Mississippi River floodplain lying east of the town, and areas that drain into the community, including the watersheds of North Gabouri Creek, South Gabouri Creek and Valle Spring Branch. The historic area is flooded primarily by the Mississippi River, and to a lessor extent by North and South Gabouri Creeks. An ongoing University of Missouri research project in Ste. Genevieve had identified 87 historic buildings subject to flooding as of February 1983. In May 1984 the nearly completed project identified 230 historic buildings subject to flooding.

A full range of structural and nonstructural flood damage reduction measures were developed during the study and are documented in this report. Recreation measures were also developed. Several complete plans were developed that would give the entire town a high level of protection from Mississippi River flooding and a reasonable level of protection from tributary flooding, while complying with Federal law which discourages adverse effects on Registered National Historic Landmarks. An analysis of all substantial plans clearly shows that there is no economically feasible plan under National Economic Development criteria; therefore there is no Federal Action recommended by the Corps.

The plan which best satisfies the flood control and historic preservation objectives of the study and is most acceptable to potential project sponsors is presented in the report as Plan 1. It consists of an urban height levee that protects Ste. Genevieve from Mississippi River floods; an interior drainage system that includes a 650 cfs pump station; channel widening on North and South Gabouri Creeks; six bridge replacements, one bridge removal and two bridge modifications; two small levees along the tributaries; and recreation features provided on flood control project lands. The total first cost of Plan 1 at October 1982 price levels is $31,500,000. The City of Ste. Genevieve and Levee District #3 of Ste. Genevieve County provided a letter of intent to be the non-Federal co-sponsors for this plan. However, as previously stated, the Corps of Engineers is recommending no action.

Historic preservation in Ste. Genevieve appears to be in the Federal interest, and substantial flood protection similar to Plan 1 has been found to be a necessary part of any general effort to protect and enhance

the historic resource in the community. Other Federal and non-Federal agencies are encouraged to preserve the historic resource in Ste. Genevieve, and to provide flood protection for the community so that the expected continued deterioration of the historic resource due to flooding can be prevented.

The above finding was coordinated with the public through dissemination of a draft report dated March 1984 and through a public meeting held on 24 April 1984. Many appeals for either the Corps to change its finding or for special consideration to be given to Ste. Genevieve were received and are included in the PUBLIC VIEWS AND RESPONSES section of this report. Of special note are letters from the Consulat General de France, the Office of the Secretary of the Interior, the Advisory Council on Historic Preservation and the National Trust for Historic Preservation.

STE. GENEVIEVE, MISSOURI

FEASIBILITY REPORT

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- Public Views and Responses

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STE. GENEVIEVE, MISSOURI

FEASIBILITY REPORT

FLOOD CONTROL STUDY

FOR HISTORIC STE. GENEVIEVE - 80061

MAIN REPORT

STE. GENEVIEVE, MISSOURI

FEASIBILITY REPORT

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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 TUCKER BOULEVARD, NORTH
ST. LOUIS, MISSOURI 63101

REPLY TO ATTENTION OF

STE. GENEVIEVE, MISSOURI

June 1984

FEASIBILITY REPORT

MAIN REPORT

SECTION 1 - INTRODUCTION

1.1 STUDY AUTHORITY

The Ste. Genevieve, Missouri study is authorized by the following resolution introduced by Congressman Parke M. Banta of Missouri and adopted on 17 June 1948 by the Committee on Public Works of the United States House of Representatives:

> "Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors, be, and is hereby requested to review the reports on the Mississippi River between Coon Rapids Dam, Minnesota, and the mouth of the Ohio River, printed in House Document No. 669, 76th Congress, 3rd Session, with a view to determining whether any modifications of the recommendations contained therein are desirable at this time with respect to that reach of the Mississippi River lying between the mouth of the Ohio River and the mouth of the Missouri Riv r."

1.2 STUDY PURPOSE AND SCOPE

The purpose of this study is to determine the feasibility of flood damage reduction and related improvements at Ste. Genevieve, Missouri. Ste. Genevieve is a unique historic town that was founded during the

French Colonial period in the 1700's. Many structures built in that period are still standing, and are subject to flooding.

The study addresses flooding problems, recreation opportunities, and environmental concerns, especially as they relate to the historic structures and historic setting in Ste. Genevieve. The study area includes the town of Ste. Genevieve, the segment of Mississippi River floodplain to the east of Ste. Genevieve, and the watersheds of the streams that drain into the town, North Gabouri Creek, South Gabouri Creek, and Valle Spring Branch (see PLATE 1). The Ste. Genevieve study is an interim response to the Banta resolution.

1.3 PRIOR STUDIES AND REPORTS

The prior studies and reports pertinent to this study are listed below.

a. A preliminary examination report entitled Interim Report No. 1 - Flood Protection, Ste. Genevieve, Missouri was prepared by the St. Louis District, Corps of Engineers in January 1950. The report recommended that "a detailed survey be made with a view to determining the most feasible plan of improvement to alleviate the existing flood problem in the town of Ste. Genevieve, Missouri." Additional studies were not funded until fiscal year 1974, after the town suffered major damages from the April 1973 Mississippi River flood.

b. The Corps of Engineers study initiated in fiscal year 1974 resulted in a report entitled Ste. Genevieve, Missouri Survey Report dated March 1980. This report addressed flood problems in historic Ste. Genevieve and the feasibility of Federal participation in a flood protection plan for the community through the Corps of Engineers program. The Board of Engineers for Rivers and Harbors (BERH) reviewed the report in July 1980 and required additional hydraulic, economic, and plan formulation information and a report on the environmental effects of the plans considered.

c. A Floodplain Information Report dated September 1974, was prepared for Ste. Genevieve by the St. Louis District, Corps of Engineers. The St. Louis District also prepared a Flood Insurance Study for Ste. Genevieve for the Federal Insurance Administration in August 1975.

d. The agricultural lands in the Mississippi River floodplain immediately east and southeast of Ste. Genevieve are known as the Common Big Field - Ste. Genevieve - Cottonwoods area (see PLATE 2). The Flood Control Act of 1936 authorized levee protection for 1200 acres in this area and the Flood Control Act of 1944 authorized protection of an additional 2000 acres. These agricultural areas lie south of Gabouri Creek and do not include the town of Ste. Genevieve. No construction was undertaken under these authorities because local interests did not provide the required items of local cooperation.

e. Flood protection for this agricultural area was addressed again by House Document No. 519, dated August 1962 and entitled Mississippi River Between Ste. Genevieve and St. Marys, Missouri. This Corps of Engineers study examined the feasibility of combining flood protection for the Common Big Field - Ste. Genevieve - Cottonwoods agricultural area with protection of Kaskaskia Island to the south. It did not address flood protection for the town of Ste. Genevieve. The study found a lack of local interest in a project for the Common Big Field - Ste. Genevieve - Cottonwoods area and recommended that no additional flood protection for this agricultural area be authorized. Flood protection for the area was deauthorized on 6 November 1977 under the provisions of Section 12 of Public Law 93-251, the Water Resources Development Act of 1974, as amended.

1.4 EXISTING WATER PROJECTS

Existing Federal water projects in the vicinity of Ste. Genevieve include the Prairie du Rocher levee in Illinois, across the Mississippi River from Ste. Genevieve, the Kaskaskia Island levee southeast of Ste. Genevieve, and the Perry County Levee District levee further south (see PLATE 2). A brief discussion of these three existing water projects follows.

a. The Prairie du Rocher levee was authorized by the Flood Control Act of 1946. It is located in Randolph County, Illinois, on the left

bank of the Mississippi River between river miles 118 and 130 above the Ohio River. The levee project is designed to protect against a 50-year recurrence interval flood and has 2 feet of freeboard.

b. The Kaskaskia Island levee was authorized by the Flood Control Act of 1938. It is located in Randolph County, Illinois, on the right bank of the Mississippi River between river miles 111 and 116 above the Ohio River. The project was constructed to protect against a stage of 38.5 feet on the Chester, Illinois gage. The Flood Control Act of 1962 authorizes the reconstruction of the existing levee to protect against a flood stage of 46.6 feet on the Chester, Illinois gage. This is approximately a 50-year recurrence interval flood level. The new levee will have a minimum of 2 feet of freeboard above this level. Construction has been initiated on gravity drains, and construction to raise the levee is anticipated to begin in the summer of 1984.

c. The Perry County levee was authorized by the Flood Control Act of 1936. It is located in Perry County, Missouri and Randolph County, Illinois, on the right bank of the Mississippi River between river miles 94 and 111 above the Ohio River. The levee project is designed to protect against a 50-year recurrence interval flood and has 2 feet of freeboard.

Viewed in isolation, the existence of Prairie du Rocher, Kaskaskia Island, Perry County, and other Federal levees along the middle

Mississippi River could raise flood levels in the town of Ste. Genevieve under certain conditions. The effects the levees have on flood heights, however, vary depending upon the characteristics of each specific flood event. It should be noted that, with the exception of Prairie du Rocher, these Federal levees were constructed in areas where significant non-Federal levee protection existed previously.

Furthermore, Federal flood control reservoirs on tributaries of the Mississippi River upstream from Ste. Genevieve are able to reduce flood heights in some circumstances, and may completely or partially offset the increase in flood heights caused by the levees, depending upon the characteristics and distribution of each flood.

1.5 THIS REPORT

The Ste. Genevieve, Missouri Feasibility Report was prepared by the St. Louis District, Corps of Engineers. It is a revision of a Survey Report prepared in March 1980, which was reviewed by the Board of Engineers for Rivers and Harbors in July 1980. The Board voted to return the report to the District for additional study and revision. It recognized the importance of preserving unique cultural resources, such as the historic structures in Ste. Genevieve, and commended the reporting officers for their efforts. The Board also recognized that while projects of this nature may not be justified on the basis of traditional economic benefit-cost criteria, there are certain non-economic benefits associated with preservation or enhancement of resources that may fully

justify some projects. The Board asked that additional basic information be presented in the report, particularly in the areas of hydraulics, economics, plan formulation, and the environmental effects of plans.

A draft Feasibility Report dated March 1984 was reviewed by the public and other agencies, and comments received were taken into consideration during the preparation of this final Feasibility Report. This Feasibility Report will be reviewed by the Corps' Lower Mississippi Valley Division office and will then be sent to the Board of Engineers for Rivers and Harbors as a replacement for the March 1980 Survey Report. The final report will also be reviewed by the Office of the Chief of Engineers, the Office of the Secretary of the Army, the Office of Management and Budget, and other interested Federal, state and local officials. Then it will probably be provided to the Congress for its consideration regarding what actions, if any, should be taken by the Federal Government. If Congress should decide to authorize a Corps of Engineers project, funds must then be included in the Federal budget to provide for post-authorization studies, the preparation of plans and specifications, and ultimately, construction of any Congressionally authorized plan of improvements.

This Feasibility Report includes three volumes. This volume, volume one, includes the main report, the draft environmental impact statement, and public views on the study. Volume two includes appendices that provide more detail and related background which supports the information

in volume one. Volume three includes plates that show drawings, maps, and charts for the appendices. More specialized study documentation such as computer output and technical economic, engineering, and environmental data is available for inspection at the St. Louis District, Corps of Engineers, Urban Studies Branch, 210 Tucker Boulevard North, St. Louis, Missouri.

SECTION 2 - PLAN FORMULATION

This section of the report summarizes the effort to define water related problems and opportunities in Ste. Genevieve and to develop and evaluate plans that alleviate the problems and take advantage of the opportunities. Additional detail can be found in APPENDIX A - PLAN FORMULATION.

2.1 PLANNING PROCESS

The planning process used in the Ste. Genevieve study included the following steps: specification of problems and opportunities; development of relevant information through inventories, forecasts, and analyses; formulation of alternative plans; evaluation of the effects of the plans; comparison of the alternative plans; and selection of a recommended plan. The study involved several iterations of these steps in order to improve basic information or to refine alternative plans. Public participation was an essential part of the planning process and was used in each step of the study.

Information was assembled on existing and future conditions that relate to the flooding problem in Ste. Genevieve. Specific problems and opportunities were defined, and planning objectives were set forth to guide the study effort. Each of these items are discussed in the sections that follow.

A first iteration study was conducted after receipt of the Board of Engineers for Rivers and Harbors comments on the March 1980 Ste. Genevieve, Missouri Survey Report. Flood damage reduction and related measures were developed and evaluated by the Corps of Engineers and then presented to non-Federal interests. Flood damage reduction measures are independent structural or non-structural projects that are effective in protecting certain areas from a certain degree of flooding. Additional measures were developed in a second iteration. These measures were also evaluated and discussed with the public. Appropriate measures were then combined to form plans, and the plans were evaluated and discussed with non-Federal interests.

2.2 FEDERAL OBJECTIVE

The Ste. Genevieve study was guided by the following Federal objective described in the Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies.

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

2.3 EXISTING CONDITIONS IN THE STUDY AREA

2.3.1 Location and Size.

The study area is located in Ste. Genevieve County in southeastern Missouri about 54 miles south of St. Louis. Ste. Genevieve is at the edge of the Mississippi River floodplain, on the right bank of the river between river miles 122 and 125 above the Ohio River. The study area includes the entire town of Ste. Genevieve, the Mississippi River floodplain lying east of the town, and areas that drain into the community, including the watersheds of North Gabouri Creek, South Gabouri Creek, and Valle Spring Branch (see PLATE 1). The 20.8 square mile study area includes 2.3 square miles of Mississippi River floodplain, 7.4 square miles in the North Gabouri Creek watershed above the

Missouri-Illinois Railroad, 6.2 square miles in the South Gabouri Creek watershed above the Missouri-Illinois Railroad, 3.4 square miles in the Valle Spring Branch watershed above U.S. Highway 61, and about 1.5 square miles of small areas that drain into the floodplain. The Mississippi River floodplain in the vicinity of Ste. Genevieve is shown on PLATE 2.

2.3.2 Climate.

The climate in Ste. Genevieve is temperate and humid and is similar to the climate in St. Louis. The mean annual temperature in St. Louis is 56° F, and the average annual precipitation is 35.4 inches.

2.3.3 Geology and Topography.

The study area lies within the Salem Plateau section of the Ozark Plateau Province, on the east flank of the Ozark Uplift and east of the St. Francois Mountains. The eastern portion of the study area lies within the Mississippi River floodplain.

The topography of the area varies from flat-lying floodplain near the Mississippi River to gently rolling to rugged hills in the western uplands. Elevations range from 360 feet NGVD where Gabouri Creek meets the Mississippi River to 900 feet NGVD on the North Gabouri Creek watershed divide in the northwest part of the study area.

Areas to the north, south, and west of Ste. Genevieve exhibit karst features such as sinkholes, joint cavities, caves, karst ponds, loosing streams, swallow holes and springs. These solution features have formed in the Salem, St. Louis, and Ste. Genevieve formations which underlie these areas.

The bedrock underlying the study area is composed of Ordovician and Mississippian sedimentary rocks, principally limestones and occasional shales and sandstones.

The study area is located in the Ozark Random Source seismotectonic zone. This is a region of moderate seismicity (earthquake activity).

2.3.4 Soils.

Soil surveys have recently been prepared for Ste. Genevieve County by the U.S. Department of Agriculture - Soil Conservation Service. The surveys have not been published, but data was provided to the Corps of Engineers. Engineering interpretations for each soil unit encountered are included in the soil surveys.

The predominant soil units in the study area represent deep, moderately well drained soils with generally low strengths. The primary usage of these units is the production of crops, pasture, and wildlife habitat. Most soil units within the project limits have moderate to

severe limitations when used for construction and urban development unless the soils are modified by such measures as compaction and drying.

A Corps of Engineers study of the project area revealed that enough suitable material is available for embankment construction and other engineering uses.

Most of the soils in the study area do not qualify as prime farmland due to topography, soil type, or frequency of flooding (flooded by 2-year flood).

2.3.5 Population.

Population statistics for Ste. Genevieve County indicate that the county's population has grown at an average rate of 5.1 percent per census period since 1900. The actual rate for each census period had not exceeded 8.0 percent until the most recent census period, 1970-1980, when a rate 18.0 percent was evidenced. Total population for Ste. Genevieve County in 1980 was 15,180.

The City of Ste. Genevieve, which is the largest in the county, had an average growth rate of 13.7 percent per census period since 1900. The actual rate for each census period had not been lower than 4.0 percent until the two most recent census periods, 1960-1970 and 1970-1980, when rates of 0.6 and 0.3 percent respectively were evidenced. Total population for the City of Ste. Genevieve in 1980 was 4,727.

The county's racial makeup is primarily white (99.4 percent), with the balance (0.6 percent) being composed of blacks, American Indians, Chinese, Phillipinos, Koreans, Asian Indians, and others. Family households are the primary living arrangements, with 91.9 percent of the county population.

2.3.6 Economy.

The economy of Ste. Genevieve County is comprised of five primary areas of employment: manufacturing, professional services, retail trade, agriculture, and construction. These areas in 1980 employed 34.2, 16.0, 13.9, 11.4, and 8.0 percent of the county's employed persons 16 years of age and over, respectively. The remaining 16.5 percent are employed in the areas of communications and public utilities, wholesale trade, finance/insurance and real estate, business and repair services, personal/entertainment and recreation services, and public administration. Tourism resulting from the historic nature of Ste. Genevieve is an important part of the economy of the community and influences several areas of employment. The unemployment rate for Ste. Genevieve County in February 1983 was approximately 12.7 percent.

The median family income in Ste. Genevieve County for 1979 was $18,693. Approximately 12.0 percent of the families had incomes of less than $7,500 while almost 5.4 percent had incomes of $40,000 or more. Families making less than the poverty level totalled 7.7 percent of all families.

2.3.7 Land Use.

Detailed land use data for the City of Ste. Genevieve and the area approximately one and one-half miles beyond the city limits is presented in the 1978 Sainte Genevieve, Missouri Comprehensive Plan. This data is based on a land use survey conducted by the Southeast Missouri Regional Planning and Economic Development Commission in 1976 and 1977.

No additional land has been annexed by Ste. Genevieve since 1976 and there has been very little change in the land use within the city. The land use information in the 1978 Comprehensive Plan is therefore considered current and is presented in TABLE 1.

2.3.8 Cultural Resources.

The cultural resources in the study area include both historical resources.

a. Historical Resources.

As a locality and as a community, Ste. Genevieve itself is a historical resource. The community harbors a nationally and internationally significant record of history and architecture. Its many old residences, its archives and traditions, and its historical continuity make Ste. Genevieve a living memorial to the settlement of America; its beginnings, its multi-ethnic character, and its perserverance.

TABLE 1

LAND USE
CITY OF STE. GENEVIEVE

Land Use Category	Acres in Use	Percent of Developed Area	Percent of Total Area
Residential	491.6	57.6	37.1
Commercial	84.8	10.0	6.4
Industrial	43.1	5.0	3.3
Parks & Recreation [1]	4.4	0.5	0.3
Public & Semi-Public	62.1	7.3	4.7
Streets, Alleys, & Railroads [2]	167.7	19.6	12.7
Total Developed area	853.7	100.0	64.5
Undeveloped Area	470.2	--	35.5
Total Area	1,323.9	--	100.0

[1] Excludes Pere Marquette Park (48.9 acres) which is outside of City limits. If Pere Marquette Park is considered as "available" for use and added to the 4.4 acres in the City, the total 53.3 acres would equal 6.3% of the City's developed area and 4.0% of the total area.

[2] Includes dedicated streets and alleys not in actual use.

First settled more than 230 years ago by French colonists, Ste. Genevieve is the oldest permanent European community in Missouri. The earliest firm documentation of the settlement is a census taken in 1752, although some (not necessarily incorrect) estimates place the founding of Ste. Genevieve as early as 1723. After its inception, through the American Revolution, and into the 1790's, Ste. Genevieve's culture was thoroughly French. All the while the American frontier pushed westward, and the first Anglo-American immigration to Ste. Genevieve came about 1796. In the 1830's, German immigrants came to Ste. Genevieve, and for the next century and a half, the town increased gradually in size as more American settlers arrived and as Ste. Genevieve families grew.

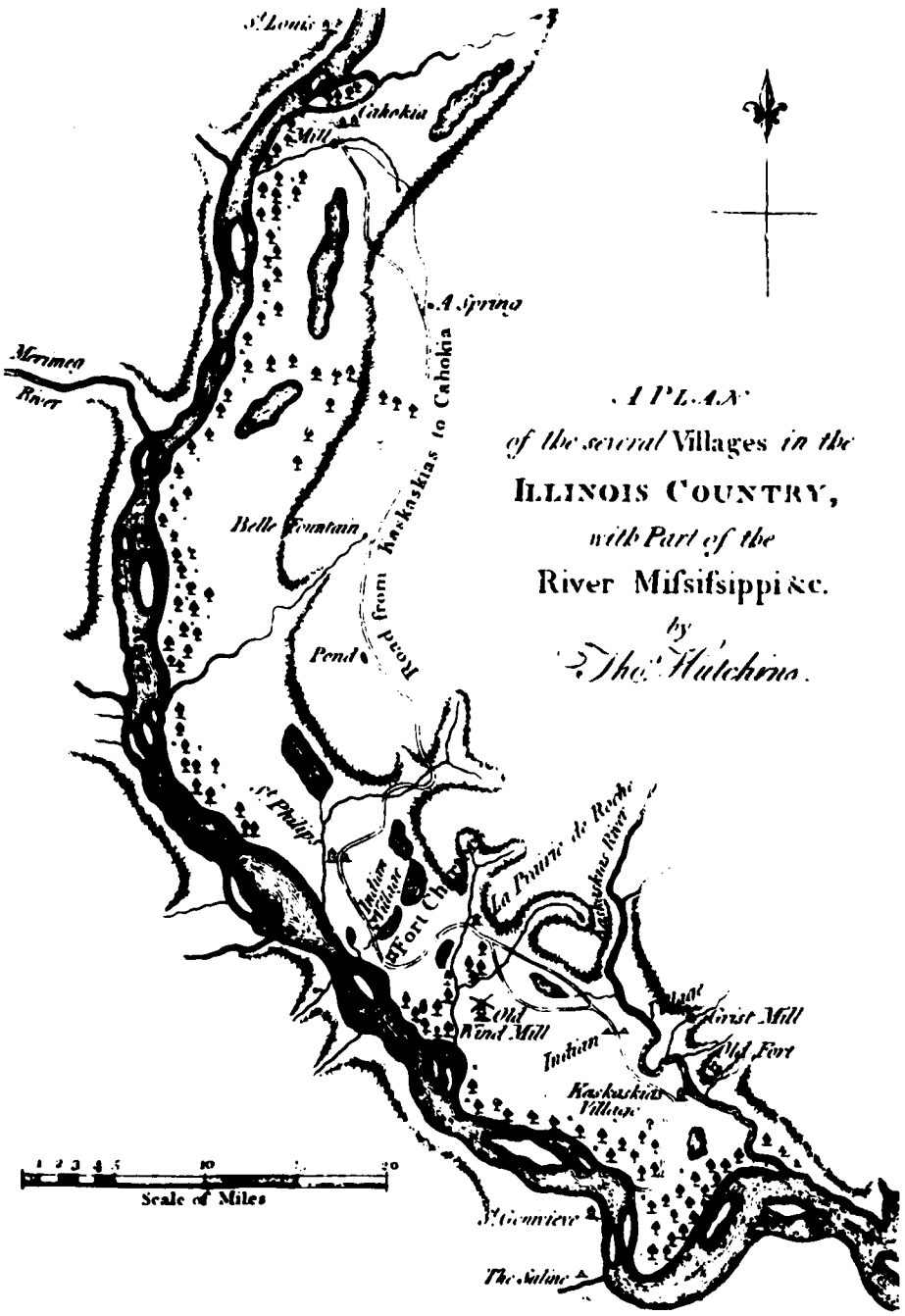
Early Ste. Genevieve was a community of diverse interests. It was an administrative post for the giant French colony of Louisiana, and an agricultural community whose farmers tilled the rich soils of Le Grand Champ, or Big Field. Also, many early inhabitants of Ste. Genevieve operated small-scale lead mining claims at the headwaters of the Big River. The Mississippi River was important to early Ste. Genevieve, and has played an important role in the town's history. During the mid-1700s, Ste. Genevieve underwent development as a regional trading center, and a river post from which lead and salt were shipped. So that its merchants could engage in river traffic, Ste. Genevieve was originally built southeast of its present location, near the river in the Big Field. Then in the 1770s and 1780s a number of river floods occurred, culminating in 1785, "l'annee des grandes eaux," a flood season

so severe that the town was completely inundated under several feet of water. The townspeople were discouraged--their townsite was clearly uninhabitable--but they were not defeated. When the flood receeded, the Frenchmen began salvage work, to the extent of moving entire houses to a new location, away from the river on higher ground between the North and South Gabouri creeks.

Ste. Genevieve stands there today, nearly two centuries later, and because some residences were moved from the Old Town, they are older than the present townsite itself. As all residents of modern-day Ste. Genevieve are aware, the new location still gets flooded.

But the move did perpetuate the town's existence, and helped to ensure Ste. Genevieve's unique and significant architectural heritage. Architectural styles observable in Ste. Genevieve today are associated with a variety of time periods and nationalities. The English influence is seen in homes of the American Gothic (popular from 1820 to 1900) and Bungalow (1895-1930) architectural styles; the styles called Homestead (1850-1920), American Eclectic (1860-1900), and American Foursquare (1900-1920) all originated in the United States. Some styles, like the Federal (1775-1820), American Log (late 1700s-late 1800s), and Early Frame (1830-1900) architectural styles combine elements of various national origin. Ste. Genevieve's German immigrants brought their own architectural traditions that are still to be seen on about a dozen buildings in town.

All of these add continuity and historical context to Ste. Genevieve's very old French Colonial residences, by far her most unique and interesting architectural aspect. The French Colonial architectural style seen in Ste. Genevieve is a style particular to the "Illinois Country" (The French colonists' term for the middle Mississippi Valley and surrounding territory - see following page). It results from the fact that Ste. Genevieve's French people arrived there from either of two geographic extremes: French Canada (Quebec) to the north, Louisiana and the Caribbean to the south. Architectural elements originating in the French countryside were modified in the new World to meet specific environmental needs, which differed between Canada and the Carribean. Common to all areas were the hip or pavillon roof, the Norman roof truss (see pages following), and walls of vertical squared posts that were either set into the ground (poteaux-en-terre, "posts in the ground") or on a rock sill (poteaux-sur-sole, literally, "posts on a foundation plate"). In Canada, the wet climate called for a very steep thatched or shingled roof that would effectively shed water. In the Caribbean, the hot climate required a covered porch (galerie) to shade the house walls and to provide an open, shady, cool place for working, relaxing, and sleeping. In Ste. Genevieve, midway between Canada and Lower Louisiana, the two styles were merged to produce the Missouri French architectural style--a double pitch roof, steep on top in the Canadian style and more gently pitched partway down to accommodate the galerie of Louisiana style.



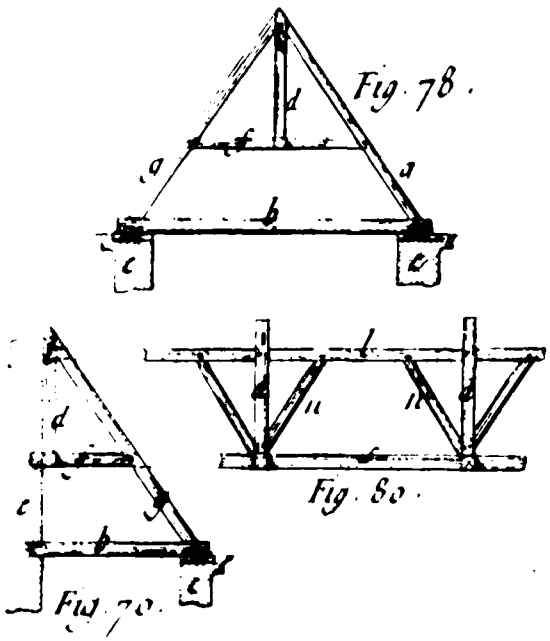
"A Plan of the several Villages in the Illinois Country, with Part of the River Mississippi &x." 1771, (published in 1778). The "Indian Village" northwest of "Kaskaskias Village" is that of the Kaskaskia Indians.

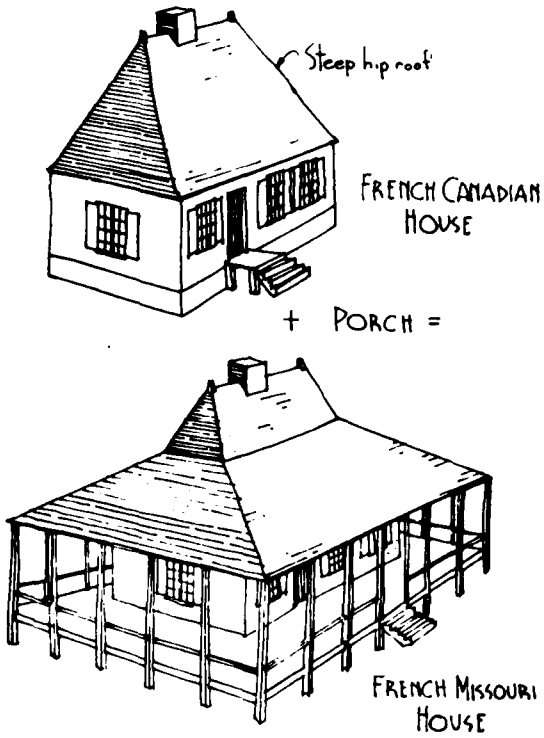
Hutchins Map (Circa 1771). Thomas Hutchins, an English Military Officer and cartographer, published this map of the Illinois Country in 1778. Notice that "St. Genivieve" is the Old Town site on the bank of the Mississippi River.

These photographs show 18th century Norman roof trusses at the Bolduc house (top) and Amoreaux house (bottom), both in Ste. Genevieve. The logs are hand-hewn and fastened with wooden pegs, not nails. The corrugated tin roofs are recent. Orginally, they would have been wood shingles.

Photographs courtesy of Charles E. Peterson

These sketches show the Norman roof truss (top) and the components of the Missouri French Colonial architectural style. Photographs courtesy of Charles E. Peterson.





The Pierre Bolduc house, built at Old Town Ste. Genevieve about 1770, and moved to the present townsite after the Great Flood of 1785. It was completely restored during the 1950's.

This rear view of the Pierre Bolduc house shows several attributes of the Missouri French colonial style--the upright wall posts, galerie, and double-pitched hip roof.

Nearly 50 French Colonial buildings stand in Ste. Genevieve today, of which 35 were built before 1803. These comprise the greatest concentration of French Colonial residences existing anywhere in the United States. They are enjoyed by students of historical architecture and by the general public. Indoor tours are offered at several of the original French Colonial homes. Also, because the Missouri French style represents an amalgamation of the Canadian French and Louisiana French, Ste. Genevieve's historic homes are in interest to students of these architectural styles as well.

Besides an architectural resource unequalled elsewhere in the United States, there exists for Ste. Genevieve a significant documentary record, much of it very old and handwritten in French. The town's value to scholars of the French colonial period has been recognized by the National Endowment for the Humanities, under whose sponsorship scholars from the University of Missouri are currently studying the historical documents, architecture, and social characteristics of the entire town as it grew and developed. They believe that Ste. Genevieve is the single best community for detailed analysis of the French experience in the Middle Mississippi Valley.

It is instructive to place that experience in its historical context. In 1673, the French explorers Marquette and Joliet traveled past the future site of Ste. Genevieve and were the first Euro-Americans to see this stretch of the Mississippi River. The French settlement of

Cahokia, Illinois, was founded in 1699. It is the oldest town on the river. In 1703, the French settled at Kaskaskia, Illinois, and sometime around 1750, Ste. Genevieve began. The French laid claim to a vast colony, called Louisiana, that spread from the Mississippi River all the way to the Rocky Mountains.

In 1762, France negotiated a secret treaty with Spain. Afraid of losing Louisiana to the English, who were defeating France in war, the French ceded the vast Louisiana territory to Spain. The treaty had little effect on Ste. Genevieve--the town's French commandant kept his post under the new government, and Ste. Genevieve's culture remained thoroughly French.

In 1763, the Treaty of Paris was signed, ending the Seven Years War (in America, called the French and Indian War), and Illinois became a British possession. The French living in Kaskaskia so disliked the idea of being British subjects that they demolished their own fort to avoid seeing it occupied by British troops. In 1764, St. Louis was founded by French colonists, and it has since thrived and become the principal city of the middle Mississippi River.

In 1778, George Rogers Clark fearlessly commanded a small American force and brought the Revolutionary War practically within sight of Ste. Genevieve when he liberated Kaskaskia, the town that would eventually become the first American capital of the Illinois territory.

The Revolutionary War was won, and Ste. Genevieve sat quietly as a French colonial outpost (on Spanish soil) across the Mississippi River from the new United States of America. Then in 1801, Spain and France once again conducted secret negotiations, and the Louisiana Territory belonged to France once more. Finally, the huge territory was sold to the United States on April 30, 1803. Official transfer of the territory did not occur on that day, but nearly a year later. On April 10, 1804, the Stars and Stripes flew over Ste. Genevieve, Louisiana Territory, United States of America.

For several decades under the new flag, Ste. Genevieve remained culturally French, just as it had during the Spanish dominion. Yet the town did not destroy its fort, or make any other symbolic gesture such as Kaskaskians had under the Union Jack. Why?

While it would be historically incorrect to state flatly that France and the United States have always had a harmonious coexistence as world powers, the two nations have nevertheless had some strong affinities, even valiant alliances. Perhaps most significant was the North American frontier experience itself. Confronted with a vast uncharted wilderness, French and American frontiersman seem first to have been concerned to explore it, to learn and subsist within it, and only then to settle and subdue it. The intrepid, individualistic people of the buckskin clothes and coonskin caps, if they were French, were called coureurs de bois and voyageurs; if American, they were frontiersmen, woodsmen, and trailblazers.

France and the United States struck their first alliance during the American Revolution, in February, 1778. The Stars and Stripes were saluted for the first time in European waters at Quiberon, France, during that same month. As all Americans know, the Statue of Liberty was a gift from France commemorating our fight for independence. During France's own revolution, Lafayette consulted Thomas Jefferson in the preparation of the French Declaration of the Rights of Man and of the Citizen (1789).

Three-quarters of a century later, public emotion in France ran so high after President Abraham Lincoln's asassination that, from funds donated by individual French citizens, a commemorative medal in gold was minted and presented to the President's widow. So that the whole French citizenry could participate as an entire nation, no one person was allowed to donate more than two cents. The medal's inscription (translated from French) reads, "Dedicated by French Democracy to Lincoln, President, twice elected, of the United States--Lincoln, honest man, who abolished slavery, re-established the Union, saved the Republic, without veiling the statue of liberty." Our continuing common interests in freedom and liberty, as reflected in the alliances of the United States with France during this century's two World Wars, are of course familiar history.

This discussion is an attempt to bring into focus a quality of Ste. Genevieve that is very real to those who have visited the town, but is yet to be realized by any who have not; it is a quality difficult to put on paper, and cannot be shown in a photograph. One can describe the town's architecture, enumerate its historic buildings, and show them in photographs. We have done so in this report. What is more difficult to convey is the intangible quality, the feeling imparted to one who can visit and experience the place. Certainly the town's ambience, its intangible but very attractive character, all relate to the town's rural setting, its proximity to the river, the rich farmland and scenic hills that surround it. Certainly one appreciates the town because it is old. But it also seems relevant, to the feelings aroused in an American visitor, that Ste. Genevieve's colonial heritage is French.

Ste. Genevieve's significant historical and architectural heritage has won national recognition. Part of the community is a Registered National Historic Landmark, and is listed on the National Register of Historic Places, the nation's official list of historically significant properties worthy of preservation. Nationally recognized historians, architects, and local residents alike are all enthusiastic about Ste. Genevieve's heritage and its potential for further study. Vast historical documentation, much of it handwritten in French, has just begun to be tapped, and the knowledge and documentation gathered by Ste. Genevieve's citizens hold great promise for scholars of history and architecture. The town's long occupation, its architectural survivals,

and its historical archives together contribute to an extensive and detailed historical record potentially surpassing that of the more thoroughly studied eastern seaboard colonies. The architectural and historic significance of Ste. Genevieve cannot be overstated.

The original National Landmark inventory included 79 historic buildings. This list is presently being updated by scholars from the University of Missouri, under the auspices of the National Endowment for the Humanities and the Missouri Heritage Trust. As of February 1983 the list had been expanded to include 154 buildings, of which 87 are subject to flooding. The information on the flood threat to historic buildings presented in Section 2.5.1.b. of this report is based on the February 1983 list. PLATE 3 shows the locations of the 154 historic buildings.

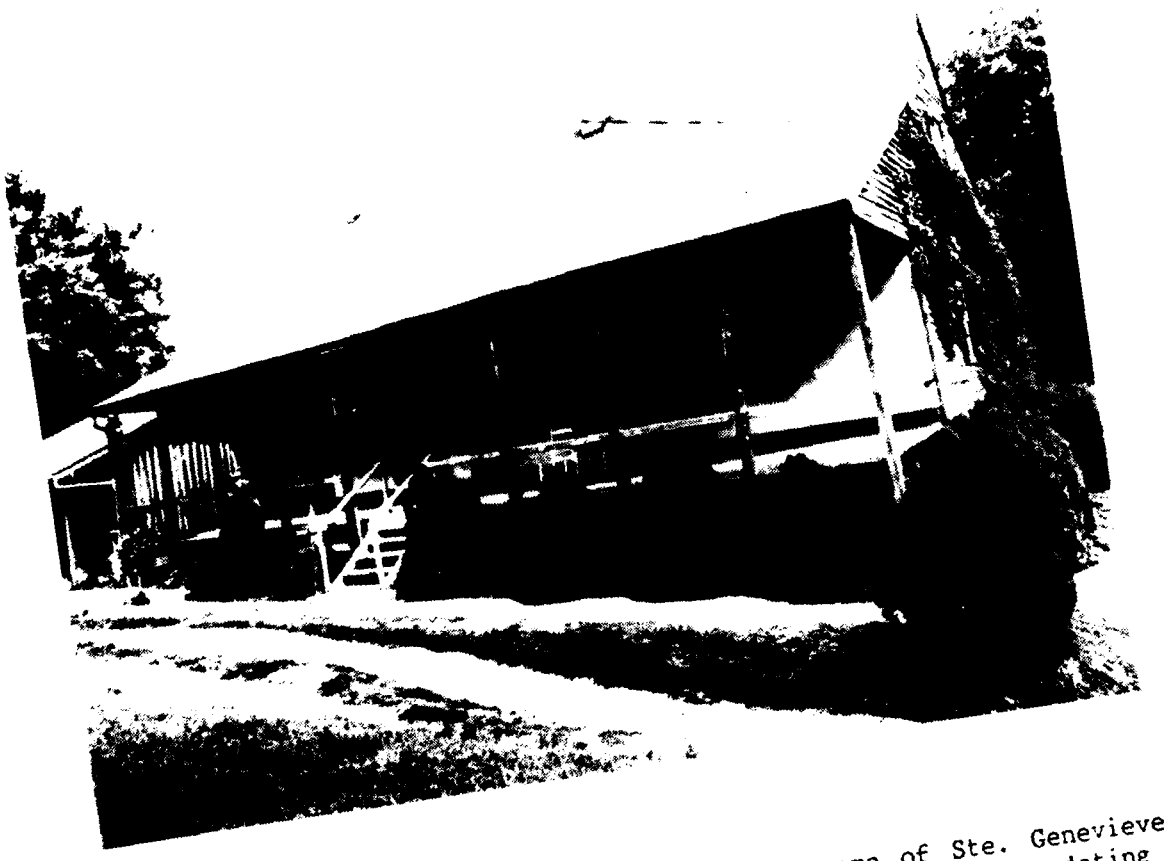
The University of Missouri inventory is still underway and will ultimately include representatives of all periods of architecture and history at Ste. Genevieve. A May 1984 letter from the University states that over 400 buildings, of which more than 230 are subject to flooding, will be recommended for inclusion in the National Landmark inventory ("preservation").

The St. Louis District has inventoried all the floodprone buildings in Ste. Genevieve. Buildings were located on photograph-based 1:2400 scale 2-foot contour maps, building identificaton numbers were assigned,

information was gathered on historic significance, first floor elevations were surveyed, etc. This information has been computerized via the District's Urban Damage II program, which is tied to hydraulic computer models of flooding on the Mississippi River and North and South Gabouri Creeks. This map and computer based inventory has enabled the District to define, in detail, the potential levels of flood water above or below the first floor of any building in Ste. Genevieve, including any building considered to have historic significance. (Because this inventory had to be finalized for release of the draft feasibility report, it does not reflect the most recent communication from the University of Missouri study team. The remainder of this report utilizes the February 1983 inventory, but it should be kept in mind that the number of floodprone buildings considered historically significant has increased since that time.)

1984	
1945	World War II
1939	
1918	World War I
1914	
1865	President Lincoln Assassinated
1830	German Immigrants Begin Arriving in Ste. Genevieve
1804	U.S.A. Purchases Louisiana Territory
1801	Spain Cedes Louisiana Territory Back to France
1796	Anglo-American Immigrants Begin Arriving in Ste. Genevieve
1785	L'Annee des Grandes Eaux
1778	France and the U.S.A. Sign Treaty of Alliance
1764	St. Louis Founded
1762	France Cedes Louisiana Territory to Spain
1748-1752	STE. GENEVIEVE FOUNDED
1703	Kaskaskia, Illinois Founded
1699	Cahokia, Illinois Founded
1673	Marquette and Joliet Explore the Middle Mississippi River

This time line shows, to scale, the temporal relationships of the events described on the preceding pages.



This photo, and the several that follow, show some of Ste. Genevieve's French colonial residences. Here shown is the Amoreaux house, dating to *circa* 1770.

The Janis house, circa 1790. Later the Greentree Tavern.

The Josiah Millard house, circa 1803-1810. It is built of cut limestone, a rarity among French colonial residences.

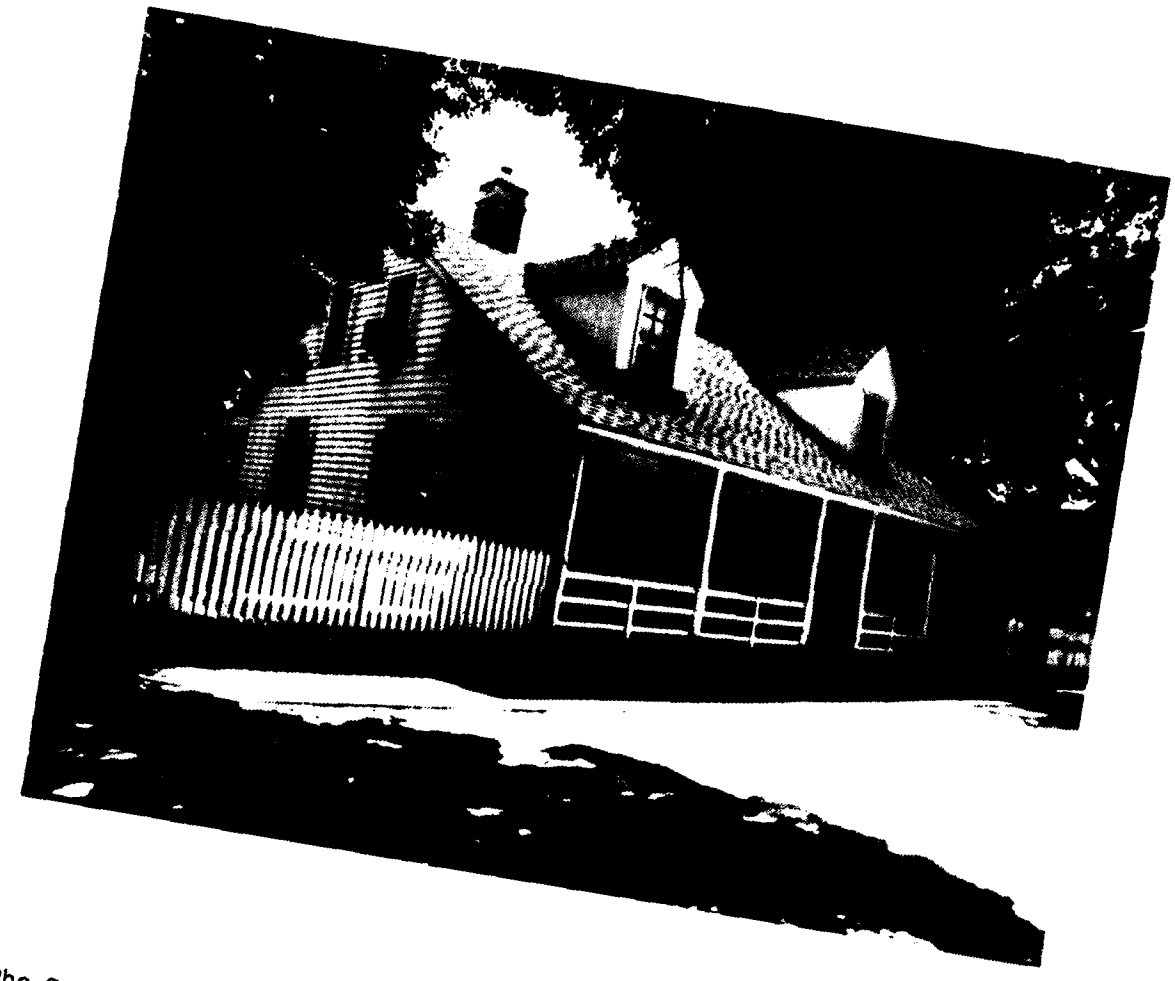
The Bolduc-Lemeilleur house, circa 1814. This view shows the French colonial roofline as it exists when only two sides of the house have the galerie.

The house of Jean Baptiste Valle, commandant of Ste. Genevieve. Circa 1785.

The Jacques Guibord house, circa 1785.

The Felix Valle house, *circa* 1818, showing its stone front.

Side view of the Pierre Dorlac house (circa, 1790), again showing the roofline that accommodates the galerie on only two sides of the house.



The Gemien Beauvais house, circa 1813. One room of the house is log, and probably was built much earlier than 1813.

The Vital St. Gemme Beauvais house, circa 1790. On this house, as on the Gemien Beauvais house, the dormers are late additions.

b. Archaeological Resources.

Prehistoric use of the Ste. Genevieve vicinity was also significant. The Saline Creek, located southeast of Ste. Genevieve and named for the salt springs which border it, was used as a hunting ground at least as early as the Archaic Period (7000 BC to 1000 BC). Beginning during the Woodland Period (1000 BC to AD 900) people engaged in salt making at the salt springs, and this practice continued through the Mississippian Period (AD 900 to AD 1700). The technology of salt production involved the use of large ceramic salt "pans" on which salt was precipitated by evaporating the brackish water obtained from the springs. This technology remained unchanged throughout the Woodland and Mississippian periods, and in fact was also practiced by the early French settlers, the only difference being that the French used iron kettles. Archaeological remnants of Woodland, Mississippian, and French colonial salt production abound on the Saline.

Closer to Ste. Genevieve, the Big Field or Common Fields area just southeast of town was the site of a fortified Mississippian mound and village complex (the Common Field Archaeological Site) dating to about AD 1300 to 1400. Another, later Mississippian village, the Bauman site, was exposed by the December 1982 Mississippi River flood. Located east of Ste. Genevieve and even closer to town than the Common Field Archaeological Site, the Bauman site was unknown to archaeologists before

the December 1982 flood scoured away the alluvial overburden that had concealed it. Mississippian artifacts have also been unearthed within the Ste. Genevieve city limits.

Given the density of prehistoric occupation on the Common Field and along Saline Creek, the potential for locating yet-undiscovered remains is considered good. The prehistoric archaeological potential of the floodplain is usually diminished somewhat by the meandering nature of the Mississippi River channel. Old channels would have been unavailable for occupation during parts of prehistory, and channel changes can obliterate archaeological deposits. But a discovery such as the Bauman site helps to remind us that the river's alluvial deposits can also bury and preserve archaeological sites.

In addition, the possibility is good that archeological deposits dating from the historic period exist on the floodplain, especially in areas immediately east of downtown Ste. Genevieve and along St. Mary's road. A preliminary survey, conducted under the auspices of the St. Louis District, resulted in the discovery of six historic-period archaeological sites on the floodplain east of town. Dates inferred for the sites range from the early 1800's into the present century. Additional, undiscovered, historic deposits probably exist both on the floodplain and in town.

2.3.9 Recreation.

The City of Ste. Genevieve has the following parks available for its citizens:

Names	Acres	Owner
Pere Marquette Park 1/	48.90	City of Ste. Genevieve
Ball Field (Adjoining above park)	4.00	Ste. Genevieve County
Lions Club Park	0.25	Lions Club
Khoury League Field 2/	4.00	Veterans of Foreign Wars

1/ Pere Marquette Park lies outside and abuts the city limits.

2/ The Khoury League Field is intergrated into the public recreation. No charges are made for its use.

Pere Marquette Park has a good mix of recreational facilities including four lighted tennis courts, a swimming pool, various picnic shelters, a basketball court, and assorted play equipment. The park also contains one softball diamond and one baseball diamond. Adjoining Pere Marquette Park is the Ball Field Park owned by Ste. Genevieve County. This space provides one softball field.

Lions Club Park at Market and Second Streets provides a picnic area of three tables in the downtown area. The Khoury League field provides two lighted softball diamonds.

2.3.10 Floodplain Management Ordinances.

In July 1977, the City of Ste. Genevieve adopted a flood damage prevention ordinance that complied with the regular program requirements of the National Flood Insurance Program. The city entered the regular phase of the Flood Insurance Program in September 1977. The city's ordinance severely restricts development in a floodway area that includes the stream and a high velocity flood area adjacent to the stream. Development is allowed in the floodplain fringe area outside of the designated floodway, however, the lowest floor of new structures in this area must be higher than the 100-year flood level.

Ste. Genevieve County adopted floodplain management regulations in February 1982, and entered the emergency phase of the Flood Insurance Program in March 1982. New development in the county is controlled by the use of Flood Hazard Boundary Maps.

2.3.11 Stream and Floodplain Characteristics.

The study area is impacted primarily by the Mississippi River, but also suffers flood damages from North and South Gabouri Creeks.

The Mississippi River and tributary stream floodplain characteristics are briefly discussed in the paragraphs that follow.

a. Mississippi River.

The 500-year Mississippi River floodplain includes a substantial part of the City of Ste. Genevieve. The floodplain is generally four to five miles wide, from the Missouri high ground to the Illinois high ground, while the river at normal depth is less than one half mile wide (see PLATES 2 and 3).

The agricultural lands in the floodplain immediately east of Ste. Genevieve average about one mile in width. Some prime farmland soil units occur in this area but about half of this land is inundated by the 2-year recurrence interval flood and is therefore not classified as prime farmland. Information on existing agricultural levees and the Ste. Genevieve sewage lagoon located in the floodplain is presented in the Agricultural Levees and Wastewater Collection and Treatment sections of this report.

b. Tributary Streams.

Gabouri Creek enters the Mississippi River at river mile 122.5 above the Ohio River. The creek divides into North Gabouri Creek and South Gabouri Creek at a point 0.9 miles from the Mississippi River. Valle

Spring Branch joins South Gabouri Creek about 0.3 miles above this confluence. These tributaries are subject to periodic backwater flooding from the Mississippi River.

The floodplain of North Gabouri Creek is used for pasture or crop production for most of its six mile length. High density urban development occurs in the floodplain from river mile 1.2 to 2.0 from the Mississippi River. The stream channel generally has a gravel and limestone bottom and is lined with trees.

South Gabouri Creek has a highly developed floodplain from river mile 1.4 to 2.3 from the Mississippi River. A few homes are located in the floodplain from river mile 2.3 to 2.9 at U.S. Highway 61. Above U.S. Highway 61 the stream flows through the Mississippi Lime Company mining operation for nearly one mile. For the remainder of its six mile length, the South Gabouri Creek floodplain is generally used for agricultural production. The stream channel generally has a gravel bottom and is lined with trees except in parts of the Mississippi Lime Company area and the town of Ste. Genevieve.

Valle Spring Branch has about two miles of defined channel, from South Gabouri Creek to Valle Spring. However, in the Valle Spring Branch watershed there are other channels that flow into sinkholes and are thought to join Valle Spring underground. There is essentially no development in the Valle Spring Branch floodplain. Most of the defined channel is a drainage ditch through the flat Mississippi River floodplain.

2.3.12 Water Quality.

In December 1982 the Corps of Engineers took water quality samples from North and South Gabouri Creeks and Valle Spring Branch. The sample sites are described in APPENDIX F - ECOLOGICAL RESOURCES. The water quality of the streams met all of the general State of Missouri water quality criteria at the time sampled, except for the reach of South Gabouri Creek downstream from the Mississippi Lime Company mining operation. South Gabouri Creek passes through the mining operation just west of U.S. Highway 61. Storm runoff and mine waste discharges from this operation contribute to water quality problems in the solids, chlorides, and chemical oxygen demand (COD) parameters. This is detrimental to the stream but is an intermittent problem. Except for the above mentioned area, North and South Gabouri Creeks are fairly typical of small streams draining agricultural and urban watersheds.

2.3.13 Aquatic Habitat.

North and South Gabouri Creeks start in the Ozark uplands and join in the Mississippi River floodplain. North Gabouri Creek is a narrow stream with low base flows. The upper end is probably intermittent during drought periods. The stream passes through a mixture of pasture, forest, and cropland in its upper reach and the City of Ste. Genevieve in its

lower reach. The upper portion of the stream has a cobble and gravel substrate with little instream cover. The lower stream has a mixture of bedrock, gravel, cobble and muck for substrate. Instream cover consists of a mixture of man-made and natural debris.

South Gabouri Creek is similar in width, base flows and riparian habitat to North Gabouri Creek. The water in the upper reach is normally clear during low flows and becomes turbid during periods of runoff. The upper stream is shallow with a cobble and gravel substrate with sparse instream cover. The lower stream is shallow with a substrate comprised of gravel and limestone mining wastes. In areas of heavy waste deposits, the material is over one-foot thick. The stream has a milky color presumably from the limestone mining wastes.

At the confluence of North and South Gabouri Creeks the stream is wide and quite deep. Water levels in this segment of stream are influenced by the Mississippi River. The water is normally turbid. Sewage effluent from the municipal lagoon enters Gabouri Creek just above its confluence with the Mississippi River. The bottom substrate consists of muck. Debris at normal water levels and flooded timber at high water levels provide instream cover for fish.

Gabouri Creek enters the Mississippi River at river mile 122.5 above the Ohio River. Man's activities in the Middle Mississippi have severely altered its aquatic habitat. Most of the fisheries habitat in the Mississippi River can be classified as main channel or channel border,

with the channel border being the more biologically productive of the two. A single slough named the Mississippi Slough occurs within the study area. Sloughs are highly productive areas which serve as nursery grounds and are extremely important to the fishery.

A detailed description of fisheries and benthos in the study area is presented in APPENDIX F - ECOLOGICAL RESOURCES.

2.3.14 Terrestrial Habitat.

The primary terrestrial habitat types that would be affected by a project are cropland in the Mississippi River floodplain and urban land in Ste. Genevieve. These areas are generally of minimal value to wildlife because of the lack of habitat diversity in the cropland and human disturbance in the urban area.

The more important terrestrial resources in the study area include the Mississippi Slough, riparian forest adjacent to creeks and the remaining remnants of floodplain forest. When the floodplain is flooded in the spring and fall, it is used by migratory waterfowl.

A detailed description of game and waterfowl in the study area is presented in APPENDIX F - ECOLOGICAL RESOURCES.

2.3.15 Endangered and Threatened Species.

a. Federal.

The bald eagle is a winter resident that occurs along the Mississippi River feeding primarily on fish and waterfowl. The riparian habitat in the study area is potential Indiana bat summer habitat. However, there are no known nursery colonies in the study area.

b. State.

A number of state-listed plant and animal species may occur in the study area and are listed in APPENDIX F. There is no known important habitat for any of these species in the study area.

2.3.16 Mineral Resources.

The major mineral commodities of the area are lime, crushed stone, building stone, and sand and gravel. The Mississippi Lime Company is the only lime producer in the county and the largest in Missouri. This operation produces both quick lime and hydrated lime from the relatively pure $CaCo_3$ oolite beds in the Salem Limestone. A large area (greater than 1,500 acres) immediately west of Ste. Genevieve has been undermined.

In addition to lime production, limestone is also quarried for use as crushed stone and building stone. One of the largest limestone quarries in the area is the Tower Rock Stone Company quarry located north of Ste. Genevieve. The stone from this quarry is extracted from the Salem Limestone. A few smaller limestone quarries are also located in the county, however, most of these are currently idle.

Sand and gravel workings are located on the Mississippi River floodplain and in the upland tributary streambeds. Many of these deposits are worked intermittently as required by construction demand. The nearest sand operation is approximately three miles south of Ste. Genevieve, adjacent to the site of the old village.

2.3.17 Water Supply.

The major source of water in the area is derived from unconfined aquifers in the Mississippi River Recent alluvium. The Ste. Genevieve municipal water system and various private users draw from shallow, high yield wells in the floodplain sands and gravels. West of the floodplain some private wells penetrate bedrock aquifers, however, yields are generally low and depths to reliable supplies are often excessive.

The Ste. Genevieve municipal water system is supplied by four wells having a combined capacity of approximately 1725 gallons per minute. The fourth well was recently added to handle additional demand due to

projected future growth. The wells are close to each other and are located east of the St. Louis and San Francisco Railroad and between Merchant Street and Market Street. The wells produce good quality water requiring only softening, except for the fourth well which also requires magnesium removal.

The system services a total of 1789 customers in and around the municipality and has a total capacity of 1.2 million gallons per day. The average daily consumption rate is 650,000 gallons per day, or an average of 363 gallons per customer per day.

The municipal water wells have never been inundated by a flood. The 1973 flood reached 17 inches below the top of the wells. Subsequently, the wells were raised 40 inches, so that the tops of the casings are now 57 inches above the 1973 flood height. The well casings' elevations are approximately 395 feet NGVD, which is about one half foot higher than the 100-year flood.

2.3.18 Wastewater Collection and Treatment.

The sewerage system of the City of Ste. Genevieve presently serves the incorporated area of the city. The system consists of a sewage collection network, two lift stations, and a two-cell sewage lagoon.

Approximately 30 miles of sewers collect and transport an average of 650,000 gpd (dry weather flow) to the lift stations. The sewage is then pumped through a 10-inch cast iron pipe to the two-cell lagoon for treatment. The lagoon consists of primary and secondary cells surrounded by a berm. The berm has an approximate elevation of 385 feet NGVD and provides approximately 8-year flood protection for the lagoon. The treated effluent from the lagoon is discharged into Gabouri Creek just above its confluence with the Mississippi River.

During the December 1982 Mississippi River flood, the 10-inch pressure sewer line was exposed in a scour hole at the northwest corner of the sewage lagoon and broke. As a result, the influent was discharged into the surrounding floodplain floodwaters. Also, the berm on the southwest corner of the primary cell was almost completely degraded by the scour and wave action of the floodwaters. Again, the sewage contained within the lagoon drained out into the surrounding floodplain. The 10-inch pressure sewer was repaired and it now discharges into the secondary cell instead of the primary cell.

Ste. Genevieve is planning to construct a new sewage treatment plant on a filled site northwest of the sewage lagoon. Funds for the project will be provided by the city, the Federal Emergency Management Agency and the State of Missouri. The new plant will provide secondary treatment and is designed so that it will not be damaged by a 100-year Mississippi River flood.

2.3.19 Agricultural Levees.

The agricultural levees in the the Mississippi River floodplain in the vicinity of Ste. Genevieve are shown on PLATE 2. They include three levees constructed by the Corps of Engineers, the Prairie du Rocher levee across the Mississippi River, the Kaskaskia Island levee southeast of Ste. Genevieve, and the Perry County levee further south. These levees are described in the Existing Water Projects section of this report. A levee constructed by the Ste. Genevieve County Levee District #2 is immediately southeast of Ste. Genevieve.

The Ste. Genevieve County Levee District #2 levee is a non-Federal levee that protects an agricultural area between Ste. Genevieve and Kaskaskia Island. This levee is overtopped by approximately a 10-year Mississippi River flood. There are no known plans to raise this agricultural levee. The Corps of Engineers has repaired the levee several times under the authority of Public Law 99, 84th Congress.

2.3.20 Temporary Flood Control Measures.

The community of Ste. Genevieve engages in flood fight efforts during Mississippi River floods. The effort to reduce flood damages generally involves both the temporary removal of some damageable contents from flood prone buildings and the construction of emergency levees. Emergency levees are constructed with sandbags filled with screenings

from the Mississippi Lime Company mining operation, or by piling these screenings or other materials, compacting the materials, and covering the river side with plastic sheeting. Interior drainage and basement flooding is reduced through the use of tractor powered pumps and small gasoline pumps. Volunteer labor is utilized, including teens who are let out of school and adults who take off from work. The flood fight effort is managed by City of Ste. Genevieve and St. Genevieve County Levee District #3 officials, and assistance is provided by the Corps of Engineers.

In recent Mississippi River floods, the emergency levees have not failed or been overtopped. However, because of the development pattern and the topography in Ste. Genevieve, only about half of the buildings subject to flooding are protected. The remainder have been subjected to long periods of inundation, many with water several feet above the first floor. Floods higher than the 1973 flood would probably fail or overtop many emergency levees.

Emergency levees are usually removed after a flood. However, after the December 1982 flood sandbag levees throughout the City of Ste. Genevieve were left in place in anticipation of spring flooding. The April and May 1983 floods proved the wisdom of this decision.

The city is leaving several small levees in place indefinitely, and has constructed levee segments on the north and south sides of North

Gabouri Creek, primarily to protect areas from Mississippi River flooding. The sandbag levees and other levees constructed in Ste. Genevieve are considered temporary by the Corps of Engineers because of their soil type, size and method of construction.

2.4 FUTURE CONDITIONS IN THE STUDY AREA WITHOUT CORPS PROJECT

The future conditions expected to be most likely in the study area without a Corps of Engineers flood control project are discussed below. Only those items that are expected to be substantially different from existing conditions are discussed, i.e., population, economy, cultural resources, and recreation.

2.4.1 Population.

Population projections for the Ste. Genevieve area are based on 1980 OBERS data for the NON-SMSA part of Bureau of Economic Analysis Economic Area 107: St. Louis, Missouri (MO Part). The OBERS projections indicate approximate increases in population of 3.1 percent from 1980 to 1990 and 2.3 percent for each succeeding decade through the year 2030. The total population projected for Ste. Genevieve County then becomes 15,651 for 1990, 16,011 for the year 2000, and 17,141 for 2030. The City of Ste. Genevieve's population is then projected to be 4,874 for 1990, 4,986 for the year 2000, and 5,338 for 2030. Due to Ste. Genevieve County's close proximity to the St. Louis Standard Metropolitan Statistical Area, the rates of increase may be slightly higher.

2.4.2 Economy.

Two of the five current primary areas of employment for Ste. Genevieve County, professional services and retail trade, are projected to increase their number of employed through the year 2030. The number of individuals working in manufacturing and construction is projected to increase through 1990 and 2010, respectively. Agricultural employment will continue to decrease. These increases and decreases reflect minor changes in the total number of jobs available.

Median family income, $18,693 for 1979, using OBERS projections will be approximately $23,404 in 1990, $28,857 in the year 2000, and $55,232 in 2030.

The overall economic outlook for Ste. Genevieve County is one of little change. Many individuals are unable to find jobs and leave the area for this reason. There are no major indicators that the job market will change significantly in the future. Though tourists are attracted to the City of Ste. Genevieve's historic resources, frequent flooding makes it difficult to improve the area and maximize the tourism potential.

2.4.3 Cultural Resources.

The effects the future may bring to both historical resources and archeological resources are discussed below.

a. Historical Resources.

It has already been stated that 87 of 154 historically significant buildings in Ste. Genevieve are within the Urban Design or Standard Project Flood zone. It goes practically without saying that floods can cause irreparable damage to structures, and these 87 buildings will continue to be susceptible to such damage. Attrition of historic structures due to flooding has been occurring throughout Ste. Genevieve's history, and will continue as long as flood protection is not in place.

Some information pertaining specifically to French colonial buildings has been obtained from the University of Missouri's community study at Ste. Genevieve. In 1803, there were roughly 150 French colonial buildings in Ste. Genevieve; of these, 35 now remain. Between 6 and 10 buildings were lost in the last decade alone. Not all of the buildings destroyed have been lost directly as a result of flooding, but it is known (for example) that the 1973 flood damaged two French colonial buildings beyond salvage. More than eighteen floods of similar magnitude (though lower in stage) have occurred in the last 140 years and must have contributed to the attrition of historic buildings, and future flooding will continue the trend. Given that over two-thirds of Ste. Genevieve's original French colonial buildings have been lost in 180 years, this facet of the town's historical resource must be considered endangered.

b. Archaeological Resources.

Archaeological deposits in floodplain soils are particularly prone to disturbance and destruction by flooding. The Common Fields Archaeological Site provides an example. This site was severely damaged by scouring floodwaters during the December 1982 flood. Additional damage occurred during the 1983 floods. The Bauman site, already mentioned as one exposed directly as a result of Mississippi River flooding during December 1982, was also partly damaged by deep, flood-caused erosion. A photograph of the Bauman site is shown on the following page. The St. Louis District did not inspect damage which may have accrued to the historic period archaeological sites near town, mentioned earlier in this report, but it is reasonable to expect that these sites were also damaged during the 1982 and 1983 floods.

Because floodplain sites are lower in elevation than the town of Ste. Genevieve, these archaeological resources will experience damage even more frequently than the town itself. In fact, most of the floodplain immediately east of town lies within the two-year frequency flood zone. Undoubtedly, recurrent damage has occurred to archaeological sites there, and will continue.

Erosional damages to the Bauman site, caused by 1982 and 1983 Mississippi River flooding. Some artifacts collected from the site are shown in the foreground.

2.4.4 Recreation.

The 1978 Comprehensive Plan for the City of Ste. Genevieve shows a future interest in acquiring and developing parks in a linear fashion up North and South Gabouri Creeks and Valle Spring Branch. Neighborhood parks are spread throughout the city. The plan recommends the development of small parks at the St. Jude subdivision and the Point Basse area. No timetable has been set or money appropriated for these goals.

2.5 PROBLEMS AND OPPORTUNITIES

The flooding and related problems and opportunities in Ste. Genevieve are discussed in this section of the report. They include flooding problems, attrition of historic structures, historic preservation opportunities, recreation needs, and ecological enhancement opportunities.

2.5.1 Flooding Problems.

Mississippi River floods in Ste. Genevieve generally are long duration events with flood levels rising and falling over several days or weeks, and usually flood forecasts are received in the community several days in advance of flood crests. Headwater floods on North and South Gabouri Creeks are usually flash floods with little or no warning time available except through general National Weather Service flood alerts based on expected rainfall.

a. Past Flooding.

Major Mississippi River floods have been recorded at Ste. Genevieve in 1844, 1903, 1908, 1909, 1927, 1929, 1935, 1942, 1943, 1944, 1947, 1951, 1969, 1973, 1979, 1982, and 1983. TABLE 2 provides information on these floods at the Chester, Illinois gage 13 miles down river from Ste. Genevieve.

TABLE 2
MAJOR FLOODS OF RECORD
MISSISSIPPI RIVER
AT CHESTER, ILLINOIS[1]

Year	Date	Duration[2]	Maximum Gage Height	Zero[3]	Discharge (cfs)
1844	30 Jun	--	39.83		1,350,000
1903	13 Jun	16	33.4	127.29	--
1908	21 Jun	35	30.75	127.29	895,000
1909	17, 18 Jul	12	31.0	127.29	890,000
1927	26 Apr	58	34.41	348.13	1,060,000
1929	29 Apr	75	33.1	348.13	878.000
1935	8 Jun	38	32.8	340.83	697,000
1942	1 Jul	22	34.0	341.05	--
1943	24 May	49	38.08	341.05	873,000
1944	2 May	46	37.55	341.05	842,000
1947	4 Jul	65	38.17	341.05	886,000
1951	23 Jul	61	39.3	341.05	795,000
1969	15 Jul	48	35.73	341.05	644,000
1973	30 Apr	102	43.32	341.05	886,000
1979	16 Apr	61	39.79	341.05	760,000
1982	9 Dec	60	39.8	341.05	831,000
1983	5 May	63	41.02	341.05	740,000

1. Period of record: 1844 through 1983. Stage readings and continuous discharge records since 1891 and 1927, respectively. Stage readings prior to 1965 at river mile 109.5; 1965 to date at river mile 109.9.

2. Duration = consecutive days above flood stage. Flood stage = 26.0 feet, prior to 1945. Flood stage = 27.0 feet, 1945 to date.

3. Zero of gage. 1891 to 1912 Engineer Office Datum (0 = 127.29), 1911 to 1931 Memphis datum (0 = 348.13), 1932 to 1936 Mean Gulf Level (0 = 340.83), and 1936 to date Mean Sea Level or National Geodetic Vertical Datum (0 = 341.05).

According to historical accounts, a major flood in 1785 devastated the old town of Ste. Genevieve which was located on the right bank of the Mississippi River in the floodplain at that time. Only chimneys and roof peaks remained above the water level during this flood. Following the 1785 flood the town was gradually moved from the old site to its present location.

At its present location, Ste. Genevieve is still subject to disastrous floods. The town has experienced some of its worst flooding in recent years. The 1973 flood reached the highest level on record at Ste. Genevieve. This flood is considered to have about a 30-year recurrence interval. The 1844 flood was the next highest, followed by the 1983, 1982 and 1979 floods. These floods fall into the 15 to 25-year flood range. Photographs and newspaper accounts from recent floods are shown on the pages that follow.

The 1973 Mississippi River flood resulted in one fatality during the flood fight effort. A detailed post-flood Corps of Engineers study found that the flood caused about $3,000,000 in flood losses in Ste. Genevieve in 1973 dollars. This figure included $1,500,000 in damages to urban structures. Detailed post-flood damage studies were not conducted by the Corps for the other floods listed in TABLE 2. Ste. Genevieve officials estimated that the December 1982 flood caused $2,400,000 in damages. The other floods listed were also highly disruptive and damaging.

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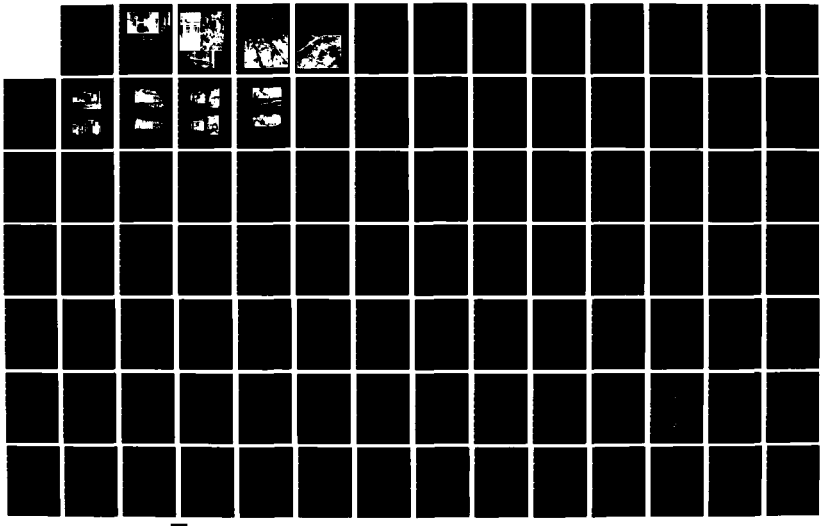
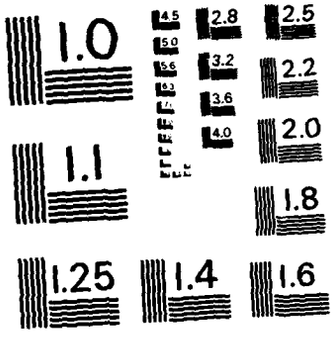




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Sedalia Democrat, May 6, 1983

People in historic Missouri town worry about rising Mississippi River

STE. GENEVIEVE, Mo. (AP) — Residents of this historic Mississippi River town kept an anxious eye today on the weather, not yet fully convinced they had won their battle against near-record flooding.

The National Weather Service's forecast for late today called for bands of thundershowers to roam across eastern Missouri. Even more worrisome, said Civil Defense Director Neil Wehner, were predicted high winds which would smash waves of the swollen river against weakened levees.

"This could give us more problems than another half-foot of river rise," said Wehner as the Mississippi, out of its banks for the third time in five months, began cresting at 40.8 feet, nearly 14 feet above flood level, at Chester, Ill., about 12 miles downstream.

"If we should happen to get a heavy downpour, like two inches in a half an hour, we could be in trouble," Wehner said. "we're just hoping and praying that it doesn't happen."

Wehner said about 400 students from Ste. Genevieve's public high school and Valle Catholic high school pitched in Thursday to help townspeople sandbag the levees and minimize flood damage.

"It was critical up until about noon. I'm sure that there's going to be terrific sewer damage, street damage you name it," Wehner said. "Fortunately, our wells are high enough where it hasn't affected them."

As floodfighters re-enacted a drama they had been through in April and before that in December, a resident of the community of 4,700 became a hero by rescuing five young children from a smoke-filled house.

William Hoffman said he had heard the children's babysitter, Dennis Hughes, yell "fire" from a house located a block away across his flooded backyard. "So I took out my boat, went over and got those kids," Hoffman said.

Police and rescue teams used hand extinguishers to put out the blaze in the southeastern part of the city, located 57 miles downstream from St. Louis.

Wehner said the flooding at Ste. Genevieve, which was founded in 1735 by French trappers, was more severe than that experienced last December and had forced between 100 and 150 townspeople from their homes.

The evacuees were among more than 500 forced out by flooding along the Mississippi, Missouri and Meramec rivers near St. Louis. By Thursday, both the Meramec and Missouri had begun rapid drops at points which included dioxin-stricken Times Beach in St. Louis County.

Corps of Engineers officials estimated the flooding had already caused $40 million in damage to homes and businesses despite the use of 231,000 sandbags to strenghten soggy levees.

A Weather Service meteorological technician, Dean Hutsell, said the Mississippi, barring heavy amounts of additional rainfall, could be expected to drop rapidly the remainder of the week. A predicted crest on the river at Cape Girardeau downstream had been revised from a record 46.5 feet Saturday to 45.5 feet late today.

DECEMBER 1982 FLOOD

ONCE AGAIN
STEADY RAINS
SWELL AND
ENRAGE THE
MISSISSIPPI,
BRINGING TEARS
AND TRAGEDY

Ste. Genevieve Herald
December 8, 1982

Excerpts from the *Ste. Genevieve Herald*, April 26, 1979

Flood Victims Here May Apply For Aid Today At VFW Hall

City Administrator Ron Thomure announced Tuesday that a Federal Disaster Assistance Center would be set up at the VFW Hall on Thursday and Friday, April 26 and 27 to take applications for assistance from local flood victims The Disaster Center will be open between the hours of 10 a m and 7 p m

Representatives of the Housing and Urban Development will be on hand to assist those who need help with housing. And officials from the Small Business Administration will be present to aid with business losses.

The Disaster Center is being set up to aid the flood victims in Ste. Genevieve County as this county was among the fourteen Missouri counties declared as disaster areas by President Jimmy Carter Saturday.

Apprehension reigns in the Ste. Genevieve area as the flood waters recede and cleanup is begun, amid an almost steady drizzling rain

City Administrator Ron Thomure said Tuesday that cleanup is coming along "fairly good," but a cautious decision has been made to keep much of the sandbag levees in place On Washington Street and on Main Street workers cleared one lane for traffic flow, but walls of plastic-covered sandbags still stand in the low areas of town as stark reminders of what was, and what it is feared yet could be.

April 1973 Flood

Excerpts from the *Ste. Genevieve Herald*, SPECIAL EDITION, August 1, 1973

GREAT FLOOD OF 1973

Residents of the City of Ste. Genevieve saw history repeat itself this spring when the waters of the mighty Mississippi reached a record crest of 43.31 feet on April 28, 1973, surpassing the previously established crest of 1785.

Early in March news about an expected rise in the great river spread about the town. Corps of Engineers records show the river was first over the flood stage at Chester, Ill., on March 9, when it reached 28.5 feet. The Chester flood stage is 27 feet.

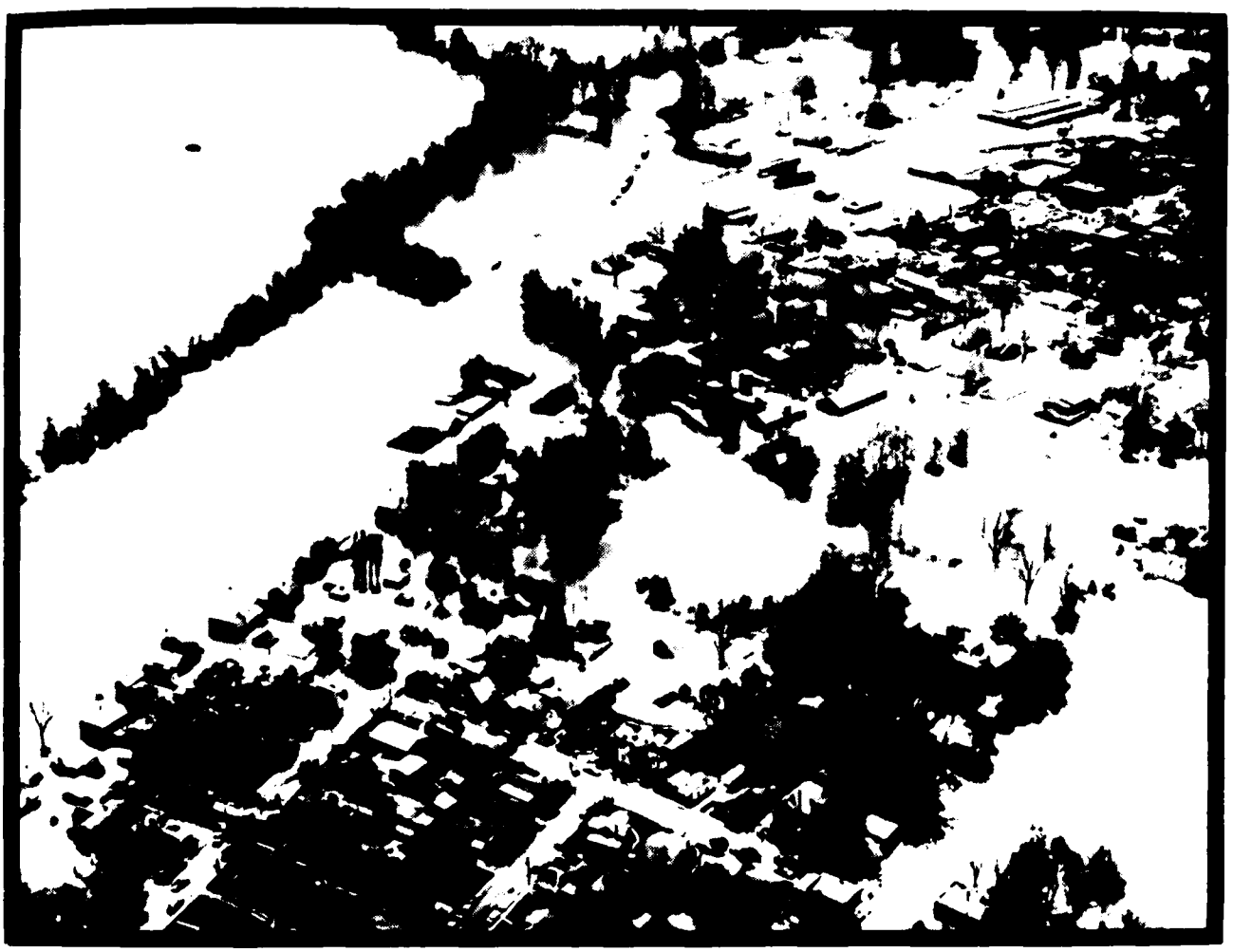
Students from Ste. Genevieve High School and Valle High School were released from classes early in the week, well ahead of the April 5 crest, to help sandbagging operations. Other volunteers also showed up at the Main St. area to offer assistance. Families moved from their homes, many never to return; emergency stations with 100 cots were set up at the Knights of Columbus and the VFW Hall for those left homeless. Highway 61 was completely shut off from Ste. Genevieve to St. Marys with everything east of it under water.

Throughout the flooding before the climatic crest of April 28, old timers clung to their beliefs. They knew the river could get high, but most thought it just doesn't reach proportions of the 1785 flood anymore.

But it did happen. The largest crest on record, 43.31 feet, was reached on April 28. An account in the weekend edition of the St. Louis Globe Democrat, April 28-29, stated that water covered almost a third of the City of Ste. Genevieve.

The river made a slow move downward, spreading its decline over the better part of May.

The flood of 1973 had ended. The horror of its devastation was still there.



During Mississippi River floods, the community flood fight effort generally results in parts of the town being protected and other areas flooding. Even in areas protected by sandbag and other emergency levees, homes and buildings often have serious problems with basement flooding. The flood fight effort is a major operation involving heavy equipment, a great amount of material and many volunteers. In the December 1982 flood, 160,000 sandbags were placed and several levees were constructed of loose material covered by plastic sheeting.

Headwater floods on North and South Gabouri Creeks are not as well documented as the Mississippi River floods. There are no stream gages on these creeks. Interviews with local residents and newspaper accounts indicate that large floods occurred on both streams in 1922, 1957, 1961, 1964, 1972, 1977, 1979, and 1982. High water marks were obtained from the 1957, 1977, 1979, and 1982 floods. Other smaller floods have occurred. No estimates were made of the damages resulting from these historical floods on the tributary streams.

b. Potential Flooding.

In the future Ste. Genevieve will probably experience higher floods than occurred in the past, on both the Mississippi River and North and South Gabouri Creeks. In order to quantify the potential for flood damages, the Corps of Engineers developed mathematical computer models to

define flood heights along the Mississippi River and North and South Gabouri Creeks. The Corps inventoried all buildings subject to flooding and determined potential flood depths and damages in these buildings.

The hydrologic and hydraulic studies made to define flood heights in Ste. Genevieve are described in detail in APPENDIX C - HYDROLOGY AND HYDRAULICS. Flood profiles for the 2, 5, 10, 25, 50, 100-year floods and the Urban Design Flood (UDF) were defined for the Mississippi River. The Urban Design Flood, as defined in association with the City of St. Louis Flood Protection Project, is considered comparable to the 500-year flood. Flood profiles for the 2, 5, 10, 25, 50, 100, 500-year and the Standard Project Flood (SPF) floods were defined for North and South Gabouri Creeks. For both the tributary streams and the Mississippi River, Corps studies found that potential flood heights with future development are essentially equal to potential flood heights with existing development conditions.

The inventory of flood prone structures in Ste. Genevieve includes a 2-foot contour map with an identification number on each structure, the first floor elevation of each structure (nearly all instrument surveyed), the type of structure (e.g. two story with basement), the value of the structure, the river or stream mile location of the building, historic information on the building, the address, and other information about the building.

The St. Louis District's Urban Damages II economics computer model was used to compare flood heights with the inventoried structure data. A detailed discussion of the economics information developed is presented in APPENDIX H - ECONOMICS. The flood susceptibility of historic buildings is discussed in detail in APPENDIX E - CULTURAL RESOURCES. Summaries of the potential urban flood damages and the number of historic buildings damaged by the Mississippi River, South Gabouri Creek and North Gabouri Creek are presented in TABLES 3, 4 and 5, respectively. Direct economic losses to the nation as a result of flooding in Ste. Genevieve are $459,000 annually in the urban area and $25,700 annually in the agricultural floodplain east of the community.

2.5.2 Historic Structure Attrition.

What besides the exact age of a community determines the character of its historical and architectural heritage? Though any community can, by strict definition, claim a "historic" section, no village, city, or locality will call its own history exactly similar to that of its neighbors. Once-tiny settlements have blossomed steadily and rapidly into gigantic cities, engulfing lesser towns as they grew. Some communities have experienced cycles of boom and bust; others have grown, flourished briefly, then dwindled; some have been left abandoned, becoming "ghost towns"; still others have been ravaged by natural and human-caused disasters. Processes like these have many examples. The Eastern Seaboard and the northeastern States, as cases in point, very

TABLE 3

SUMMARY OF POTENTIAL URBAN FLOOD DAMAGES
AND HISTORIC BUILDINGS DAMAGED
BY MISSISSIPPI RIVER

	In Areas Outside City Limits North of Valle Spring Branch (Area 500)		In Area South of South Gabouri Creek (Area 1)		In Area between North and South Gabouri Creek (Area 2)		In Area North of North Gabouri Creek (Area 3)		In Total Study Area	
Flood Event	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged
2 Year	0	0	0	0	0	0	0	0	0	0
5 Year	0	0	0	0	8	1	0	0	8	1
10 Year	2	0	3	1	45	3	21	1	71	5
25 Year	12	0	13	1	109	18	76	7	210	26
50 Year	16	1	33	2	131	27	114	9	294	39
100 Year	16	1	55	7	167	42	139	14	377	64
500 Year	16	1	66	8	221	61	180	16	483	86

Flood Event	Economic Damages	Economic Damages	Economic Damages	Economic Damages	Economic Damages
2 Year	$ 0	$ 0	$ 0	$ 0	$ 0
5 Year	0	0	3,000	0	3,000
10 Year	36,000	12,000	670,000	32,000	751,000
25 Year	119,000	70,000	2,339,000	407,000	2,935,000
50 Year	182,000	183,000	3,390,000	1,216,000	4,970,000
100 Year	216,000	398,000	4,287,000	1,960,000	6,861,000
500 Year	253,000	892,000	5,684,000	2,945,000	9,773,000
Average Annual Damages	$ 13,000	$ 14,000	$262,000	$ 68,000	$357,000

TABLE 4
SUMMARY OF POTENTIAL URBAN FLOOD DAMAGES
AND HISTORIC BUILDINGS DAMAGED
BY SOUTH GABOURI CREEK

Flood Event	In Area South of South Gabouri Creek		In Area North of South Gabouri Creek		In Total Study Area	
	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged
2 Year	4	3	4	3	8	6
5 Year	6	3	14	6	20	9
10 Year	7	4	21	8	28	12
25 Year	8	4	24	8	32	12
50 Year	11	4	30	9	41	13
100 Year	13	4	32	10	45	14
500 Year	19	4	51	14	70	18
SPF Flood	19	4	65	15	84	19

Flood Event	Economic Damages	Economic Damages	Economic Damages
2 Year	$5,000	$3,000	$8,000
5 Year	53,000	22,000	75,000
10 Year	73,000	185,000	258,000
25 Year	96,000	284,000	380,000
50 Year	114,000	379,000	493,000
100 Year	127,000	487,000	614,000
500 Year	181,000	844,000	1,025,000
SPF Flood	264,000	1,535,000	1,798,000
Average Annual Damages	Average Annual Damages $27,000	Average Annual Damages $45,000	Average Annual Damages $72,000

TABLE 5
SUMMARY OF POTENTIAL URBAN FLOOD DAMAGES
AND HISTORIC BUILDINGS DAMAGED
BY NORTH GABOURI CREEK

Flood Event	In Area South of North Gabouri Creek		In Area North of North Gabouri Creek		In Total Study Area	
	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged	Bldgs. Damaged	Hist. Bldgs. Damaged
2 Year	0	0	1	1	1	1
5 Year	0	0	5	1	5	1
10 Year	10	1	8	2	18	3
25 Year	18	1	21	3	39	4
50 Year	30	2	42	5	72	7
100 Year	37	2	61	6	98	8
500 Year	66	11	91	7	157	18
SPF Flood	93	22	117	12	210	34

Flood Event	Economic Damages	Economic Damages	Economic Damages
2 Year	$0	$1,000	$1,000
5 Year	0	10,000	10,000
10 Year	25,000	20,000	45,000
25 Year	119,000	41,000	159,000
50 Year	246,000	118,000	364,000
100 Year	345,000	207,000	551,000
500 Year	739,000	565,000	1,304,000
SPF Flood	1,333,000	1,093,000	2,426,000
Average Annual Damages	$17,000	$13,000	$30,000

early became an industrial and mercantile heartland of the new United States. As the American populace grew in number, the great cities grew up, urbanized and modernized, and material vestiges of their early history were often lost--they stood in the way of progress. St. Louis, founded in 1764 and by the late 1800's the country's fourth largest city, saw its development proceed in this way, and in the 1980's the headache ball still re-makes history while St. Louis renews and modernizes its downtown business district. Nothing from the French colonial period remains standing in St. Louis. Across the river, Cahokia, Illinois was founded in 1699, thrived for half a century, but was eclipsed by St. Louis, the younger town. In Cahokia, only a single structure remains which pre-dates the 19th century--and it was built a full century after the town's inception. Up north, the City of Chicago also rapidly outgrew itself, and long before skyscrapers rose on the old settlement, a great fire destroyed so much real estate that the city's entire geographic pattern--its shape and orientation--changed. Because of a similar big fire, the City of New Orleans lacks nearly all of its French colonial architectural heritage. The Vieux Carre includes only 14 buildings of national historical importance. Above New Orleans, Mississippi River floods have claimed practically all the rest of Louisiana's French colonial architecture. The Mississippi River also was responsible in 1881 for the near obliteration of Kaskaskia, Illinois, located just downstream of Ste. Genevieve and actually founded somewhat earlier.

On the other side of the coin, a few very old colonial communities have grown gradually, with little or no disruption. They are less often neighborhoods within cities, more often small rural towns whose heritage has not been consumed by rapid growth. Communities of this sort are rare indeed. Ste. Genevieve is one of them.

It has been said that Ste. Genevieve did suffer a disastrous flood in 1785. It is important, for the town's historical and architectural continuity, that buildings were moved at that time to the present townsite, and that modern-day Ste. Genevieve grew up around them. Because the city government was aware, by the time it sought National Landmark designation, that the town possessed a unique, significant and irreplaceable material heritage, a local ordinance was enacted which prohibits demolition of those buildings included in the landmark inventory. Historic preservation is endorsed by the community as a whole, and it is unlikely that decisions of the city government, real estate developers, or individual landowners will result in the loss of historic properties. The social context of the 1980's is very important in this regard. All over the United States, business people and homeowners have taken a profound interest in occupying, utilizing and rehabilitating historic buildings in ways consistent with their original designs. The Preservation News recently reported nationwide expenditures of $2.2 billion during fiscal year 1983 for restoration, rehabilitation, and preservation of income-producing historic properties alone.

In Ste. Genevieve, it should not be expected that historic properties will be lost due to administrative, business, or homeowner decisions. Only accidents of man (e.g., fires) and nature--especially floods--are likely to diminish the town's historic properties. Flood-caused attrition of historic buildings is the major problem and concern. The photographs following this page depict residences of several architectural periods, and show the effects of Mississippi River flooding upon them.

A single episode of severe flood damage can cause the loss of a historic building. A structure may also be gradually ruined by repeated floodings through time. The French colonial poteaux-en-terre structures, with their wood and earth foundations, would appear particularly susceptible to this sort of hazard. An example of gradual damage occurs in the Jean-Paul Robert house (built in 1797) on North Gabouri Creek. Repeated inundations have caused the original horizontal timber floor joists to rot, thereby jeopardizing the entire structure. Even stone foundations will succumb to repeated seepage problems.

TABLES 3, 4 and 5 provide data on the number of historic buildings flooded by the Mississippi River, North Gabouri Creek and South Gabouri Creek at several levels of flooding. This information helps to highlight the number of buildings subject to relatively frequent flooding. The low lying historic buildings are also those most likely to be completely lost during a rare, more severe flood, because they would experience the

The Michael Placet House, a French Colonial residence built in 1791.

The Michael Placet House during the Mississippi River flood crest, May 5, 1983.

The Christina Luecke building (left) built about 1840 in the German architectural style, and the Wendolia Obermiller building (right) built in the 1840's in the American Frame architectural style.

The same two buildings during the Mississippi River flood crest, May 5, 1983.

Two homes in the High Victorian Italianate architectural style, built about 1870.

The same two homes during the Mississippi River flood crest, May 5, 1983.

A home in the American Frame architectural style, built about 1890.

The same home during the Mississippi River flood crest, May 5, 1983

highest water levels, the longest duration of flooding and the highest water velocities along the tributary streams.

Some clues regarding structure attrition due to flooding are provided by archaeological survey and by old maps of Ste. Genevieve. Historic archaeological sites on the floodplain east of town have already been discussed. An 1867 map of Ste. Genevieve shows the town extending onto the floodplain east of St. Mary's Road, and all the way to the confluences of North and South Gabouri Creeks. These locations coincide with historic archaeological sites. By the time another map was made in 1880, few buildings were left east of St. Mary's Road or east of Front Street. This is not certain evidence that flooding was the cause for abandonment, but these areas are within flood zones of two to five-year frequency.

There are other dimensions of the problem. A family considering owning, occupying, and maintaining a historic home will obviously be discouraged from making the financial and emotional commitment if the home is floodprone. The difficulty of keeping a floodprone structure in good repair not only affects its attractiveness on the real estate market, but also, in the long run, has adverse consequences for its historic integrity, even if total loss does not immediately result.

A final problem relates to economic incentives for rehabilitation of historic buildings (to be discussed fully in the next section). Just as

anyone will be discouraged from purchasing and residing in a floodprone historic home, so will people be likely to regard purchase, or rehabilitation or restoration, of a floodprone building a risky business investment. That businesses can be operated in a manner compatible with, in fact beneficial to, a historic property is amply demonstrated at two of Ste. Genevieve's restaurants, the Old Brick House (built 1790) and the Anvil (built in the 1850s). Neither building has ever been flooded; both have been kept in fine condition, the original structures utilized and preserved. Capital investments in preservation have been made. Would the same commitments of capital and compatible use have been made if the buildings were flood-prone? Common sense suggests that they would not.

There are many interacting factors that cause historic structure attrition. Among these, flooding is the first, primary link in a causal chain that results in structure attrition. The mere fact that a building is floodprone directly affects its property value, has impliactions for the owner's financial capability to undertake restoration, can mean frequent interruption of occupany, can discourage the historically-minded buyer, and so forth. The ultimate fate of a historic building is thus dependent upon a number of factors, listed here and above. But the single factor that sets all the others into motion, the primary causal factor, is flooding.

2.5.3 Historic Preservation Opportunities.

That Ste. Genevieve enjoys such a rich and pristine historic architectural heritage is in itself a major opportunity for historic preservation. Several other factors serve to enhance this opportunity.

The first is the Economic Recovery Tax Act of 1981 (ERTA). This act provides generous tax incentives for restoration and rehabilitation of income-producing buildings (buildings used at least partially to house a business), if the building is a "certified" historic property. A "certified" historic property is one that is listed on, or is eligible for listing on, the National Register of Historic Places. It has already been said in this report that 79 structures in Ste. Genevieve currently enjoy this designation, and that the University of Missouri community study team is working to update and expand the list. The success of ERTA in stimulating historic restoration and rehabilitation is demonstrated by the fact that, as of November 1982, over $290 million had been spent in Missouri under the auspices of ERTA.

The Federal Government also provides incentives for student preservation internships, preservation education, and for the restoration of historic residences, businesses, and neighborhoods. Ste. Genevieve itself can create the opportunity, through the mechanisms of local ordinances and preservation planning, both to preserve its cultural heritage and to provide a model case of development compatible with indigenous, surviving historical properties.

The most significant opportunity on the horizon for Ste. Genevieve will result from the University of Missouri's community study, which promises to provide an unsurpassed knowledge and understanding of the town's cultural, historical, and architectural heritage. Rather than being specific to the 79 original landmark properties, this study is treating the community as a whole, thereby creating the opportunity for broad-based public education and involvement, for a well-rounded program of historic architectural preservation, and for quality long-range planning.

The Federal government has the opportunity indirectly to stimulate and enhance local historic preservation activities by providing flood protection.

2.5.4 Recreation Needs.

Comparison of existing and planned recreation facilities with the projected demand for recreation showed that there are unmet needs for the following types of facilities; picnicking, softball, tot lots, disc golf course, exercise trail, open play areas, hiking trails, and bicycling trails.

2.5.5 Ecological Enhancement Opportunities.

The St. Louis District, in coordination with the US Fish and Wildlife Service, determined that opportunities for ecological enhancement include creation of wildlife habitat and marsh habitat in the study area.

2.6 SPECIFIC STUDY AREA OBJECTIVES

The planning objectives for the Ste. Genevieve study are listed below. Management measures and plans examined in the study address one or more of these objectives.

a. Reduce the loss of life, the damages to historic structures, the disturbance to the historic setting, the economic losses, and the social disruption caused by flooding of the Mississippi River.

b. Reduce the damages to historic structures, the economic losses, and the social disruption caused by flooding of North Gabouri Creek and South Gabouri Creek.

c. Preserve and enhance the historic character of Ste. Genevieve.

d. Increase the quantity and quality of outdoor recreation opportunities in the study area.

e. Safeguard and improve the quality of the environment in the study area, including ecological and archaeological resources.

2.7 PLANNING CONSTRAINTS

The following constraints effect the degree to which the planning objectives can be fulfilled and effect the composition of the various measures and plans developed.

a. The historic character and historic setting in Ste. Genevieve are constraints on the type and magnitude of flood damage reduction measures that are appropriate from a cultural resources standpoint.

b. The historic nature of many of the flood prone buildings is a constraint on non-structural flood damage reduction measures.

c. The Corps of Engineers has established a goal of providing a high level of protection where damages from a large flood would result in a catastrophe. This goal is particularly applicable for high levees such as those being examined for Ste. Genevieve. A uniform high level of protection called Urban Design Flood protection has been provided in all the high levee/floodwall projects built for urban areas along the Mississippi River in the St. Louis District. The aforementioned goal and the practice of providing Urban Design Flood protection for urban areas act somewhat as constraints since it is considered unlikely that the

Corps of Engineers would recommend low or moderate height Mississippi River levee protection for Ste. Genevieve. It is also noted that Corps of Engineers agricultural levees in the vicinity of Ste. Genevieve provide 50-year recurrence interval protection for agricultural lands.

d. The existing local agricultural levees and Ste. Genevieve County Levee District #2 provide constraints on the location and alignment of levee alternatives for the City of Ste. Genevieve. Ste. Genevieve County Levee District #2 has taxing power and other legal rights in the Mississippi River floodplain area generally south of the sewage lagoon, see PLATE 2, and flood protection plans for the City of Ste. Genevieve must be acceptable to Levee District #2 for local sponsorship requirements to be met.

e. Karst topography and limestone mining in the study area are constraints on detention measures.

2.8 FLOOD DAMAGE REDUCTION AND RELATED MEASURES

2.8.1 Types of Measures Considered.

During the course of the Ste. Genevieve study many flood damage reduction measures were considered. The measures were subjected to a screening process that included such factors as the effect of the measure on cultural resources, costs and economic benefits, engineering

feasibility, local acceptance, hydraulics effects, level of protection, and environmental effects. Some measures were screened out relatively quickly and others were carried into the detailed design and evaluation stage.

Both structural and non-structural flood damage reduction measures were considered. Structural measures included levees; floodwalls; interior drainage features such as pump stations, gravity drains, ditching, and channel relocation; detention dams and reservoirs; diversions; channel enlargement; clearing and snagging; bridge replacement; and improvement of the hydraulic efficiency of bridges. Non-structural measures included demolition of building, relocation of buildings, floodproofing, raising the elevation of buildings, and small levees.

The Ste. Genevieve study included a preliminary examination of detention dams and reservoirs, five in the North Gabouri Creek watershed and two in the South Gabouri drainage area. The detention sites were determined to be infeasible for the following reasons: dams and reservoirs above urban areas are designed by the Corps of Engineers to be highly stable and safe and are generally very costly, foundations and seepage problems would result from Karst topography in the area, the Mississippi Lime Company mine underlies a significant part of the area, the two detention sites on tributaries of South Gabouri Creek are a long distance from the flood damage problem area, and a relatively low level

of economic and historical benefits would be expected to result from the detention sites on either stream.

Major diversions of the high flows from North and South Gabouri Creeks through tunnels to the north and south limits of the study area, respectively, could reduce flooding along these streams and reduce pumping and other interior drainage costs for some levee plans. However, major tunnel diversions were determined to be infeasible because of high costs, Karst topography, and the extensive Mississippi Lime Company mine. A channel diversion of Valle Spring Branch in the Mississippi River floodplain is included in two of the measures developed in detail. Minor channel diversions are included in some measures.

The non-structural measures found to be engineeringly feasible in the Ste. Genevieve area were demolition of structures, relocation of structures or contents, raising the first floor elevation of structures, and floodproofing commercial structures. Floodproofing of residential buildings by making the structure water tight was found to be impractical because of saturated ground, long term flooding, old foundations, and old and often frame structures. During floods basements often fill with water, or are pumped, even if the surface water is several hundred feet away from the building. The ground becomes saturated and water sometimes pours into the basements through rock foundation walls and dirt floors.

The Ste. Genevieve study developed flood damage reduction measures during two planning iterations. The measures are independent in the sense that they would provide a level of flood protection for certain areas. The first iteration measures were developed by the St. Louis District, and included reanalyses of the flood control plans developed by the Corps of Engineers in the 1970's. The second iteration measures and plans were the result of local comments on the findings of the Corps first iteration study.

2.8.2 Summary of First Iteration.

A more detailed description of the first planning iteration is contained in APPENDIX A - PLAN FORMULATION. The following sections briefly describe the measures developed and the findings of the first iteration.

a. First Iteration Measures.

Eight levee/floodwall measures were developed during the first iteration of the planning process. Each levee/floodwall was designed at three heights or levels of protection as shown below:

Height	Mississippi River Levee	Flank Levees Along Tributaries
(1)	1973 Mississippi River flood (30 year), with 3 feet of freeboard.	50-year tributary flood coincident with 1973 Mississippi River flood, with 3 feet of freeboard.
(2)	100-year Mississippi River flood, with 3 feet of freeboard	100-year tributary flood coincident with 100-year Mississippi River flood, with 3 feet of freeboard.
(3)	Urban Design Flood (UDF is comparable to 500-year flood) on Mississippi River, with 3 feet of freeboard.	Standard Project Flood (SPF) on tributary coincident with UDF on Mississippi River, with 3 feet of freeboard.

Measures 1, 2, 3 and 4 were located close in to the community and flanked the tributary streams. Measures 5, 6, 7 and 8 were located away from the town out on the Mississippi River floodplain. Measures 5 and 7 would protect the northern two-thirds of the community, and Measure 6 and 8 would protect the entire community. The levee parts of Measures 5, 6, 7 and 8 were designed for two construction techniques. In one design the levees would be constructed with impervious soil borrowed from the adjacent floodplain lands. The other design involved levee construction using material dredged from the Mississippi River and a cap of impervious soil taken from adjacent lands. Measures 5 and 7 are shown on PLATES 4 and 5 of this report. The eight levee alignments are shown on PLATES A-1 through A-8 in VOLUME THREE. These plates show the highest levee design with the dredged material construction technique.

Two nonstructural measures were developed in the first iteration. Measure 20 involved either relocation or demolition of all structures that are flooded above the first floor by the 10-year Mississippi River

flood or the 10-year flood on North or South Gabouri Creek. Measure 20 included relocation of 10 and demolition of 23 structures. Measure 21 addressed historic structures only. It involved relocation of historic buildings that would have been flooded by surface water during the April 1973 flood if no emergency levee protection had been provided. Measure 21 included relocation of 16 historic structures to flood free sites. The nonstructural measures are shown on PLATES A-9 and A-10 in VOLUME THREE.

A maximized recreation measure was also developed. The concept of Measure 15 was to include a maximum amount of recreation features that could be associated with flood damage reduction measures. These features would be scaled down later and be made compatible with a selected flood damage reduction plan.

b. Summary of Evaluation of First Iteration Measures.

The first iteration measures were evaluated on the basis of costs, economic and recreation benefits, level of protection, ecological effects, and cultural resources effects. A summary of the evaluation is given in TABLE 6.

TABLE 6

SUMMARY OF EVALUATION
OF FIRST ITERATION MEASURES

			Total First Cost[2] ($1000)	Total Annual Benefits ($1000)	Total Annual Costs ($1000)	Benefit/ Cost Ratio	Level of Protection Relative to Av. Levee[3]	Effect on Ecology (+-Scale)[4]	Effect on Cultural Resources (Type)[5]
Measure 1	30 year	Soil	6,340	27	572	.05	-	0	Type 2
Levee	100 year	Soil	7,126	31	641	.05	+	0	Type 2
	500 year	Soil	8,143	35	730	.05	+	0	Type 2
Measure 2	30 year	Soil	8,316	118	748	.16	-	0	Type 2
Levee/	100 year	Soil	9,990	199	896	.22	+	0	Type 2
Floodwall	500 year	Soil	12,228	236	1,093	.22	+	0	Type 2
Measure 3	30 year	Soil	7,566	29	680	.04	-	0	Type 2
Levee/	100 year	Soil	9,638	57	862	.07	+	0	Type 2
Floodwall	500 year	Soil	11,922	78	1,062	.07	+	0	Type 2
Measure 4	30 year	Soil	7,255	78	654	.12	-	0	Type 2
Levee/	100 year	Soil	9,319	136	835	.16	+	0	Type 2
Floodwall	500 year	Soil	12,580	163	1,121	.15	+	0	Type 2
Measure 5	30 year	Soil	12,201	133	1,046	.13	-	0	Type 1
Levee/		Soil/D.M.[1]	10,937	133	943	.14	-	0	Type 1
Floodwall	100 year	Soil	15,945	238	1,357	.18	+	0	Type 2
		Soil/D.M.	14,359	240	1,227	.20	+	0	Type 2
	500 year	Soil	18,403	292	1,563	.19	+	0	Type 2
		Soil/D.M.	17,788	297	1,513	.20	+	0	Type 2
Measure 6	30 year	Soil	17,336	148	1,482	.10	-	0	Type 1
Levee/		Soil/D.M.	15,612	150	1,341	.11	-	0	Type 1
	100 year	Soil	21,570	252	1,833	.14	+	0	Type 1
		Soil/D.M.	19,555	261	1,668	.16	+	0	Type 1
	500 year	Soil	24,993	317	2,119	.15	+	+1	Type 1
		Soil/D.M.	23,099	327	1,964	.17	+	0	Type 1
Measure 7	30 year	Soil	11,633	125	1,011	.12	-	0	Type 1
Levee/		Soil/D.M.	10,845	124	946	.13	-	0	Type 1
Floodwall	100 year	Soil	13,981	230	1,208	.19	+	0	Type 2
		Soil/D.M.	13,066	232	1,133	.20	+	0	Type 2
	500 year	Soil	16,220	287	1,395	.21	+	0	Type 2
		Soil/D.M.	15,214	290	1,313	.22	+	0	Type 2

TABLE 6 (Cont'd)

SUMMARY OF EVALUATION
OF FIRST ITERATION MEASURES

			Total First Cost 2/ ($1000)	Total Annual Benefits ($1000)	Total Annual Costs ($1000)	Benefit/ Cost Ratio	Level of Protection Relative to Av. Levee 3/	Effect on Ecology (+-Scale) 4/	Effect on Cultural Resources (Type) 5/
Measure 8 Levee/	30 year	Soil	17,965	142	1,555	.09	-	0	Type 1
		Soil/D.M.	16,223	143	1,413	.10	-	0	Type 1
	100 year	Soil	20,764	253	1,789	.14	+	0	Type 1
		Soil/D.M.	20,334	254	1,754	.14	+	0	Type 1
	500 year	Soil	23,336	315	2,005	.16	+	0	Type 1
		Soil/D.M.	22,851	318	1,965	.16	+	0	Type 1
Measure 15 Recreation			541	56	48	1.17	N/A	+1	N/A
Measure 20 Relocation (10 Structures) Demolition (23 Structures)			2,364	83	186	.45	-	0	Type 3
Measure 21 Relocation (16 Structures)			2,286	9	180	.05	-	0	Type 3
No Action			0	N/A	N/A	N/A	N/A	0	Type 3

1/ Soil/D.M. is dredged material covered with a cap of impervious soil.
2/ October 1982 price level.
3/ (-) indicates levee is lower than Federal agricultural levees and (+) indicates it is higher.
4/ (+-scale) is explained in APPENDIX F - ECOLOGICAL RESOURCES
5/ Type 1=overall beneficial effect, where measure accomplishes significant flood protection in a manner compatible with cultural resources; Type 2=overall adverse effect, where measures accomplish flood protection but directly cause adverse effect to cultural resource; Type 3=measures which directly cause adverse effect to cultural resource and/or leave numerous historic buildings susceptible to frequent floods.

As can be seen in TABLE 6, none of the first iteration flood damage reduction measures were economically justified. There was therefore no opportunity to select an economically optimum measure, and the decision on which measures to carry into the second iteration was based on level of protection, the effects of the measures on cultural resources, and public involvement.

The appropriate level of protection for the levee/floodwall measures designed to protect Ste. Genevieve from Mississippi River flooding was determined to be the Urban Design Flood (UDF) with 3 feet of freeboard. The Urban Design Flood is comparable to the 500-year flood. This decision was based in part on the established Corps of Engineers' goal of providing a high level of protection where damages from a large flood would result in a catastrophe. As was discussed in Section 2.5.1.a. of this report, past floods in Ste. Genevieve have been devastating. Still larger floods would certainly be catastrophic. The Corps of Engineers considers the goal of providing a high level of protection to be particularly appropriate for high levees/floodwalls such as those being considered for Ste. Genevieve. The Urban Design Flood is also considered to be appropriate for Ste. Genevieve because this level of protection has been provided in all the high levee/floodwall projects built for urban areas along the Mississippi River in the St. Louis District. UDF protection for Ste. Genevieve would also be significantly higher than the Federal levee protection provided for the Prairie du Rocher agricultural area across the Mississippi River.

The ecological effects of the first iteration measures were found to be minor and did not significantly influence the decision process. These effects are discussed in APPENDIX A - PLAN FORMULATION and in APPENDIX F - ECOLOGICAl RESOURCES.

The cultural resources evaluation was conducted following the regulations of the Advisory Council for Historic Preservation. A cultural resource effect assessment was conducted for each measure and the no action alternative. The no action alternative resulted in an adverse effect because it would constitute "neglect of a property resulting in deterioration or destruction." The findings of the evaluation were that two levee measures, Measures 6 and 8, had overall beneficial effects on cultural resources. These measures would protect the historic buildings from Mississippi River flooding and not have an adverse effect on the historic setting. Some flood damage reduction measures had severe adverse effects on the historic setting. Descriptions of the cultural resources evaluation can be found in APPENDIX A - PLAN FORMULATION and in APPENDIX E - CULTURAL RESOURCES.

The conclusion of the first planning iteration was to carry forward Measures 6 and 8 and the recreation measure, and conduct more detailed studies after discussions with non-Federal interests. The levees would only be examined at the Urban Design Flood level of protection. Preliminary designs showed that levee construction with dredged material and a cap of impervious soil was less expensive and required less land

than construction with only impervious soil. At the conclusion of the first planning iteration, additional work remained to be done to address headwater flooding along North and South Gabouri Creeks.

2.8.3 Summary of Second Iteration.

A more detailed description of the second planning iteration is contained in APPENDIX A - PLAN FORMULATION.

a. Second Iteration Measures.

All of the measures examined in the first iteration were presented to non-Federal interests. Ste. Genevieve elected officials and officers of Ste. Genevieve County Levee District #3, which is chartered to protect the town of Ste. Genevieve, found Measure 6 to be the most desirable levee plan. However, the officers of Ste. Genevieve County Levee District #2 asked that Measure 6 be modified so that it would have less impact on the agricultural area protected by the private Levee District #2 levee. Three modifications of the Measure 6 levee alignment were developed in the second iteration, and they were numbered Measures 9, 10 and 11. These levees are shown on PLATES A-11, A-12 and A-13 of VOLUME THREE.

The second iteration also included the development of additional structural and nonstructural measures that addressed headwater flooding

on North and South Gabouri Creeks. Five measures were developed which included such features as channel widening, bridge modifications, small levees, clearing and snagging, relocation of structures, elevating structures, and floodproofing. These five measures are shown on PLATES A-14 through A-16 of VOLUME THREE.

A modified recreation measure was also developed during the second iteration. It included facilities associated with tributary channel widening and with Mississippi River levee measures. All the recreation facilities would be located on flood control lands. The recreation measure is shown on PLATE A-17 of VOLUME THREE.

b. Summary of Evaluation of Second Iteration Measures.

The second iteration measures were evaluated on the basis of costs; economic, recreation and ecological benefits; level of protection; ecological effects; and cultural resources effects. A summary of the evaluation is given in TABLE 7.

The public involvement program and the Corps of Engineer study through the second iteration showed that all the second iteration measures had some prospect of being included in the recommended plan. Public involvement resulted in levee Measures 6 and 8 being superceded by Measures 9, 10 and 11.

TABLE 7

SUMMARY OF EVALUATION
OF SECOND ITERATION MEASURES

	Total First Cost 1/ ($1000)	Total Annual Benefits ($1000)	Total Annual Costs ($1000)	Benefit/ Cost Ratio	Level of Protection Relative to Ag. Levee	Effect on Ecology (+-scale) 3/	Effect on Cultural Resources (Type) 4/
Measure 9 Levee Mississippi	26,800	353.4	2,513	0.14	+ 2/	0	Type 1
Measure 10 Levee Mississippi	28,300	367.7	2,659	0.14	+	+1	Type 1
Measure 11 Levee Mississippi	27,000	368.6	2,540	0.15	+	+1	Type 1
Measure 12 Chan/Levee S. Gabouri	3,000	53	238	0.22	N.A.	0	Type 1
Measure 13 Chan/Levee N. Gabouri	1,550	25.3	124	0.20	N.A.	0	Type 1
Measure 16 Recreation On Tribs. & Levee	150	45.2	19	2.4	N.A.	0	N.A.
Measure 18 Clear & Snag S. Gabouri	14	3.8	2	1.9	N.A.	0	Type 3
Measure 19 Clear & Snag N. Gabouri	8	10	1.6	6.3	N.A.	0	Type 3
Measure 22 Nonstructural N. & S. Gabouri	1,100	97	88	1.10	N.A	0	Type 1

1/ October 1982 price level.
2/ (+) indicates levee is higher than Federal agricultural levees.
3/ (+- scale) is explained in APPENDIX F - ECOLOGICAL RESOURCES
4/ Type 1=overall beneficial effect, where measure accomplishes significant flood protection in a manner compatible with cultural resources; Type 2=overall adverse effect, where measures accomplish flood protection but directly cause adverse effect to cultural resource; Type 3=measures which directly cause adverse effect to cultural resource and/or leave numerous historic buildings susceptible to frequent floods.

2.9 FLOOD DAMAGE REDUCTION AND RELATED PLANS

Flood damage reduction measures were developed during the first and second iterations of the planning effort. Flood damage reduction plans were developed by combining several second iteration measures as appropriate.

2.9.1 No Corps Action Plan.

The No Corps Action Plan involves no Corps of Engineers project in Ste. Genevieve. Ste. Genevieve will continue to be flooded even though small levees have been constructed in various locations throughout the community. The town will fight future Mississippi River floods by constructing sandbag and other levees, relocating movable items, and other efforts. Some of the levees constructed during future flood emergencies will be left in place, and additional small levees will be constructed in preparation for floods.

Local efforts to control future floods on North and South Gabouri Creeks will probably include occasional channel cleanouts on both streams. Channel widening projects on the tributaries may be undertaken using Federal Community Development funds. Levees constructed along North Gabouri Creek for Mississippi River flooding will reduce damages from tributary flooding if closures are made. Over the next 100 years it is probable that several bridges over the tributary streams will be replaced with structures that are less of an impediment to flood flows.

Floodplain zoning will result in some reduction in flood damages over the next 100 years. Some buildings in the floodplain will probably become dilapidated and be taken down. Zoning ordinances will either keep the property from being redeveloped or force construction at a level where the new building is less susceptible to flooding.

Restoration will take place in some historic buildings that have not been flooded in the past but are subject to flooding from the 100 or 500 year floods. Some frequently flooded historic buildings will be abandoned, fall into disrepair, and eventually collapse, and a portion of the Nation's heritage will be forever lost. Other historic buildings will continue to be used as residences, rental property, or commercial buildings.

2.9.2 Plan 1.

Plan 1 is a combination of Measures 9, 12, 13, and 16. It includes a major urban height levee that protects Ste. Genevieve from Mississippi River flooding, an interior drainage system that includes gravity drains and a 650 cfs pump station, channel widening with gabion slope protection on the tributary streams, bridge replacements and modifications on the tributary streams, small levees along the tributaries, and recreation facilities on land purchased for flood protection projects. This plan provides 500-year protection from Mississippi River flooding, and 25-year protection on North and South Gabouri Creek with minor residual damages. Plan 1 is shown on PLATE 6.

2.9.3 Plan 2.

Plan 2 is a combination of Measures 10, 12, 13, and 16. It is similar to Plan 1 except that the urban height levee in Plan 2 is located on the south and east side of Valle Spring Branch. Since the Valle Spring Branch watershed drains into the area protected by the levee, an 800 cfs pump station is required to handle interior drainage. Larger gravity drain capacity is also required. Measure 10 was proposed by the officers of Ste. Genevieve County Levee District #2. The plan provides 500-year protection from Mississippi River flooding and 25-year protection on North and South Gabouri Creeks with minor residual damages. It protects a few more structures than Plan 1, including an historic home. Plan 2 is shown on PLATE 7.

2.9.4 Plan 3.

Plan 3 is a combination of Measures 11, 12, 13, and 16. It is similar to Plans 1 and 2 except that the urban height levee in Plan 3 is east of the Ste. Genevieve sewage lagoon and well east of Valle Spring Branch. The levee is less visible from the south part of Ste. Genevieve than the Mississippi River levees in Plans 1 or 2. The levee also protects more structures than Plan 1, including an historic home, because it ties into high ground south of Valle Spring Branch. Plan 3 includes degrading parts of the existing Levee District #2 agricultural levee to increase the area available for ponding. This increased ponding capacity

generally compensates for the additional drainage area in the Valle Spring Branch watershed, and the pump station required for Plan 3 is the same as for Plan 1, 650 cfs. Plan 3 provides the same level of protection as Plans 1 and 2. Plan 3 is shown on PLATE 8.

2.9.5 Plan 4.

Plan 4 is a combination of Measures 18 and 19, and some features of Measure 22. It includes clearing and snagging on South and North Gabouri Creeks, a small levee along North Gabouri Creek, and floodproofing the Bilt Best Window Company warehouse. All the features of Plan 4 have net tangible economic benefits in excess of costs as measured in monetary terms. The second iteration recreation measure was not included in Plan 4 because it must be implemented in association with channel widening on the tributary streams and a levee along the Mississippi River. Plan 4 is shown on PLATE 9.

2.9.6 Other Flood Damage Reduction Plans.

Other flood damage reduction plans, in addition to Plans 1 through 4, can be developed from measures from the first or second planning iterations. These measures are described in Section 2.8 of this report, in APPENDIX A - PLAN FORMULATION in VOLUME 2, and on PLATES A-1 through A-17 in VOLUME 3.

Measures 5 and 7 merit serious consideration if the objectives are to (1) provide substantial flood protection for the historic resource and the community, (2) keep costs substantially less than Plans 1, 2, or 3, and (3) have minimum adverse effects on the historic resource. Both Measures 5 and 7 include levees in the Mississippi River floodplain that protect the north and the center parts of Ste. Genevieve from Mississippi River flooding. In both cases, South Gabouri Creek is located south of the levee and does not contribute to the interior drainage and pumping requirements behind the levee. Based on preliminary designs, Measures 5 and 7 include 100 cfs and 300 cfs pump stations, respectively. Measures 5 and 7 are shown on PLATES 4 and 5 of this report.

As shown in TABLE 6, the 100-year and 500-year flood versions of Measures 5 and 7 would have adverse effects on the cultural resources in Ste. Genevieve. The major concern with these designs is the concrete floodwall in the historic area north of South Gabouri Creek. The adverse effects of the floodwall would be eliminated if an emergency sandbag or other temporary levee were substituted for the floodwall. Ground level at the location of this emergency levee is generally above the 100-year floods of both the Mississippi River and South Gabouri Creek. The emergency levee would be a maximum of three feet high for the 100-year flood version of Measures 5 and 7, and would be a continuation of freeboard to high ground. The emergency levee would be approximately seven feet high for the 500-year flood version of Measures 5 and 7. Ste. Genevieve has constructed emergency levees to this height during the flood fights in 1973, 1979, and 1982.

The major disadvantage of Measures 5 and 7 is that the area south of the levee is not protected. However, with Measure 5 or 7 in place the community could concentrate its flood fight effort in the south part of town.

2.9.7 Evaluation of Plans.

a. Fulfillment of Specific Study Area Objectives.

The degree to which each plan fulfills the specific study area objectives described earlier in this report is presented in TABLE 8.

b. Level of Protection.

Plans 1, 2 and 3 are combinations of measures, and the levels of protection provided by each plan reflect the levels of protection provided by the measures that make up the plan. Plan 4 does not significantly improve the flood protection in the Ste. Genevieve over the without project conditions. TABLE 9 shows the levels of protection provided by the plans.

TABLE 8

FULFILLMENT OF SPECIFIC STUDY AREA OBJECTIVES

FLOOD DAMAGE REDUCTION AND RELATED PLANS

Planning Objectives	No Corps Action Plan	Plan 1	Plan 2	Plan 3	Plan 4
1. Reduce damages to historic resources, economic losses, other losses caused by Mississippi River flooding.	Flood damages sustained from 5-yr flood	High Level fulfillment (500yr-UDF)	High Level fulfillment (500yr-UDF)	High Level fulfillment (500yr-UDF)	Flood damages sustained from 5-year flood
2. Reduce damages to historic resources, economic losses, Other losses caused by N. & S. Gabouri Creeks	Flood damages sustained from 2-yr flood	Partial fulfillment (Ponding-25yr) (Headwater-25yr)	Partial fulfillment (Ponding-25yr) (Headwater-25yr)	Partial fulfillment (Ponding-25yr) (Headwater-25yr)	Flood damages sustained from 2-year flood
3. Preserve and enhance historic character	Character damaged by floods & flood fight levees	Fulfills through flood protection	Fulfills through flood protection	Fulfills through flood protection	Character damaged by floods & flood fight levees
4. Increase outdoor recreation	No effect	Partial fulfillment	Partial fulfillment	Partial fulfillment	No effect
5. Safeguard and improve ecological and archeological resources	Indirect adverse effect due to flood damages to arch. resources	Minor pos. & neg. effects	Minor pos. & neg. effects	Minor pos. & neg effects	Indirect adverse effect due to flood damages to arch. resources

TABLE 9

LEVELS OF PROTECTION PROVIDED
BY FLOOD DAMAGE REDUCTION AND RELATED PLANS

	From Mississippi River Floods in Average Recurrence Interval (Years)	From North Gabouri Creek Flooding in Average Recurrence Interval (Years)	From South Gabouri Creek Flooding in Average Recurrence Interval (Years)	From Ponding Interior Drainage Assuming Miss. River is High Ave. Rec. Int. (Years)
No Corps Action Plan	2	1	1	Not Applicable
Plan 1	500 (UDF)	25 1/	25 1/	25
Plan 2	500 (UDF)	25 1/	25 1/	25
Plan 3	500 (UDF)	25 1/	25 1/	25
Plan 4	2	1	1	Not Applicable

1/ Minor residual flood damages occur during 25-year flood.

c. Costs.

Cost estimates for Plans 1, 2, 3 and 4 were developed in October 1982 dollars, and annual interest and amortization costs were determine using a 7-7/8% interest rate. Detailed information on the cost estimates is presented in APPENDIX D - DESIGN AND COST ESTIMATES. The total costs and annual costs for the plans are shown in TABLE 10.

d. Economic, Recreation and Ecological Benefits.

A summary of economic, recreation and ecological benefits resulting from Plans 1, 2, 3 and 4 is presented in TABLE 11. Additional detail on these benefits is presented in APPENDICES H, G, and F, respectively.

Economic studies included consideration of several categories of potential economic benefits, including reduction in the physical damages sustained because of flood inundation, reduction in the cost of flood fight efforts, loss of business due to flooding, intensification of economic activities if flood protection were provided, and concepts intended to account for historic value in the buildings that would receive flood protection.

Flood damage reduction benefits were used in the economic analysis, including both urban and agricultural benefits. The cost of flood fight efforts are considered in this analysis by being equated to the damages

TABLE 10

COSTS OF FLOOD DAMAGE REDUCTION AND RELATED PLANS
OCTOBER 1982 PRICE LEVEL

	Total Flood Control First Cost ($1000)	Total Recreation First Cost ($1000)	Total First Cost ($1000)	Interest During Construction ($1000)	Total Project Cost ($1000)	Annual Int & Amort @ 7-7/8% ($1000)	Annual Operation & Maint. ($1000)	Annual Replacement Cost ($1000)	Total Annual Cost ($1000)
No Corps Action Plan	0	0	0	0	0	0	0	0	0
Plan 1	31,350	150	31,500	6,005	37,505	2,955	74	5	3,034
Plan 2	32,850	150	33,000	6,323	39,323	3,098	83	6	3,187
Plan 3	31,550	150	31,700	6,092	37,792	2,978	83	5	3,066
Plan 4	410	0	410	0	410	32	3	0.3	35

TABLE 11

ECONOMIC, RECREATION AND ECOLOGICAL BENEFITS
FROM FLOOD DAMAGE REDUCTION AND RELATED PLANS

	Annual Urban Benefits ($1000)	Annual Agricultural Benefits ($1000)	Annual Recreation Benefits ($1000)	Annual Ecological Benefits ($1000)	Total Annual Benefits ($1000)
No Corps Action Plan	0	0	0	0	0
Plan 1	448.0	4.3	45.2	9.0	506.5
Plan 2	460.2	4.0	45.2	10.6	520.0
Plan 3	460.2	3.0	45.2	12.3	520.7
Plan 4	49.2	0	0	0	49.2

which would have occurred to those structures which are protected by flood fight efforts. Cleanup, police, fire, medical and other costs to the community are included in the analysis in miscellaneous damage computations.

Losses of business in the flooded area were considered to be equal to gains in business for non-floodplain concerns. Therefore there was no change in net business activity.

Any benefits relating to intensification of economic activities if flood protection were provided would be tied to the recreational opportunities made possible by protecting the historic buildings. If a plan were developed that utilized the unique historic resource in Ste. Genevieve and intensified the development of a historic district that included enhancement of the historic homes coupled with perhaps an amusement park and accommodations for large numbers of visitors, then a benefit category would be developed for these factors. The existence of some general plan with a valid sponsor with the ability to finance and acquire land and to develop the necessary facilities would be required. It is recognized that certain homes may in fact be restored and developed as a matter of course. No indication can be found, however, that would point to large scale development. Therefore, in the absence of adequate indication that the above will take place, and considering the relatively small benefits that could be derived from this benefit category, these benefits were not developed.

Concepts intended to account for historic value, such as use of "replication values" rather than market values in determining damages, were not used because the District believes that no price can adequately reflect historic worth. Traditional economics procedures were used, with the understanding that they do not capture any of the historic value of the buildings.

e. Cultural Resources Effects.

Plans 1, 2, and 3 protect historic buildings and archaeological sites from Mississippi River and North and South Gabouri Creek flooding. Either a No Corps Action Plan or Plan 4 would fail to protect cultural resources from flood damage. Therefore, the No Corps Action Plan and Plan 4 both constitute neglect that may result in the deterioration or destruction of the Ste. Genevieve National Register property, and both would, by definition, have an adverse effect on the property (36 CFR 800.9 (e)).

A summary of the cultural resources effects of the plans is presented in TABLE 12. Additional detail in presented in APPENDIX E - CULTURAL RESOURCES.

f. Ecological Effects.

A summary of the ecological effects of the plans is presented in TABLE 13. Additional detail is presented in APPENDIX F - ECOLOGICAL RESOURCES.

g. Completeness.

Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects.

Plans 1, 2 and 3 are complete except that normal operations, maintenance and replacements are needed, and other private and public funds will be required to restore historic buildings in Ste. Genevieve. Plan 4 is not complete because actions and investments would be required to maintain a cleared and snagged condition on the tributary streams, maintain and operate floodproofing features, and maintain and restore the small levee.

TABLE 12

SUMMARY OF EFFECTS ON CULTURAL RESOURCES
FLOOD DAMAGE REDUCTION AND RELATED PLANS

	No Corps Action Plan	Plan 1	Plan 2	Plan 3	Plan 4
Surviving historic historic buildings	Damages sustained from 5-year Mississippi River and 2-year tributary floods.	Protects all but one from UDF. Adversely effects none. High likelihood of indirect beneficial effect.	Same as Plan 1, but provides complete UDF protection.	Same as Plan 2.	Same as No Corps Action Plan.
Spatial, chronological and architectural associations of historic district	Indirect adverse effect through flood-caused attrition.	No adverse effect. Beneficial effect results from flood protection.	Same as Plan 1.	Same as Plan 1.	Same as No Corps Action Plan.
Visual and aesthetic character	No direct effect.	No adverse effect. Flood protection highly likely to provide beneficial effect.	Same as Plan 1.	Same as Plan 1.	Same as No Corps Action Plan.
Distinctive characteristics of historic buildings	Damages sustained from 5-year Miss. and 2-year tributary floods.	Opportunities for restoration, rehabilitation enhanced.	Same as Plan 1.	Same as Plan 1.	Same as No Corps Action Plan.
Community significance	No direct effect.	Opportunities for in-place preservation enhanced.	Same as Plan 1.	Same as Plan 1.	Same as No Corps Action Plan.
Archaeological resources	Indirect adverse effect through flood damage.	Moderately likely to affect archaeologicals sites.	Same as Plan 1, though effect more likely.	Same as Plan 2.	Same as No Corps Action Plan.

TABLE 13

SUMMARY OF ECOLOGICAL IMPACTS
FLOOD DAMAGE REDUCTION AND RELATED PLANS

Ecological Resource	No Corps Action Plan	Plan 1	Plan 2	Plan 3	Plan 4
Prime Farmland	Continued periodic flooding 595 acres	Loss of 76.0 ac. Protection of 385 ac.	Loss of 89.3 ac. 421 acres protected	Loss of 89.7 ac. 575 ac. protected	NSI
Wetlands	NSI	Increase of 79 acres	Increase of 93 acres	Increase of 108 acres	NSI
Groundwater	NSI	NSI	NSI	NSI	NSI
Water Quality	Continued degradation of South Gabouri Creek from lime mine discharges.	Minor, temporary decrease	Minor, temporary decrease	Minor, temporary decrease	Minor, temporary decrease
Endangered Species	NSI	Loss of 6255 feet of low quality potential Indiana bat summer habitat. Minor increase for 2 state listed plants.	Loss of 3736 feet of low quality potential Indiana bat summer habitat. Minor increase for 2 state listed plants.	Loss of 3346 feet of low quality potential Indiana bat summer habitat. Minor increase for 2 state listed plants.	Degradation of 4382 feet of low quality potential Indiana bat summer habitat.
Floodplain Forest	NSI	Minor decrease	NSI	Minor decrease	NSI
Aquatic Resources	NSI	1.83 miles of tributary streams degraded	1.83 miles of tributary streams degraded	1.83 miles of tributary stream degraded	0.83 miles of tributary streams degraded
Terrestrial Resources	NSI	Moderate beneficial impact for wetland species; minor loss of riparian habitat (6255 feet).	Moderate beneficial impact for wetland species; minor loss of riparian habitat (3736 feet)	Moderate beneficial impact for wetland species; minor loss of riparian habitat (3346 feet)	NSI
Aesthetics	NSI	Improvement because flood fight no longer necessary, buildings not damaged, neighborhood renewal.	Improvement because flood fight no longer necessary, buildings not damaged, neighborhood renewal.	Improvement because flood fight no longer necessary, buildings not damaged, neighborhood renewal.	NSI
Sewage Lagoons	NSI	NSI	NSI	Flood protection provided.	NSI
Water Wells	NSI	Flood protection provided.	Flood protection provided.	Flood protection provided.	NSI

h. Effectiveness.

Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities. The effectiveness of each plan is described in TABLE 8.

i. Efficiency.

Efficiency is the extent to which an alternative plan is the most cost effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment. Costs of the plans are described in detail in APPENDIX D - DESIGN AND COST ESTIMATES, and are summarized in TABLE 10.

Plans 1 and 3 are similar in cost, and are both efficient because they both provide a high level of flood protection for the historic resources in Ste. Genevieve while not adversely affecting the historic setting. Plan 3 costs slightly more than Plan 1, but it protects one additional important historic structure and is less visible from the south part of Ste. Genevieve. Plan 4 is cost effective but it cannot be considered efficient because it does not significantly alleviate the specified problems or realize the specified opportunities in the study area.

j. Acceptability

Plan 1 is the most acceptable plan. It is the plan desired by the City of Ste. Genevieve and the Ste. Genevieve County Levee District #3. There is no known opposition to Plan 1.

Plan 2 is less acceptable to the City and Levee District #3 because it has higher initial pump station costs and higher pumping operation and maintenance costs than Plan 1.

Plan 3 is less acceptable to the City and Levee District #3 because of higher operation and maintenance costs than Plan 1.

Plan 4 is not acceptable to the City or Levee District #3 or to historical interests.

k. Assessment and Appraisal of Effects.

Assessment is the process of measuring or estimating the effects of an alternative plan. Assessment determines the difference between without-plan and with-plan conditions. Appraisal is the process of assigning social values to the technical information gathered as part of the assessment process. The assessment and appraisal of the effects of the No Corps Action Plan, Plan 1, Plan 2, Plan 3 and Plan 4 are presented

in a System of Accounts in APPENDIX A - PLAN FORMULATION. A summary of the most important parts of the evaluation of the final plans is presented in TABLE 14.

2.9.8 National Economic Development Plan.

The National Economic Development Plan (NED Plan) is the plan that reasonably maximizes net national economic development benefits, consistent with the Federal objective. The Federal objective of water and related land resources project planning is to contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders and other Federal planning requirements.

The Ste. Genevieve, Missouri study examined many types and increments of flood damage reduction measures designed to protect the community from Mississippi River flooding, tributary flooding, or both. Of all the flood damage reduction measures examined, the only measures that had net NED benefits were clearing and snagging on South and North Gabouri Creeks (Measures 18 and 19), the small levee along North Gabouri Creek (part of Measure 22), and the floodproofing of the Bilt Best Window Company warehouse (part of Measure 22). Plan 4 is a combination of these measures and features and is the Nation Economic Development Plan (NED Plan).

TABLE 14

SUMMARY OF EVALUATION
FLOOD DAMAGE REDUCTION AND RELATED PLANS

	Total Annual Benefits ($1000)	Total Annual Costs ($1000)	Benefit/ Cost Ratio	Level of Protection	Effect on Ecology	Effect on Cultural Resources
No Corps Action Plan	0	0	N.A.	No protection provided. Urban damages from 5-year Mississippi River flood, 2-year North & South Gabouri Creeks.	None	Continued damages to unique historical resources, and impediment to restoration. Adverse effect due to neglect.
Plan 1	506.5	3034	0.17	500-year Mississippi River, 25-year ponding, 25-year North Gabouri, 25-year South Gabouri.	No significant impacts.	Major flood protection for unique historical resources, removal of impediment to restoration.
Plan 2	520.0	3187	0.16	500-year Mississippi River, 25-year ponding, 25-year North Gabouri, 25-year South Gabouri.	No significant impacts.	Major flood protection for unique historical resources, removal of impediment to restoration. Plus protects one additional historic building.
Plan 3	520.7	3066	0.17	500-year Mississippi River, 25-year ponding, 25-year North Gabouri, 225-year South Gabouri.	Minor net beneficial effect.	Major flood protection for unique historical resources, removal of impediment to restoration. Plus protects one additional historic building.
Plan 4	49.2	35	1.40	Same as No Corps Action Plan	Minor net adverse effect.	Same as No Corps Action Plan

2.9.9 Environmental Quality Plan.

The environmental quality plan (EQ plan) is the same as Plan 3. It was formulated under the following criteria, listed in priority:

a. Maximize benefits to cultural (historic) resources.

b. Include opportunities for other environmental resources as feasible.

c. Include opportunities for recreation as feasible.

Additional discussion on the environmental features in the measures in the EQ plan is presented below.

a. Measure 11 - This levee protects all the historic structures and is less visible from the south part of Ste. Genevieve than Measures 9 and 10. It also protects the sewage lagoon. Borrow areas used to construct the levee would be converted to marshes. Levees would be mowed after 1 August to avoid destruction of ground nesting wildlife.

b. Measure 12 and 13 - These measures consist of widening portions of North and South Gabouri Creeks to reduce flooding to historic structures from these creeks. The channels would be widened from one side only to preserve the riparian vegetation on the opposite bank.

Riparian forest would be cleared between 15 October and 1 April to avoid potential impacts to Indiana bat nursery colonies (also applies to Measure 11).

c. Measure 16 - Hiking and bicycling trails would be constructed along North and South Gabouri Creeks and on the levee.

d. General conditions for all measures - Land purchased for project purposes would be developed for recreation and/or environmental purposes as appropriate.

2.9.10 Selection of the Final Plan and Justification of Departure from the NED Plan.

The District Engineer of the St. Louis District, Corps of Engineers selected Plan 1 as the best plan to reduce flood damages and provide related benefits in Ste. Genevieve, Missouri. The City of Ste. Genevieve and Ste. Genevieve County Levee District #3 have stated their intent to act as the non-Federal co-sponsor for Plan 1.

Under the Water Resource Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, the NED Plan is to be selected unless there is an overriding reason for selecting another plan, based on other Federal, state, local, and international concerns.

The NED plan was not selected because it is so small in scale that it does not meet the planning objectives. The economic and environmental benefits provided by the plan are insignificant when compared to the flooding problems in Ste. Genevieve and the debilitating effects of continued flooding on the unique historical resources in the community.

Flood damages are still experienced along both North and South Gabouri Creeks with the NED plan in place, in fact damages are still sustained along both streams from the 2-year flood. The historic buildings along North and South Gabouri Creeks are still highly susceptible to tributary headwater flooding with the NED plan in place. As an example, the French colonial Robert house, built in 1797, is still damaged by the 2-year North Gabouri Creek flood. Higher floods on the tributaries will damage many structures and historical buildings with the NED plan in place.

The NED plan provides only incidental protection from the most important flood problem in Ste. Genevieve, the disastrous Mississippi River floods. The extent, depths and durations of the Mississippi River floods far exceed those on the tributary streams. As has been discussed at length in this report, Mississippi River floods cause major economic damages, tremendous social disruption, and irreparable damage to the unique internationally significant historical buildings in Ste. Genevieve. Mississippi River flooding is the primary reason why the community is seeking Federal help in solving their flood problem, and the NED plan is unable to properly address this key objective.

The exception to the requirement to select the NED plan is further justified by the fact that flooding of the historical buildings in Ste. Genevieve is a matter of local, state, National, and international concern. The National Trust for Historic Preservation and the United States Department of the Interior are very concerned about the flood problem and have supported Federal flood protection for the community. Both the French and Canadian consulates have expressed concern about the effects of flooding on the French and French Canadian heritage in Ste. Genevieve.

Plan 1 was selected rather than Plan 2 because Plan 2 is more costly due to the larger pump station required to handle the additional flows from the Valle Spring Branch watershed. Plan 2 also has higher annual pump operation, maintenance, and replacement costs.

Although Plan 3 is an attractive plan from the environmental quality standpoint, Plan 1 was selected rather than Plan 3 because Plan 3 has higher operation and maintenance costs and because Plan 3 was not supported by Levee District #2.

SECTION 3 - DESCRIPTION OF THE SELECTED PLAN

3.1 PLAN COMPONENTS

The selected plan, Plan 1, has the following components:

a. A major urban height levee that protects Ste. Genevieve from Mississippi River floods.

b. An interior drainage system that includes ditches, gravity drains and a 650 cfs pump station. This interior drainage system is designed to handle flows from North and South Gabouri Creeks and from additional drainage areas behind the Mississippi River levee.

c. Channel widening on South and North Gabouri Creeks; six bridge replacements, one bridge removal and two bridge modifications; and two small levees that protect areas from tributary flooding.

d. Recreation features such as trails, ball diamonds and picnic tables provided on lands purchased for the flood protection projects.

Plan 1 is shown on PLATE 6 and is described in more detail in the Plan 1 and the Second Iteration sections of this report, and in APPENDICES A, C, and D.

3.2 MITIGATION

Plan 1 includes no mitigation features. No mitigation has been found necessary by the Corps of Engineers. The U.S. Fish and Wildlife Service has indicated that mitigation may be needed in association with channel widening projects on North and South Gabouri Creeks.

3.3 DESIGN AND CONSTRUCTION CONSIDERATIONS

The urban height Mississippi River levee includes both stability and seepage berms. The levee and berms are constructed with material dredged from the Mississippi River and a cap of impervious soil taken from the floodplain on the river side of the levee. Preliminary studies have shown that there is adequate material in the Mississippi River and in the floodplain for this type of construction. However, additional field data is required to determine the location, quantity and engineering properties of both the impervious soils and the material to be dredged from the Mississippi River. Typical cross sections of the urban height levee and the tributary channel widening in Plan 1 are shown on PLATES 10 and 11, respectively.

3.4 OPERATION AND MAINTENANCE CONSIDERATIONS

The most important operation and maintenance consideration is for the local sponsor to keep the interior drainage system in excellent working order. Drainage ditches and gravity drains must be kept clear, and the pump station must be inspected and tested regularly.

3.5 PLAN ACCOMPLISHMENTS

Plan 1 accomplishes a high level of protection from Mississippi River floods while providing a reasonable level of protection from ponding due to interior drainage behind the levee and from headwater flooding along North and South Gabouri Creeks. A period-of-record analysis using actual flood heights on the Mississippi and rainfall data representative of the area show that, if the project had been in place since 1939 the levee would have protected the community and the pump station would have handled interior floods so that ponding would not have damaged developed areas. Millions of dollars in flood damages and great deal of suffering would have been avoided. The plan protects the historic resources in Ste. Genevieve but does not adversely effect the historic character of the community. The plan also fills some of the recreation needs in the area. Additional discussion on plan accomplishments can be found in the Evaluation of Plans section of this report.

3.6 SUMMARY OF ECONOMIC, ENVIRONMENTAL, AND OTHER SOCIAL EFFECTS

The annual economic benefits resulting from the selected plan are $452,300. These together with $45,200 annual recreation benefits and $9,000 annual ecological benefits add to a total of $506,500 annual benefits resulting from the project.

The first cost of the project in October 1982 dollars is $31,500,000, which using traditional cost sharing includes $29,100,000 in Federal costs and $2,400,000 in non-Federal costs. The annual costs include $2,955,000 for interest and amortization at 7 7/8 percent, $74,000 for operation and maintenance, and $5,000 for major replacements, totaling to $3,034,000.

The project has negative net annual benefits equal to $-2,527,500, and has a benefit to cost ratio of 0.17.

The environmental effects of the selected plan include effects on the ecology and effects on cultural resources. The effects on the ecology are rather minor, and for this project are not nearly as important as the effects on cultural resources. Some minor negative effects on stream habitat and open lands are more than balanced by creation of marsh habitat in the borrow areas for the major levee, and this results in net ecological benefits as shown above.

The project has major and unique cultural resources benefits. It protects 86 historical structures from Mississippi River floods. It also reduces the flood susceptibility of 53 historical structures from flooding on North and South Gabouri Creeks. This flood protection is provided by a project that does not adversely effect the historic character of the community. With the flood protection system in place, the historical resources will be enhanced through increased restoration of individual historic buildings and through improvements to the historic setting, for example, sandbag levees would be removed and community maintenance would improve.

The major social effects of the selected plan include increased local taxes, major reductions in the personal suffering and community losses that accompany the flooding and the normal flood fight efforts, and improved community life resulting from better utilization of the historic resources.

3.7 COMPLIANCE WITH EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

The selected plan was formulated in recognition of Executive Order 11988 which was enacted "in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." Construction of flood control measures in the floodplains was determined

to be the best means of reducing flood damages to the historical resources in Ste. Genevieve and minimizing the impacts of flooding on human safety, health and welfare. Future development behind the Mississippi River levee would be restricted by the fact that ponding would take place behind the levee.

SECTION 4 - SUMMARY OF COORDINATION, PUBLIC VIEWS AND COMMENTS

Since the Ste. Genevieve study was initiated in October 1973, many meetings have been held and a great deal of coordination has taken place with Federal, state and local interests. The initial Public Meeting was held in Ste. Genevieve on 7 June 1974. A public information meeting was held on 5 July 1979.

After the Board of Engineers for Rivers and Harbors review of the Ste. Genevieve Report in July 1980, many additional coordination meetings were held. The District briefed the Honorary French Consul in St. Louis on 19 November 1982. Meetings were held with elected City officials, Levee District #3 officials, Levee District #2 officials, and the Foundation for the Restoration of Ste. Genevieve on 30 November 1982, 7 December 1982, 11 January 1983, and 31 May 1983. The Corps discussed plans for Ste. Genevieve with the Foundation for the Restoration of Ste. Genevieve, the University of Missouri historical research group, the Missouri Department of Natural Resources, the Missouri Heritage Trust, and Ste. Genevieve County elected officials on 16 March 1983. The District Engineer was the main speaker at the Ste. Genevieve Chamber of

Commerce annual dinner on 7 April 1983, and he described the flooding problem and flood protection plans to more than 150 people.

A letter from the City of Ste. Genevieve and Ste. Genevieve County Levee District #3 dated 6 June 1983 states their intent to act as the non-Federal co-sponsor for Plan 1 as presented in this report. This letter is presented in the PUBLIC VIEWS AND RESPONSES section of this report.

Letters from the United States Department of the Interior dated 27 June 1978, 17 July 1978, 13 March 1979 and 18 May 1984 support Corps of Engineers construction of flood protection for Ste. Genevieve. These letters are also presented in the PUBLIC VIEWS AND RESPONSES section of this report.

Additional coordination with the public was accomplished through dissemination of a draft Feasibility Report dated March 1984 and the final Public Meeting held in Ste. Genevieve on 24 April 1984. A summary of the final Public Meeting and copies of the letters commenting on the draft report are included in the PUBLIC VIEWS AND RESPONSES section of this report. Many appeals for either the Corps to change its finding or for special consideration to be given to Ste. Genevieve were received. Of special note are letters from the Consulat General de France, the Office of the Secretary of the Interior, and Advisory Council on Historic Preservation, and the National Trust for Historic Preservation.

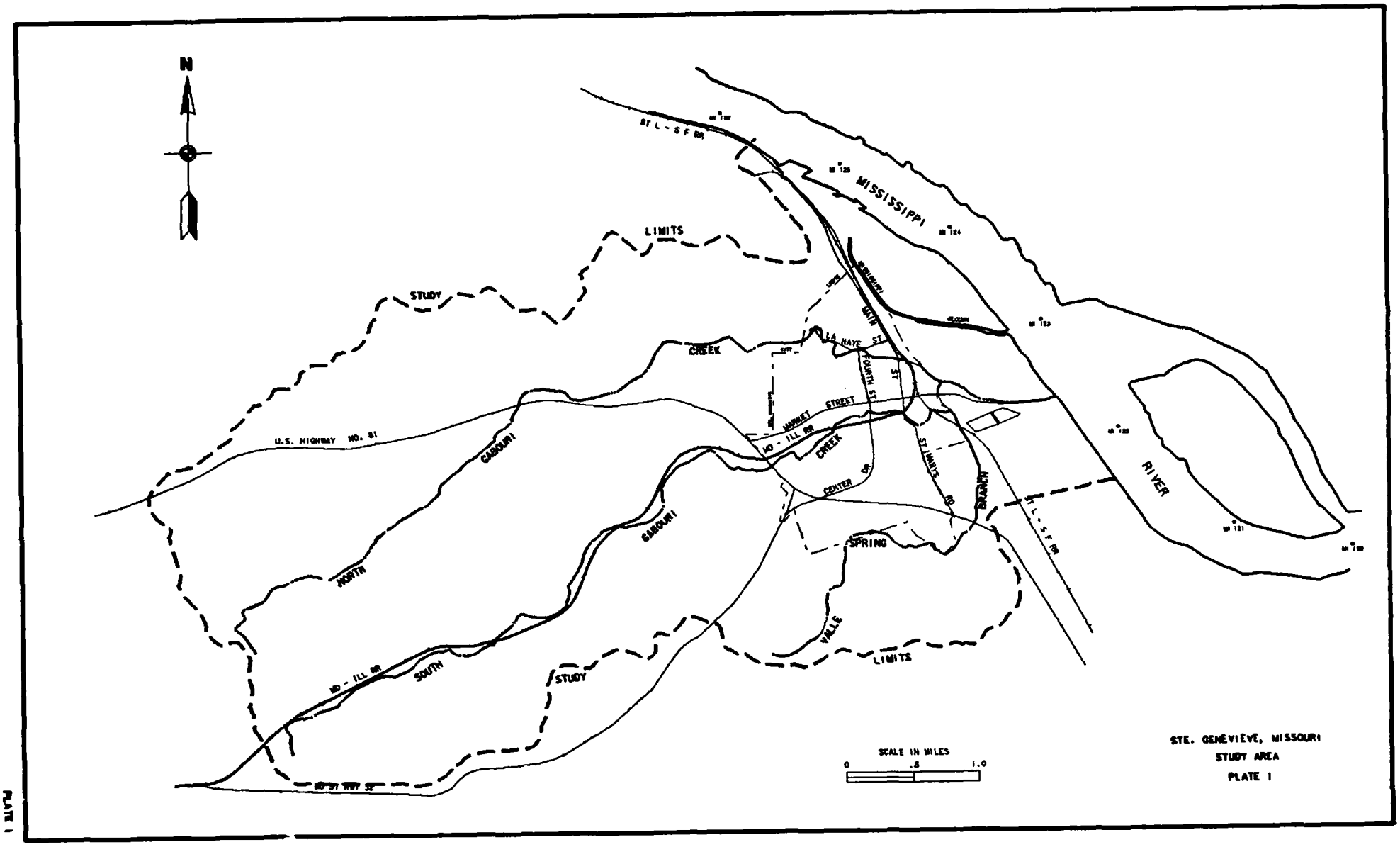
SECTION 5 - RECOMMENDATIONS

I have carefully considered many significant factors related to the flooding problems and associated opportunities in Ste. Genevieve, Missouri, and the alternative plans that address these problems and opportunities. These factors include: the unique historical resources in Ste. Genevieve: the concerns of local, state, National and international interests that these historical resources be protected from flooding; the economic and social damages caused by repeated flooding in Ste. Genevieve; the probability of higher flooding in the future; the objective of protecting the community from both Mississippi River and tributary flooding while not adversely affecting the historic buildings or the historic character of the community; the goal of providing a high level of flood protection for this urban community; the effectiveness of the alternative measures and plans in reducing the flood potential and meeting other planning objectives; the costs of the measures and plans and their economic benefits; and the acceptability of the plans to the local sponsor and other interests.

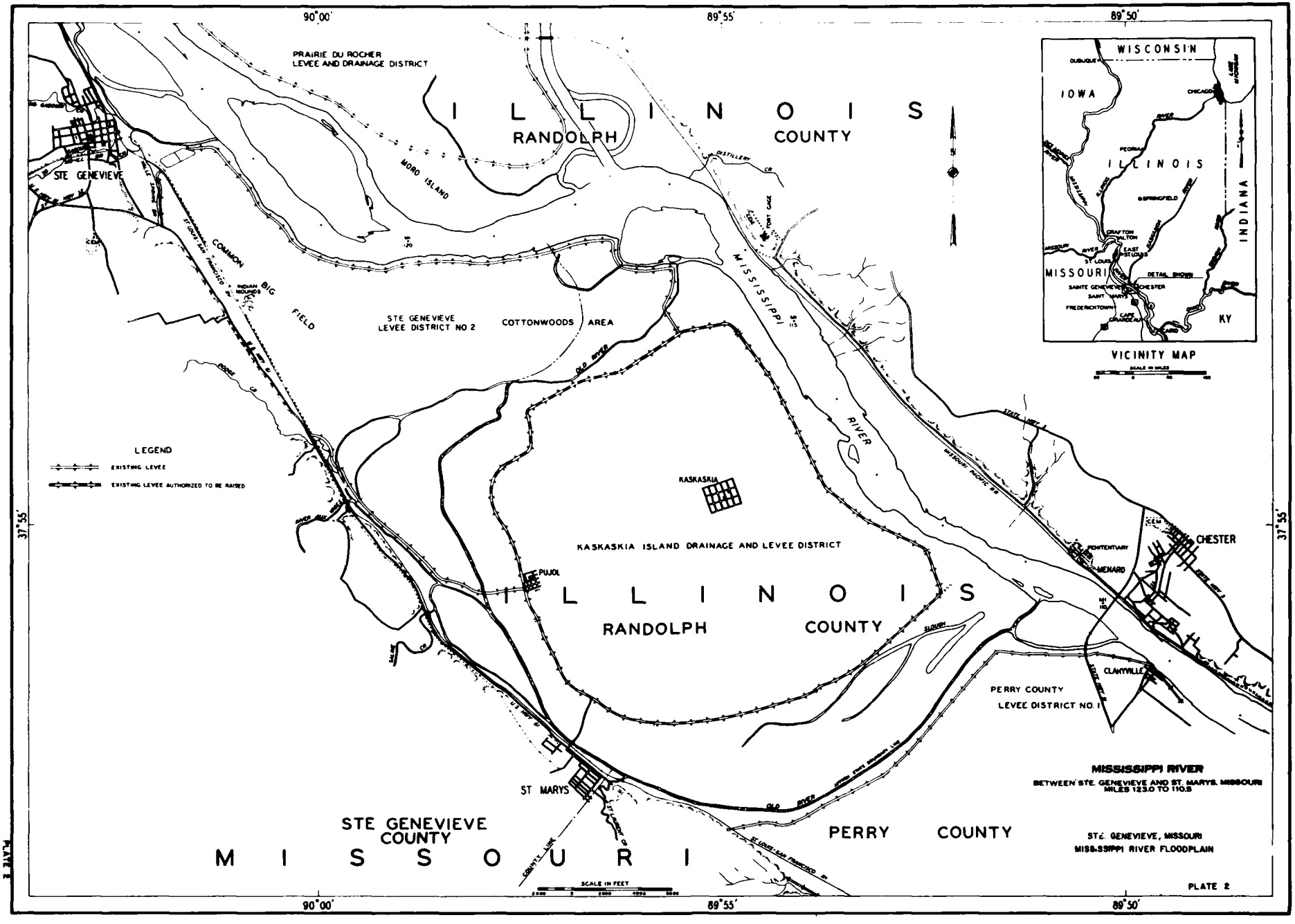
Plan 1 is the comprehensive plan that best satisfies the objectives of this study. Measures 5 and 7 are less comprehensive but still substantial alternatives that merit consideration. However, all of these plans have been found to be economically unjustified. I find at this time that no Federal action by the Corps of Engineers is warranted when examined under National Economic Development (NED) criteria.

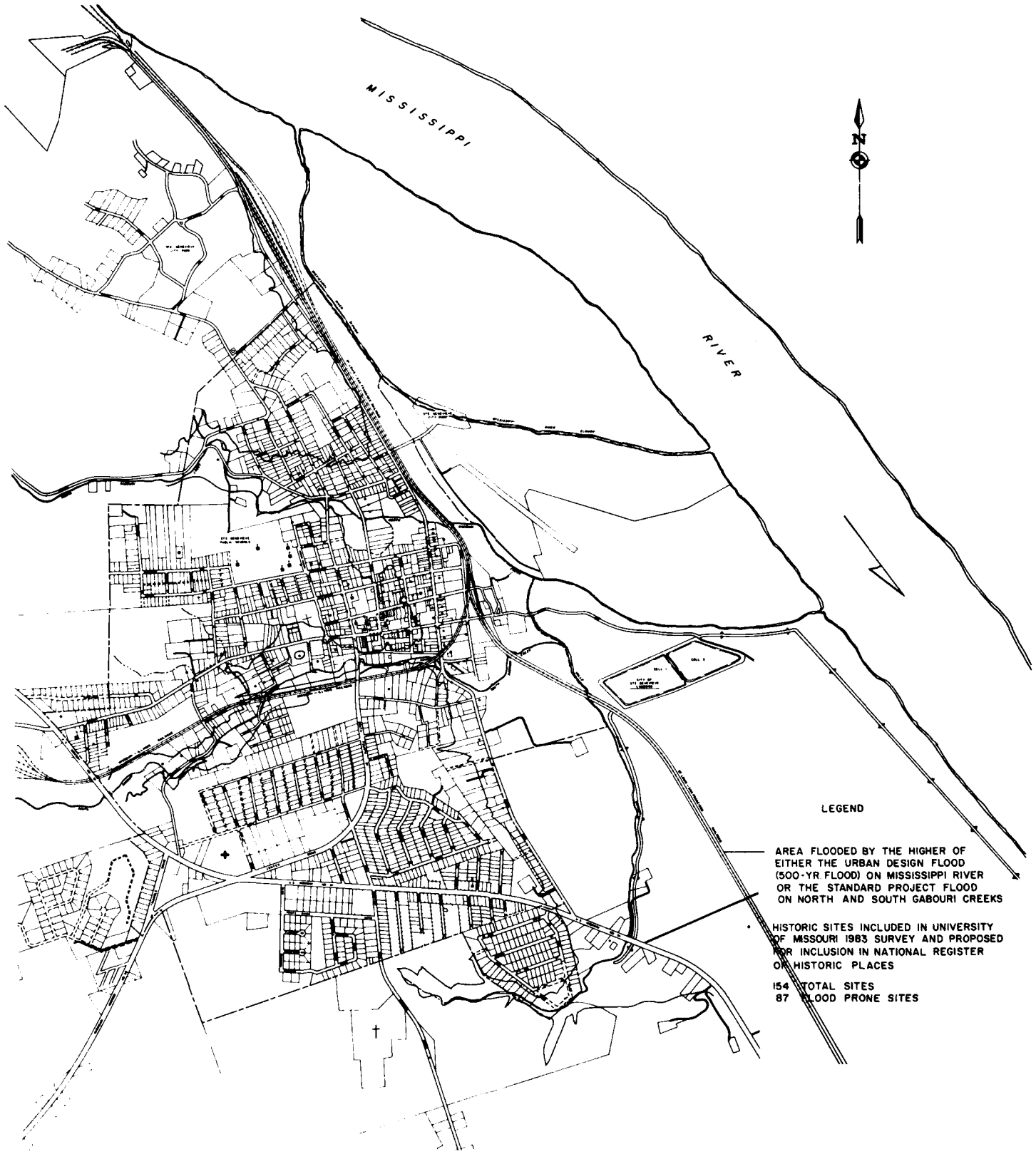
Historic preservation in Ste. Genevieve is in the Federal interest, and substantial flood protection has been found to be a necessary part of any general effort to protect and enhance the historic resource in the community. Other Federal and non-Federal agencies are encouraged to preserve the historic resource in Ste. Genevieve, and to provide flood protection for the community so that the expected continued deterioration of the historic resource due to flooding can be prevented.

GARY D. BEECH
Colonel, Corps of Engineers
District Engineer



STE. GENEVIEVE, MISSOURI
STUDY AREA
PLATE 1


90°00'
89°55'
89°50'
37°55'
PRAIRIE DU ROCHER
LEVEE AND DRAINAGE DISTRICT
I L L I N O I S
RANDOLPH COUNTY
MORO ISLAND
STE GENEVIEVE
COMMON BIG FIELD
INDIAN MOUNDS
STE GENEVIEVE
LEVEE DISTRICT NO 2
COTTONWOODS AREA
MISSISSIPPI RIVER
KASKASKIA
KASKASKIA ISLAND DRAINAGE AND LEVEE DISTRICT
PUJOL
I L L I N O I S
RANDOLPH COUNTY
ST MARYS
STE GENEVIEVE
COUNTY
M I S S O U R I
PERRY COUNTY
PERRY COUNTY
LEVEE DISTRICT NO. 1
CLAYVILLE
MENARD
CHESTER
LEGEND
EXISTING LEVEE
EXISTING LEVEE AUTHORIZED TO BE RAISED
SCALE IN FEET
WISCONSIN
IOWA
ILLINOIS
INDIANA
MISSOURI
KY
VICINITY MAP
MISSISSIPPI RIVER
BETWEEN STE. GENEVIEVE AND ST. MARYS, MISSOURI
MILES 123.0 TO 110.8
STE. GENEVIEVE, MISSOURI
MISSISSIPPI RIVER FLOODPLAIN
PLATE 2



STE. GENEVIEVE, MISSOURI
HISTORIC STRUCTURES

400 0 800 1600
SCALE IN FEET

STE GENEVIEVE, MISSOURI
MEASURE 5

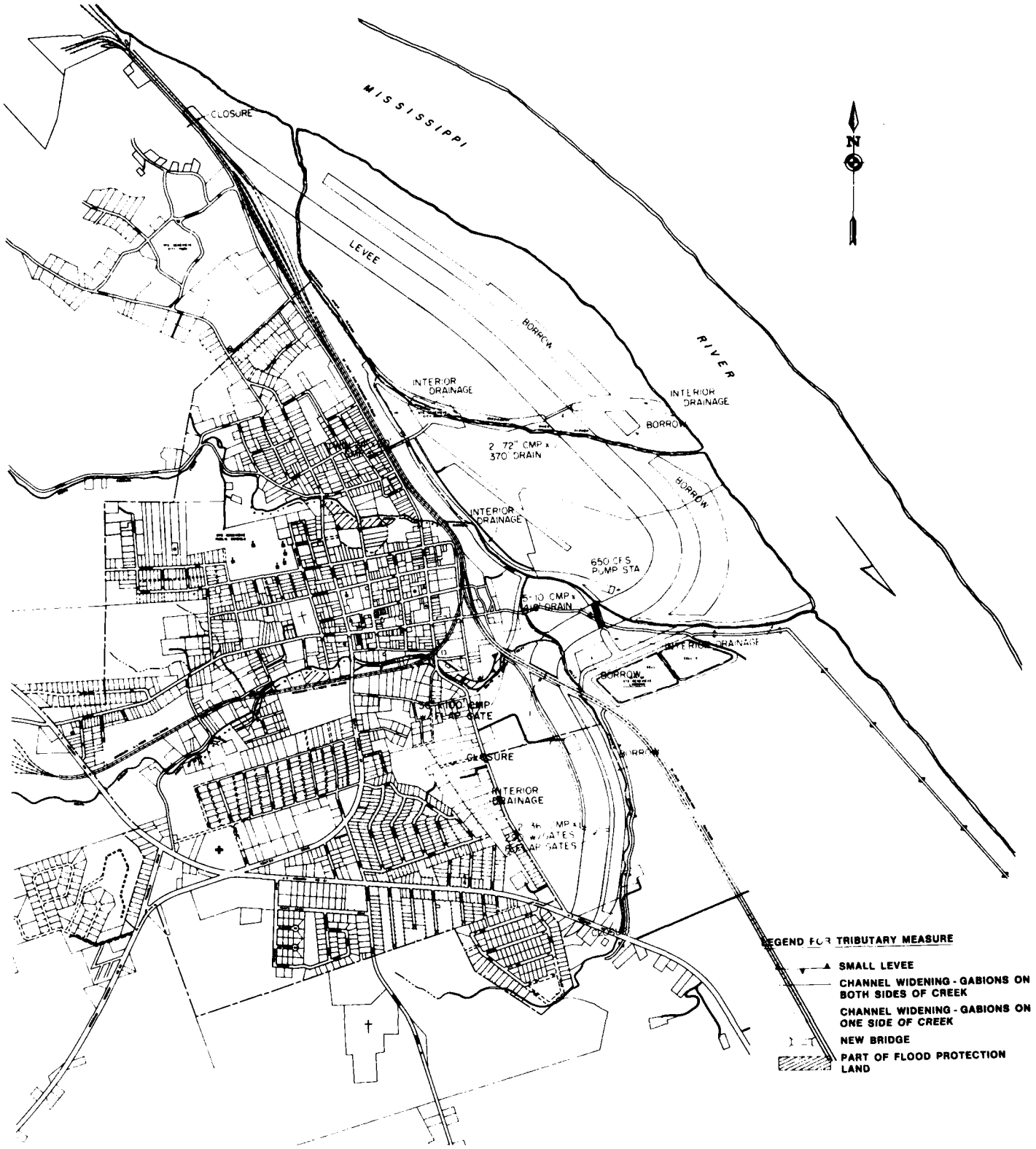
400 0 800 1600
SCALE IN FEET

PLATE 4

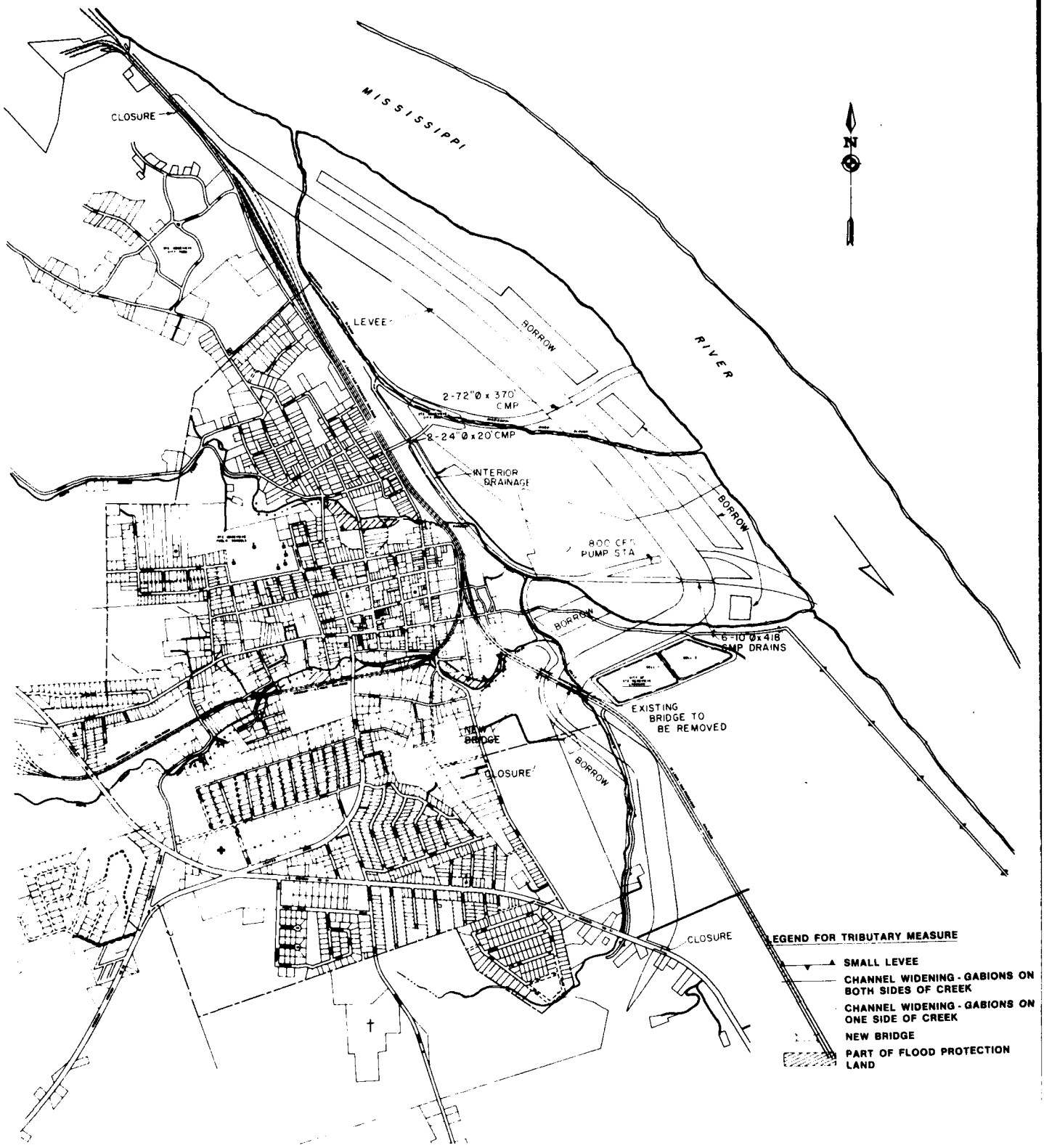
STE GENEVIEVE, MISSOURI
MEASURE 7

400 0 800 1600
SCALE IN FEET

PLATE 5



STE. GENEVIEVE, MISSOURI
PLAN 1 (RECREATION FACILITIES NOT SHOWN)



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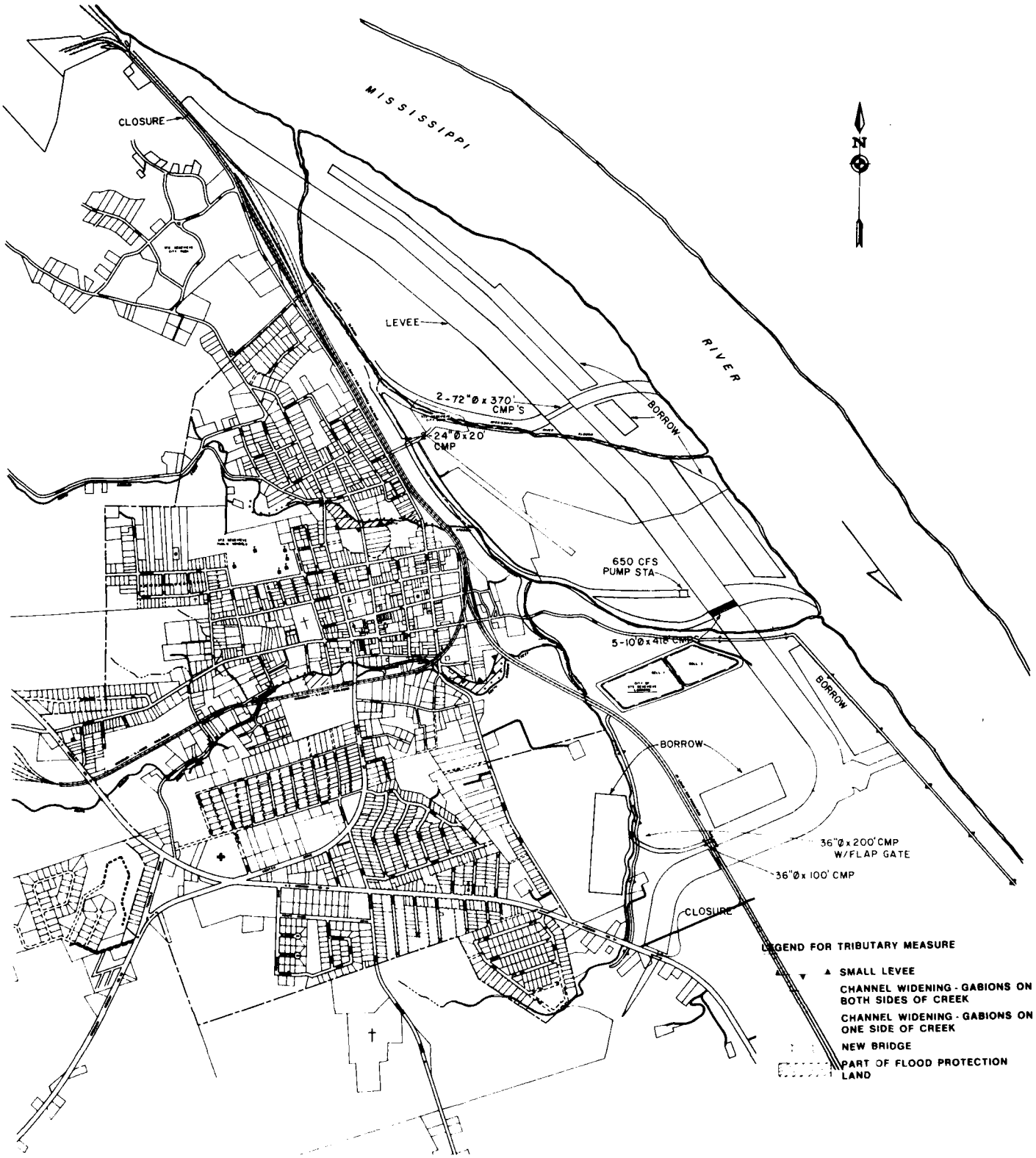
SCALE IN FEET

STE. GENEVIEVE, MISSOURI
PLAN 2 (RECREATION FACILITIES NOT SHOWN)



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SCALE IN FEET

STE. GENEVIEVE, MISSOURI
PLAN 3 (RECREATION FACILITIES NOT SHOWN)

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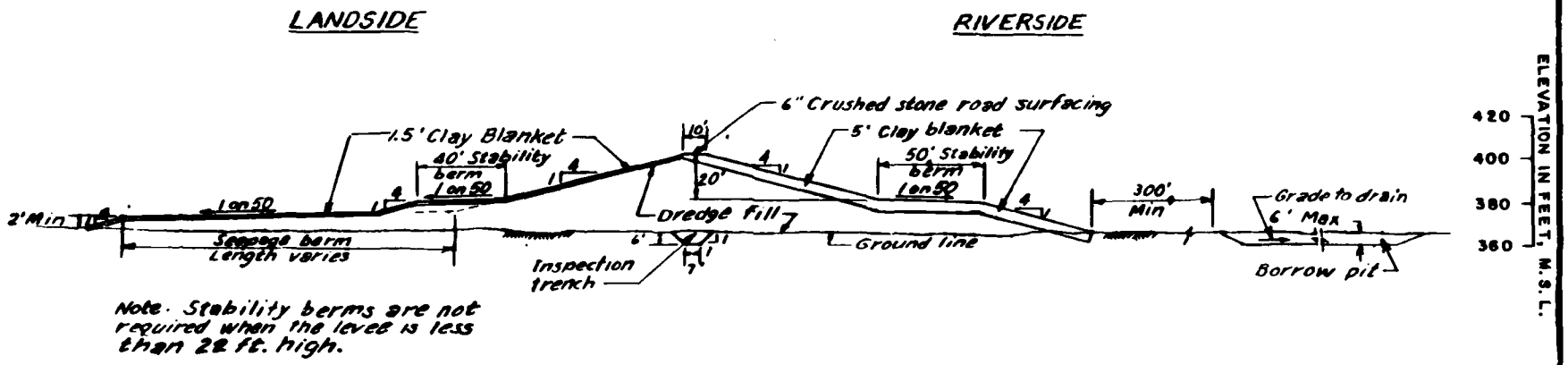
SCALE IN FEET

STE. GENEVIEVE, MISSOURI
PLAN 4



Note. Stability berms are not required when the levee is less than 22 ft. high.

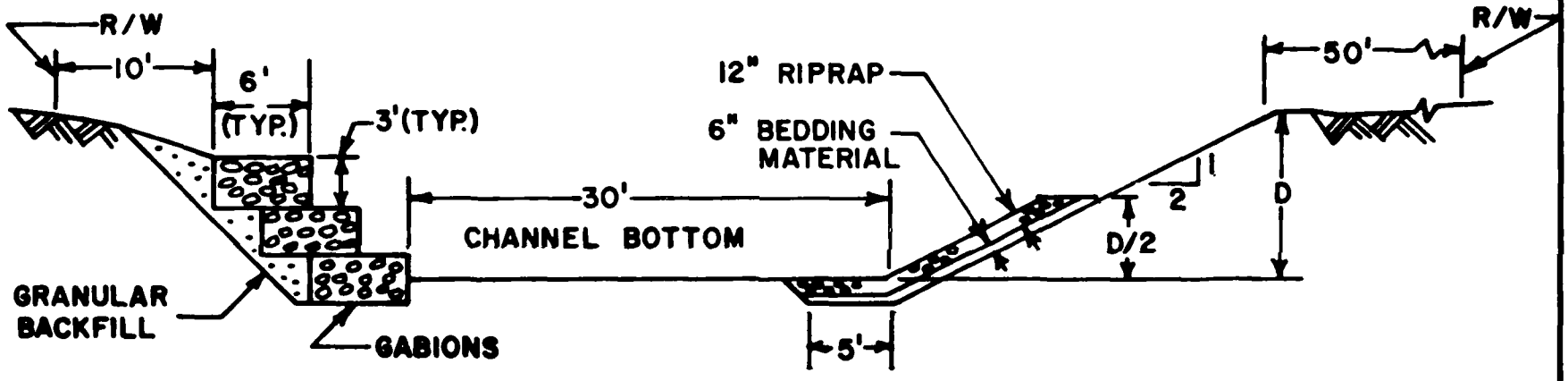
TYPICAL LEVEE SECTION

HORIZONTAL SCALE IN FEET

40 0 40 80 120

STE. GENEVIEVE, MISSOURI
TYPICAL CROSS SECTION
PLAN I
URBAN DESIGN LEVEE

PLATE 10



NO SCALE

STE. GENEVIEVE, MISSOURI
TYPICAL CROSS SECTION
TRIBUTARY
CHANNEL WIDENING

PLATE 11

FINAL
ENVIRONMENTAL IMPACT STATEMENT

STE. GENEVIEVE, MISSOURI
FEASIBILITY REPORT

The Responsible Lead Agency is the
US ARMY ENGINEER DISTRICT, ST. LOUIS

Abstract: Ste. Genevieve is located adjacent to the Mississippi River in Ste. Genevieve County, Missouri. Its French Colonial architecture is of national and international significance. The town is a Registered National Historic Landmark and is listed on the National Register of Historic Places. It experiences flooding from the Mississippi River and two tributary streams. An array of structural and non-structural flood damage reduction measures was developed. From these measures, four plans were developed that address the flooding problem while not damaging the town's historic resources. A decision of no action will probably result in the deterioration or destruction of the National Register Property, and is thus by definition a significant adverse effect.

Plan 1 best meets all the objectives set forth in this study and consists of an urban design levee that protects the town from Mississippi River flooding, widening of the two tributaries to protect from their flooding, and some recreational and environmental measures on lands needed for flood control. This plan is supported by the City of Ste. Genevieve and the Ste. Genevieve County Levee District #3.

Historic preservation in Ste. Genevieve is in the Federal interest, and substantial flood protection similar to Plan 1 has been found to be a necessary part of any general effort to protect and enhance the historic resource in the community. However, Plan 1 and other appropriate plans are not economically justified. This study is submitted with the finding that no Federal action by the Corps of Engineers is warranted when examined under our economic justification criteria.

Implementation responsibility for a plan to protect historic Ste. Genevieve from flooding remains an unresolved issue. Other Federal and non-Federal agencies are encouraged to preserve the historic resource in Ste. Genevieve, and to provide flood protection for the community so that the expected continued deterioration of the historic resource due to flooding can be prevented.

If You Would Like Further Information Please Contact:

Mr. David Gates (PD-A)
US Army Engineer District, St. Louis
210 Tucker Blvd., North
St. Louis, Missouri 63101
Comm. Telephone: 314-263-5711
FTS: 273-5711

NOTE: Additional information contained in appendices, plates and the main report are incorporated by reference in the EIS.

STE. GENEVIEVE, MISSOURI
FEASIBILITY REPORT
FINAL ENVIRONMENTAL IMPACT STATEMENT

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STE. GENEVIEVE, MISSOURI
FEASIBILITY REPORT
FINAL ENVIRONMENTAL IMPACT STATEMENT

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STE. GENEVIEVE, MISSOURI
FEASIBILITY REPORT
FINAL ENVIRONMENTAL IMPACT STATEMENT

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SECTION 1 - SUMMARY

1.1 MAJOR CONCLUSIONS AND FINDINGS

The town of Ste. Genevieve is a Nationally and internationally significant historic resource. A major part of the community is a Registered National Historic Landmark and is listed on the National Register of Historic Places. The community experiences severe flooding that threatens both historic and non-historic structures. A decision of no action will probably result in the deterioration or destruction of the National Register property, and is thus by definition a significant adverse effect. The selected plan (Plan 1) would alleviate the flooding problem while not adversely impacting the historic resource. The ecological and archaeological impacts of Plan 1 are minor.

Historic preservation in Ste. Genevieve is in the Federal interest, and substantial flood protection similar to Plan 1 has been found to be a necessary part of any general effort to protect and enhance the historic resource in the community. However, Plan 1 and other appropriate plans are not economically justified. This study is submitted with the finding that no Federal action by the Corps of Engineers is warranted when examined under our economic justification criteria.

1.2 AREAS OF CONTROVERSY

Plan 1 meets the planning objectives and is supported by local interests. However, the project benefits are primarily intangible (cultural-historical) and the project is not economically justified. Due to current policy these factors have resulted in the finding that no Federal action by the Corps of Engineers is warranted when examined under our economic justification criteria.

1.3 UNRESOLVED ISSUES

Implementation responsibility for a plan to protect historic Ste. Genevieve from flooding remains an unresolved issue. Other Federal and non-Federal agencies are encouraged to preserve the historic resource in Ste. Genevieve, and to provide flood protection for the community so that the expected continued deterioration of the historic resource due to flooding can be prevented.

1.4 RELATIONSHIP TO ENVIRONMENTAL REQUIREMENTS

The detailed plans developed in the final iteration were subjected to a review of their compliance with the appropriate environmental regulations and directives. Their degree of compliance is shown in TABLE EIS-1.

TABLE EIS-1
RELATIONSHIP OF PLANS FOR STE. GENEVIEVE, MISSOURI
TO ENVIRONMENTAL REQUIREMENTS

Regulation	Plans 1	2	3	4
Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. Council on Environmental Quality, 29 November 1978.	FC	FC	FC	FC
Clean Water Act of 1977 [1] (Public Law 92-500, as amended, Section 401 and Section 404)	PC	PC	PC	PC
Executive Order 11988, Flood Plain Management, 24 May 1977	FC	FC	FC	FC
Executive Order 11990, Protection of Wetlands, 24 May 1977	FC	FC	FC	FC
Analysis of Impacts on Prime and Unique Farmlands in EIS Council on Environmental Quality Memorandum, 30 August 1976.	FC	FC	FC	FC
Endangered Species Act of 1973 as amended	FC	FC	FC	FC
Principles and Guidelines for [2] Planning Water and Related Land Resources. Water Resources Council, 10 March 1983	FC	FC	FC	PC
National Historic Preservation Act [3] of 1966, as amended	PC	PC	PC	PC

TABLE EIS-1
(Continued)

Regulation	Plans 1	2	3	4
River and Harbor and Flood Control Act of 1970. Public Law 91-611, Section 122	FC	FC	FC	FC
Fish and Wildlife Coordination Act of 1958	FC	FC	FC	FC

FC - Full Compliance
PC - Partial Compliance

1/ Full compliance will be achieved after completion of requirements to obtain Clean Water Certification under Section 401 procedures.

2/ Plan 4 only partially meets the planning objectives, e.g., it does not provide substantial protection from Mississippi River flooding.

3/ Full compliance will be achieved after completion of an archeological survey prior to any construction.

SECTION 2 - NEED FOR AND OBJECTIVES OF THE ACTION

2.1 STUDY AUTHORITY

The Ste. Genevieve, Missouri study is authorized by a resolution introduced by Congressman Parke M. Banta of Missouri and adopted on 17 June 1948 by the Committee on Public Works of the United States House of Representatives.

2.2 PUBLIC CONCERNS

Based on coordination with Federal, state, and public agencies and individuals, the greatest concerns are flooding and historic preservation.

2.3 PLANNING OBJECTIVES

The planning objectives for the Ste. Genevieve study are listed below. Management measures examined in the study address one or more of these objectives.

a. Reduce the loss of life, the damages to historic structures, the disturbance to the historic setting, the economic losses, and the social disruption caused by flooding of the Mississippi River.

b. Reduce the damages to historic structures, the economic losses, and the social disruption caused by flooding of North Gabouri Creek and South Gabouri Creek.

c. Preserve and enhance the historic character of Ste. Genevieve.

d. Increase the quantity and quality of outdoor recreation opportunities in the study area.

e. Safeguard and improve the quality of the environment in the study area, including ecological and archaeological resources.

SECTION 3 - ALTERNATIVES

3.1 PLANS ELIMINATED FROM FURTHER STUDY

Detention dams/reservoirs and major diversions of tributary streams were determined to be infeasible because of high costs, karst topography, and the Mississippi Lime Company mine which underlies much of the area. Additionally, the impoundment locations in the South Gabouri Creek watershed were a long distance from the damage area and would produce little economic and historic benefits.

Further screening of other alternatives was accomplished in two planning iterations.

First Iteration - The first iteration measures developed by the District included reanalyses of plans developed by the Corps in the 1970's. Eight levee/floodwall measures were developed; each designed at three levels of protection. Nonstructural measures included (1) the relocations of 10 and demolition of 23 structures impacted by 10-year flood events, and (2) relocation of 16 historic structures to flood free sites. A maximized recreation measure was also developed.

The first iteration measures were evaluated on the basis of cultural resource effects, level of protection, costs, economic and recreation benefits, and ecological effects. The findings of the

evaluation were that two levee measures (Measures 6 and 8) had overall beneficial effects on cultural resources. These measures would protect the historic buildings from Mississippi River flooding and not have an adverse effect on the historic setting. Some flood damage reduction measures had severe adverse effects on the historic setting. The appropriate level of protection for the levee alternatives was determined to be the Urban Design Flood with 3 feet of freeboard. Costs and benefits were developed for all measures and only the recreation measure was found to have a positive benefit/cost ratio. The ecological effects of the first iteration measures were found to be minor and did not significantly influence the decision process. The conclusion of the first planning iteration was to carry forward Measures 6 and 8 and the recreation measure.

Second Iteration - In the second iteration, local interests requested that Measure 6 be modified to reduce agricultural impacts. Three modifications of Measure 6 were developed, i.e., Measures 9, 10 and 11. Five additional structural and nonstructural measures addressing headwater flooding on North and South Gabouri Creeks were also developed. These measures included such features as channel widening, bridge modifications, small levees, clearing and snagging, relocation of structures, elevating structures, and floodproofing. A modified recreation measure was also developed. It consisted of facilities placed on flood control lands and associated with channel widening and with Mississippi River levee measures.

The second iteration measures were evaluated on the basis of level of protection; costs; economic, recreation and ecological benefits; cultural resources effects; and ecological effects. A summary of the evaluation is given in TABLE EIS-2.

The public involvement program and the Corps of Engineer study through the second iteration showed that all the second iteration measures had some prospect of being included in the selected plan. Conversely, all the first iteration measures had been refined or eliminated from consideration.

The analysis involved with each of the above alternatives is explained in greater detail in APPENDIX A - Plan Formulation, as well as the "Flood Damage Reduction and Related Measures" section of the Main Report.

3.2 WITHOUT CONDITION (NO ACTION)

Land use changes are not expected to be significant. The economy will continue to rely on manufacturing, professional services, retail trade, agriculture, construction and tourism.

Flooding will continue to adversely impact the historic structures as well as other residential and commercial structures and agricultural lands. Of over 400 historically significant buildings in Ste. Genevieve

TABLE EIS-2
SUMMARY OF EVALUATION
OF SECOND ITERATION MEASURES

	Total First Cost[1/] ($1000)	Total Annual Benefits ($1000)	Total Annual Costs ($1000)	Benefit/ Cost Ratio	Level of Protection Relative to Ag. Levee	Effect on Ecology (+-scale) 3/	Effect on Cultural Resources (Type) 4/
Measure 9 Levee Mississippi	26,800	353.4	2,513	0.14	+ [2/]	0	Type 1
Measure 10 Levee Mississippi	28,300	367.7	2,659	0.14	+	+1	Type 1
Measure 11 Levee Mississippi	27,000	368.6	2,540	0.15	+	+1	Type 1
Measure 12 Chan/Levee S. Gabouri	3,000	53	238	0.22	N.A.	0	Type 1
Measure 13 Chan/Levee N. Gabouri	1,550	25.3	124	0.20	N.A.	0	Type 1
Measure 16 Recreation On Tribs. & Levee	150	45	19	2.4	N.A.	0	N.A.
Measure 18 Clear & Snag S. Gabouri	14	3.8	2	1.9	N.A.	0	Type 3
Measure 19 Clear & Snag N. Gabouri	8	10	1.6	6.3	N.A.	0	Type 3
Measure 22 Nonstructural N. & S. Gabouri	1,100	97	88	1.10	N.A	0	Type 1

1/ October 1982 price level.
2/ (+) indicates levee is higher than Federal agricultural levees.
3/ (+- scale) is explained in APPENDIX F - ECOLOGICAL RESOURCES
4/ Type 1=overall beneficial effect, where measure accomplishes significant flood protection in a manner compatible with cultural resources; Type 2=overall adverse effect, where measures accomplish flood protection but directly cause adverse effect to cultural resource; Type 3=measures which directly cause adverse effect to cultural resource and/or leave numerous historic buildings susceptible to frequent floods.

(according to an ongoing inventory compiled by the University of Missouri), there are 230 within the Urban Design or Standard Project flood zone. (As stated in the Main Report, there were 154 buildings, of which 87 are subject to flooding, in the inventory at the time the draft was prepared. These figures are used in the remainder of this statement.) Attrition of historic buildings has been occurring throughout Ste. Genevieve's history. In 1803, there were about 150 French Colonial buildings in Ste. Genevieve; of these, only 35 now remain. Attrition of historic buildings can result from a single disastrous flood or from moderate inundations repeated over time. Attrition will continue as long as flood protection is not in place; therefore, to take no action will indirectly cause deterioration or destruction of historic properties, by definition an adverse effect.

3.3 PLANS CONSIDERED IN DETAIL

The final set of plans for Ste. Genevieve were formulated by combining second iteration measures or parts of these measures.

In terms of basic components, Plans 1, 2 and 3 (Main Report PLATES 6, 7 and 8) achieve flood control through urban design levees, pump stations, gravity drains, ditches, new creek channels (except in Plan 3), stream widening with small levees, bridge replacements/removals, a variety of recreational facilities, and borrow pits converted to marsh habitat. Plan 4 (Main Report PLATE 9) consists of clearing and snagging, minor levee development and floodproofing. A more detailed description of the component features of each of these final plans is provided in

AD-A161 291 STE GENEVIEVE MISSOURI FEASIBILITY REPORT (FLOOD CONTROL STUDY FOR HISTOR..(U) ARMY ENGINEER DISTRICT ST LOUIS MO J ZEREGA ET AL. MAR 85 3/4

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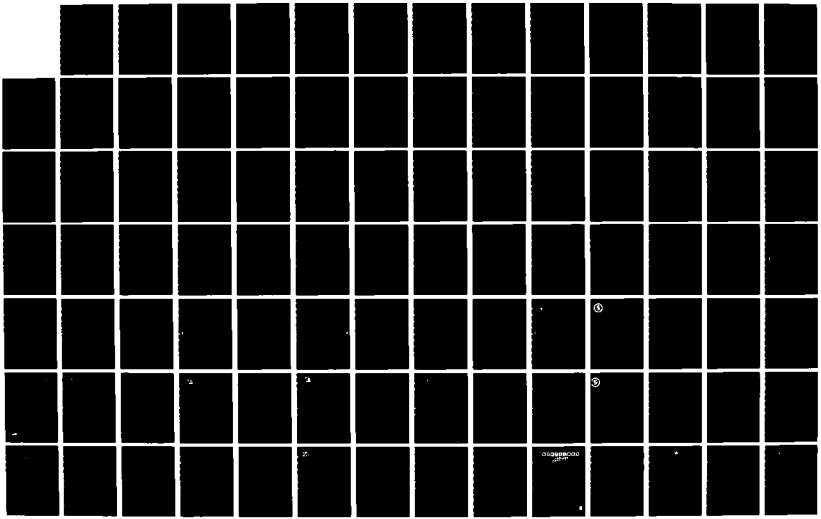

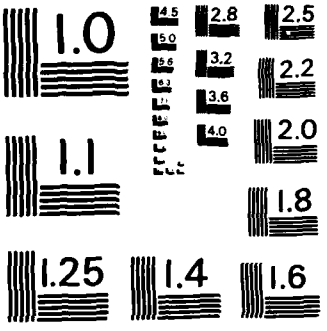

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963 - A

comparative form in TABLE EIS-3. Additional information can be found in APPENDIX A - Plan Formulation, as well as the Main Report.

Plan 4 has been designated the National Economic Development (NED) plan. The NED plan is the plan that reasonably maximizes net national economic development benefits, consistent with protecting the Nation's environment. Of all the flood damage reduction measures examined, the only measures that had net NED benefits were clearing and snagging on South and North Gabouri Creeks (Measures 18 and 19), the small levee along North Gabouri Creek (part of Measure 22), and the floodproofing of the Bilt Best Window Company Warehouse (part of Measure 22). Plan 4 is a combination of these measures and features.

Plan 3 has been designated the Environmental Quality (EQ) Plan. The Plan 3 levee is less visible from the south part of Ste. Genevieve than the Plan 1 and Plan 2 levees. Plan 3 protects one more historic structure than Plan 1 does. It provides protection from Mississippi River floods for the maximum number of unique historical properties and provides the greatest net benefits to other environmental resources.

Plan 1 was selected as the best plan to reduce flood damages and provide related benefits in Ste. Genevieve, Missouri. Under Principles and Guidelines the NED plan is to be selected unless there is an overriding reason for selecting another plan based on other Federal, state, local, and international concerns. The NED plan was not selected

TABLE EIS-3
STE. GENEVIEVE
COMPONENT FEATURES OF DETAILED PLANS

Feature	Plan	1	2	3	4
Flood Control Improvements	Measures Combined	9, 12, 13 & 16	10, 12, 13 & 16	11, 12, 13 & 16	18, 19, 22 (Partial)
Urban Design Levee Protecting Ste. Genevieve from Mississippi River Flooding		3.2 miles	3.3 miles	3.3 miles	-
Pump Station		1-650 cfs pump	1-800 cfs pump	1-650 cfs pump	-
Gravity Drains		3	2	2	-
New Ditches for Interior Drainage		4,000 linear feet	4,000 linear feet	4,000 linear feet	-
New Creek Channel		1,200 linear feet	2,660 linear feet	-	-
Stream Widening on North and South Gabouri Creeks with Small Levees		1.83 miles 2,200 linear feet levee	1.83 miles 2,200 linear feet levee	1.83 miles 2,200 linear feet feet levee	- -
Bridge Replacements		6	6	6	-
Bridge Removals		1	1	1	-
Clearing and Snagging on North and South Gabouri Creeks		-	-	-	0.83 miles
Low (5 foot high) Levee Along North Gabouri Creek		-	-	-	1,000 linear feet
Floodproofing		-	-	-	One Structure

TABLE EIS-3 (CONTINUED)
STE. GENEVIEVE
COMPONENT FEATURES OF DETAILED PLANS

FEATURE / PLAN	1	2	3	4
Recreation/Improvements				
Hiking/Biking Trails	X	X	X	-
Picnic Tables	X	X	X	-
Small Parking Lots	X	X	X	-
Bike Parking Racks	X	X	X	-
Exercise Trail Parcours	X	X	X	-
Softball Diamond	X	X	X	-
Selected Plantings	X	X	X	-
Environmental Improvements				
Borrow Areas Turned into Marsh	79 acres	93 acres	108 acres	-
Protection of Historical Structures	85 structures	86 structures	86 structures	none
Protection of Sewage Lagoon	-	-	X	-
Modified Mowing Program on Levees	X	X	X	-
One-Bank Channel Widening	X	X	X	-
Season Regulated Forest Clearing	X	X	X	-

because the economic and environmental benefits provided by the plan are insignificant when compared to the flooding problems (particularly from the Mississippi River) in Ste. Genevieve and the debilitating effects of continued flooding on the unique historical resources in the community. The flooding of historical buildings in Ste. Genevieve is a matter of local, state, National, and international concern.

Plan 1 was selected rather than Plan 2 because Plan 2 is more costly and was unacceptable to the local sponsors because of its higher costs.

Although Plan 3 is an attractive plan from the environmental quality standpoint, Plan 1 was selected because Plan 3 has higher operation and maintenance costs and was not acceptable to the local sponsor.

3.4 COMPARATIVE IMPACTS OF ALTERNATIVES

The environmental effects of the plans are discussed in detail in Appendices A, E and F. A brief review of the net environmental effects on significant resources and the economics of all plans is presented in TABLE EIS-4.

TABLE EIS-4
STE. GENEVIEVE NET ENVIRONMENTAL EFFECTS OF ALTERNATIVE PLANS

Environmental Resources	Alternatives				
Cultural Elements	Plan 1	Plan 2	Plan 3	Plan 4	No Action
Historic Sites	Benefit effect accures from flood protection.	Benefit effect accures from flood protection.	Benefit effect accures from flood protection.	Indirect adverse effect due to neglect resulting in continued flood damage.	Indirect adverse effect due to neglect resulting in continued flood damage.
Archeological Sites	Benefit effect accures from flood protection.	Benefit effect accures from flood protection.	Benefit effect accures from flood protection.	Indirect adverse effect due to neglect resulting in continued flood damage.	Indirect adverse effect due to neglect resulting in continued flood damage.
Ecological Elements					
Prime Farmland	Loss of 76.0 ac. Protection of 385 ac.	Loss of 89.3 ac. 421 acres protected.	Loss of 89.7 ac. 575 ac. protected.	NSI	Continued periodic flooding 595 acres.
Wetlands	Increase of 79 acres.	Increase of 93 acres.	Increase of 108 acres.	NSI	NSI
Water Quality	Minor, temporary decrease.	Minor, temporary decrease.	Minor, temporary decrease	Minor, temporary decrease.	Continued degradation of South Gabouri Creek from lime mine discharges.
Sewage Lagoons	NSI	NSI	Flood protection provided	NSI	NSI
Water Supply (Ground Water)	NSI	NSI	NSI	NSI	NSI
Endangered Species	Net loss of 6255 feet of low quality potential Indiana bat summer habitat. Minor increase for 2 state listed plants. (No effect.)	Net loss of 3736 feet of low quality potential Indiana bat summer habitat. Minor increase for 2 state listed plants. (No effect.)	Net loss of 3346 feet of low quality potential Indiana bat summer habitat. Minor increase for 2 state-listed plants. (No effect.)	Net degradation of 4382 feet of low quality potential Indiana bat summer habitat. (No effect.)	No effect.
Floodplain Forest	Minor decrease	NSI	Minor decrease	NSI	NSI

TABLE EIS-4 (Cont'd)
STE. GENEVIEVE NET ENVIRONMENTAL EFFECTS OF ALTERNATIVE PLANS

Environmental Resources	Alternatives				
Ecological Elements	Plan 1	Plan 2	Plan 3	Plan 4	No Action
Aquatic Resources	1.83 miles of tributary streams degraded.	1.83 miles of tributary streams degraded.	1.83 miles of tributary stream degraded.	0.83 miles of tributary streams degraded.	NSI
Terrestrial Resources	Moderate beneficial impact for wetland species; minor loss of riparian habitat (6255 feet).	Moderate beneficial impact for wetland species; minor loss of riparian habitat (3736 feet).	Moderate beneficial impact for wetland species; minor loss of riparian habitat (3736 feet)	NSI	NSI
Aesthetics	Improvement because flood fight no longer necessary, buildings not damaged, neighborhood renewal.	Improvement because flood fight no longer necessary, buildings not damaged, neighborhood renewal.	Improvement because flood fight no longer necessary, buildings not damaged, neighborhood renewal.	NSI	NSI

TABLE EIS-4 (Cont'd)
STE. GENEVIEVE NET ENVIRONMENTAL EFFECTS OF ALTERNATIVE PLANS

Economic Elements	Plan 1	Plan 2	Plan 3	Plan 4	No Action
Community Cohesion	Positive impact due to reduction of frequency & severity of flooding related damages & interruptions of community activities.	Positive impact due to reduction of frequency & severity of flooding related damages & interruptions of community activities.	Positive impact due to reduction of frequency & severity of flooding related damages & interruptions of community activities.	NSI	Negative impact due to continued interruptions of community activities.
Displacement	None	None	None	None	Negative impact due to destruction of structures and subsequent abandonment caused by continued flooding.
Property Value	Positive impact due to reduction of frequency & severity of flooding & related damages.	Positive impact due to reduction of frequency & severity of flooding & related damages.	Positive impact due to reduction of frequency & severity of flooding & related damages.	NSI	Negative impact due to continued flooding & related damages.
Population	NSI	NSI	NSI	NSI	NSI
Land Use	NSI	NSI	NSI	NSI	NSI
Health, Safety and Welfare	Positive impact due to decrease in frequency & severity of flooding.	Positive impact due to decrease in frequency & severity of flooding.	Positive impact due to decrease in frequency & severity of flooding.	NSI	Negative impact due to continued flooding.
Housing	NSI	NSI	NSI	NSI	NSI
Growth	Improves opportunities for individuals to remain in or migrate to area.	Improves opportunities for individuals to remain in or migrate to area.	Improves opportunities for individuals to remain in or migrate to area.	NSI	Negative impact due to continued frequent & sever flooding could retard or possibly prevent projected growth.

TABLE EIS-4 (Cont'd)
STE. GENEVIEVE NET ENVIRONMENTAL EFFECTS OF ALTERNATIVE PLANS

Economic Elements	Plan 1	Plan 2	Plan 3	Plan 4	No Action
Tax Revenue	Positive impact due to reduction in interruptions of economic activities & damages caused by flooding.	Positive impact due to reduction in interruptions of economic activities & damages caused by flooding.	Positive impact due to reduction in interruptions of economic activities and damages caused by flooding.	NSI	Negative impact due to continued interruptions of economic activites caused by flooding.
ECONOMICS					
Annual Damages	62,800	50,900	51,900	465,900	$515,100
Annual Flood Control Benefit	452,300	464,200	463,200	49,200	0
Annual Redevelopment Benefit	NA	NA	NA	NA	NA
Annual Recreation Benefit	45,200	45,200	45,200	0	0
Ecological Benefits	9,000	10,600	12,300	0	0
Total Annual Benefits	506,500	520,000	520,700	49,200	0
Total Annual Costs	3,034,000	3,187,000	3,066,000	35,000	0
Annual Net Benefits	-2,527,500	-2,667,000	-2,545,300	+14,200	0
BCR	0.17	0.16	0.17	1.40	0

SECTION 4 - AFFECTED ENVIRONMENT

4.1 ENVIRONMENTAL CONDITIONS

The study area includes of a portion of the Mississippi River floodplain which is primarily devoted to agricultural crop production. A few remnants of forest exist adjacent to the river bank, the North and South Gabouri Creeks, Valle Spring Branch, and the Mississippi Slough.

Adjacent to the Mississippi floodplain are the rolling Ozark hills drained by the three tributary creeks. Most of the uplands are a patchwork of forest and pasture with forest being more extensive in the headwaters. Crop production is limited to the narrow creek floodplains.

The town itself begins on the edge of the floodplain and extends into the uplands. North and South Gabouri Creeks flow through the town.

Wildlife habitat quality varies from good to excellent in the headwaters, and from fair to poor in the urban and intensively farmed areas.

The town of Ste. Genevieve is a unique historic town that was founded during the French Colonial period in the 1700's. It has more French Colonial residences than any other town in North America. Many are subject to flooding.

4.2 SIGNIFICANT RESOURCES

All resources described here are more fully described in the Main Report, the Cultural Resources Appendix (Appendix E) and the Ecological Resources Appendix (Appendix F). TABLE EIS-5 lists each significant resource, the basis for its significance, and its indicators.

Cultural Resources.

a. Historical.

Ste. Genevieve was founded by French colonists about 1750 and is the earliest permanent European settlement in Missouri. Surviving buildings which date from the 18th century and later, and which reflect all episodes of the city's history, lend national significance to Ste. Genevieve. As a result, the town is a National Historic Landmark and is listed on the National Register of Historic Places.

Of Ste. Genevieve's historically significant buildings, over one-third were in the 1973 flood zone (about a 30-year frequency); forty percent are within the 100-year flood zone; and over one-half are within the Urban Design flood zone for the Mississippi River. Tributary flooding affects fewer historic buildings; 14 percent for the 100-year flood (both creeks) and about one-third for the Standard Project Flood (both creeks).

TABLE EIS-5
Significant Environmental Resources
That May be Impacted by Water Resource Development

Resource	Basis of Signficance	Indicators
Historical Structures	Executive Order 11593, National Historic Preservation Act of 1966, as amended	Number of structures, flooding frequency
Archaeological Sites	Executive Order 11593, National Historic Preservation Act of 1966, as amended	Number of sites
Prime Farmland	Analysis of Impacts on Prime and Unique Farmlands in EIS. Council on Environmental Quality Memorandum, 30 Aug 76	Acres/flooding frequency
Wetlands	Clean Water Act of 1977 (Public Law 92-500, as Amended, Section 404) Executive Order 11990 Protection of Wetlands, 24 May 1977	Acres /flooding frequency
Water Quality	Clean Water Act of 1977	Physical, chemical, and biological properties
Sewage Lagoon	National Environmental Policy Act of 1969	Flooding frequency
Water Supply (Groundwater)	National Environmental Policy Act of 1969	Number of wells effected.
Endangered Species		
Federal	Endangered Species Act of 1973, as amended	Available habitat
State	Wildlife Code of Missouri	Available habitat
Floodplain Forest	Fish and Wildife Coordination Act of 1958	Acres
Aquatic Resources	Fish and Wildlife Coordination Act of 1958	Water Quality/Length of stream

TABLE EIS-5
(Continued)

Resource	Basis of Signficance	Indicators
Terrestrial Resources	Fish and Wildlife Coordination Act of 1958	Acres/flooding frequency
Aesthetics	River and Harbor and Flood Control Act of 1970, Public Law 91-611, Section 122	Visual effect
Community Cohesion	River and Harbor and Flood Control Act of 1970, Public Law 91-611, Section 122	Historical data and visual observations
Displacement	River and Harbor and Flood Control Act of 1970, Public Law 91-611, Section 122	Plan formulation and visual observ-ation
Property Values	River and Harbor and Flood Control Act of 1970, Public Law 91-611, Section 122	Assessed values, visual appraisals and forecasting

b. Archaeological.

Important archaeological sites which span the last 9,000 years of prehistory have been identified in the vicinity of Ste. Genevieve. One is listed on the National Register of Historic Places. Artifacts which date from the late prehistoric period and from the early historic period have been found within the Ste. Genevieve city limits.

c. Aesthetics.

The village of Ste. Genevieve has a pleasing visual appearance with its many well-kept historic homes, many with gardens, situated on the edge of the expansive Mississippi River floodplain.

Environmental Resources.

a. Prime Farmland. 595 acres in the Mississippi River floodplain is qualified as prime farmland. The rest would qualify as prime farmland except that it is flooded more frequently than every two years.

b. Wetlands. The only significant wetland in the study area is the Mississippi Slough, a tree-lined old river channel on the Mississippi River floodplain.

c. Water Quality. In December 1982 the Corps took water quality samples from North and South Gabouri Creeks and Valle Spring Branch. The water quality of these streams met all the general state criteria at the time sampled, except for the reach of South Gabouri Creek below the Mississippi Lime Company mining operation. This area experiences intermittent problems with storm runoff and mine waste discharges that can impact the ecosystem. Except for the above mentioned area, North and South Gabouri Creeks are fairly typical of small streams draining agricultural and urban watersheds.

d. Sewage Lagoon. The sewage lagoon is inundated by about an 8-year frequency Mississippi River flood. The city is planning to replace the lagoon with a sewage treatment plant that provides better treatment and would not be damaged by a 100-year flood.

e. Water Supply (Groundwater). The community's water supply wells are located on the Mississippi River floodplain and groundwater is pumped for use. The wells are not subject to flooding except by floods higher than the 100-year flood.

f. Endangered Species.

(1) Federal.

a. Bald Eagle. The Bald Eagle is a winter visitor to the Ste. Genevieve area, primarily along the Mississippi River.

b. Indiana Bat. Potential Indiana bat summer habitat exists along the tree-lined streams and Mississippi Slough.

(1) State. A number of state-listed plant and animals species may occur in study area. They are listed the Ecological Appendix (F).

g. Floodplain Forest. Most of the floodplain forest has been cleared for crops. The remaining floodplain forest is located adjacent to triburary streams, the Mississippi River and the Mississippi Slough.

h. Aquatic Habitat.

The study area has three tributary streams: North and South Gabouri Creeks and Valle Spring Branch. They start in the Ozark uplands, join in the floodplain and flow into the Mississippi River. The upper portions have a cobble and gravel substrate with little instream cover, while the lower portions have a mixture of bedrock, gravel, cobble, and muck for substrate, with instream cover consisting of a mixture of man-made and natural debris.

i. Terrestrial Habitat. Most of the floodplain is devoted to agriculture. The rest of the project area consists of the urban town of Ste. Genevieve. The most valuable wildlife habitat in the study area is the riparian forest corridors adjacent to portions of the tributary streams, Mississippi River and Mississippi Slough. The general quality of the wildlife habitat is fair to poor.

Socio-Economic Resources.

a. Population. Population statistics for Ste. Genevieve County indicate that the county's population has grown at an average rate of 5.1 percent per census period since 1900. The actual rate for each census period had not exceeded 8.0 percent until the most recent census period, 1970-1980, when a rate 18.0 percent was evidenced. Total population for Ste. Genevieve County in 1980 was 15,180.

The City of Ste. Genevieve, which is the largest in the county, had an average growth rate of 13.7 percent per census period since 1900. The actual rate for each census period had not been lower than 4.0 percent until the two most recent census periods, 1960-1970 and 1970-1980, when rates of 0.6 and 0.3 percent respectively were evidenced. Total population for the City of Ste. Genevieve in 1980 was 4,727.

The county's racial makeup is primarily white (99.4 percent), with the balance (0.6 percent) being composed of blacks, American Indians, Chinese, Phillipinos, Koreans, Asian Indians, and others. Family households are the primary living arrangements, with 91.9 percent of the county population.

b. Economy. The economy of Ste. Genevieve County is comprised of five primary areas of employment: manufacturing, professional services, retail trade, agriculture, and construction. These areas in 1980

employed 34.2, 16.0, 13.9, 11.4, and 8.0 percent of the county's employed person 16 years of age and over, respectively. The remaining 16.5 percent are employed in the areas of communications and public utilities, wholesale trade, finance/insurance and real estate, business and repair services, personal/entertainment and recreation services, and public administration. Tourism resulting from the historic nature of Ste. Genevieve is an important part of the economy of the community and influences several areas of employment. The unemployment rate for Ste. Genevieve County in February 1983 was approximately 12.7 percent.

The median family income in Ste. Genevieve County for 1979 was $18,693. Approximately 12.0 percent of the families had incomes of less than $7,500 while almost 5.4 percent had incomes of $40,000 or more. Families making less than the poverty level totalled 7.7 percent of all families.

SECTION 5 - ENVIRONMENTAL EFFECTS

The environmental effects of the final plans on each of the significant resources are discussed below. Further discussions are provided in Appendices A, E, F,and I. Separate discussions of endangered species is included in Appendix I. The net effects on significant resources are briefly tabulated in TABLE EIS-4.

5.1 HISTORICAL STRUCTURES

Plan 1. Plan 1 would provide 500-year protection from Mississippi River flooding to 85 of 86 historic buildings within that flood zone. The Plan would also provide 25-year flood protection from creek flooding. Plan 1 would enhance opportunities for restoration, rehabilitation, and in-place preservation of historic buildings.

Plan 2. Same as Plan 1, except that all 86 historic buildings subject to 500-year Mississippi River flooding would be protected.

Plan 3. Same as Plan 2.

Plan. 4. This plan would leave historic buildings subject to 5-year and higher Mississippi River floods, and to 2-year and higher creek floods.

5.2 ARCHAEOLOGICAL SITES

Plan 1. Plan 1 would protect floodplain areas now subject to flood-caused erosion. Adverse effects to archaeological sites would be avoided.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. Plan 4 would leave archaeological sites subject to erosional damage from flooding.

5.3 PRIME FARMLAND

Plan 1. Prime farmland (76.0 acres) will be removed from production by the building of levees and borrow areas for obtaining levee material. Flood protection provided for 385 acres.

Plan 2. Same as Plan 1 except that 89.3 acres will be removed from production. Flood protection provided for 421 acres.

Plan 3. Same as Plan 1 except that 89.7 acres will be removed from production. Flood protection provided for 575 acres.

Plan 4. No significant impact.

5.4 WETLANDS

Plan 1. The borrow areas will become semi-permanently flooded, fresh water, emergent wetlands. The net effect will be an increase of 79 acres.

Plan 2. Same as Plan 1 except that the net increase in wetland acres would be 93 acres.

Plan 3. Same as Plan 1 except that the net increase in wetland acres would be 108 acres.

Plan 4. No significant impact.

5.5 WATER QUALITY

Plan 1. A temporary increase in turbidity would occur during construction and until bank vegetation becomes reestablished which should take no more than 6 months. This plan would protect the water supply wells from flooding and would therefore protect the quality of the groundwater.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. A temporary increase in turbidity would occur during construction.

5.6 SEWAGE LAGOON

Plan 1. This plan would have no significant impact on the sewage lagoon.

Plan 2. Same as Plan 1.

Plan 3. This plan would provide flood protection to the sewage lagoon.

Plan 4. Same as Plan 1.

5.7 WATER SUPPLY (GROUNDWATER)

Plan 1. This plan would provide flood protection to the water wells, and would result in no significant effect to local groundwater.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. This plan would have no significant impact on either the water wells or the groundwater.

5.8 ENDANGERED SPECIES

Federal Species

Plan 1. No significant impact to the bald eagle is expected. Potential Indiana bat summer habitat would be lost by the removal of riparian vegetation. The Mississippi Levee would impact 1,670 feet of natural stream channel and 870 feet of wooded slough. However, a new 1200-foot channel would be established and its adjacent easement lands would be allowed to grow into riparian forest. The net effect would be a minor decrease in habitat (1,340 feet). Habitat would also be lost along South Gabouri Creek (2,857 feet) and North Gabouri Creek (2,059 feet). However, because of the degraded quality of the creek waters and the riparian forest and the urban setting of these areas it is not important summer habitat for Indiana bats.

Plan 2. Same effect as Plan 1 except that the Mississippi levee will impact 630 feet of Gabouri Creek and 850 feet of Slough. A new 2660 foot channel will be allowed to grow into riparian forest. The net effect will be a minor increase of 1,180 feet of potential Indiana bat summer habitat.

Plan 3. Same effect as Plan 1 except that the Mississippi levee will impact 700 feet of Gabouri Creek and 870 feet of Slough. No new channels will be established. The net loss in this area will be 1,570 feet of potential Indiana bat summer habitat.

Plan 4. No significant impacts to the bald eagle. 4,382 feet of stream channel would be reduced in value as potential Indiana bat summer habitat by removing trees that overhang the bank. The degraded quality of this stream as well as its urban nature, make it unlikely that it is important summer habitat.

State Species

Plan 1. It is unlikely that any state species listed in the disturbed urban area and intensively farmed land will be impacted by this plan. Two species of plants, Primrose Willow and Wild Sweet William, may occur in the Mississippi Slough which will be cut through by the levee; however, the creation of borrow pit wetlands should more than compensate for this small loss.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. It is unlikely that any of these sensitive species would occur in or adjacent to this disturbed urban stream.

5.9 FLOODPLAIN FOREST

Plan 1. The Mississippi River levee will result in the clearing of 8.8 acres. About 0.6 acres will become established adjacent to the new channel. The riparian forest along 1.83 miles of creek, on one side, will be replaced by mowed grass. Approximately 40 feet of a 50-foot right-of-way on the side the creek that is widened, will be left in a natural state or planted in wildlife-preferred vegetation.

Plan 2. Same as Plan 1 except that the Mississippi River levee will result in the clearing of 4.5 acres. About 1.2 acres of forest will become established adjacent to the new channel.

Plan 3. Same as Plan 2 except that no new channel would be included.

Plan 4. There will be very little clearing of trees since only trees growing within the stream bank will be removed.

5.10 *AQUATIC RESOURCES*

Plan 1. Small sections of South Gabouri Creek, Gabouri Creek and the Mississippi Slough will be filled during levee construction. All water-dependent species within the affected reach will be destroyed or displaced by levee construction. There will no longer be connections

between these water bodies and the Mississippi River during flood periods when water will be pumped. However, gravity drains will provide access to the Mississippi during low flow periods.

A portion of South Gabouri Creek (1.23 miles) and of North Gabouri Creek (0.60 miles) will be widened to 30 feet bottom width with 1 vertical on 2 horizontal side slopes. The widening will take place from one side. The aquatic habitat will be degraded by the removal of trees. An important direct effect of the removal of riparian vegetation is the disruption of aquatic food webs and the reduction in invertebrate and fish production as a result of the loss of terrestrial energy inputs. Areas lacking deciduous vegetation commonly have low diversity and numbers of aquatic intervebrates. The loss of riparian vegetation can also increase water temperatures due to the loss of shade. A shift in community structure can occur with resident species being replaced by species more tolerant of increased temperatures. The plan on the whole, is considered to have moderate adverse aquatic impacts.

Plan 2. Same as Plan 1 except that Valle Spring Branch will be rerouted into a new channel and sections of the stream will be filled for levee construction.

Plan 3. Same as Plan 1 except that approximately 700 feet of lower Gabouri Creek will be diverted into a new channel.

Plan 4. About 0.40 miles of North Gabouri Creek and 0.43 miles of South Gabouri Creek will be cleared and snagged which involves removing the man-made and natural debris in the stream channel as well as removing any trees growing within the stream banks. This will adversely impact the aquatic resources by removing the debris which is used by fish for cover and as substrate for aquatic invertebrates. The aquatic habitat will also be degraded by the effects of tree removal on aquatic food webs, invertebrate and fish production and a shift in community structure. The impacts, on a whole, are considered minimal due to the small length of creek affected. It is noted that South Gabouri Creek receives limestone mining wastes and the aquatic habitat is of lesser quality than North Gabouri Creek.

5.11 TERRESTRIAL RESOURCES

Plan 1. The Mississippi River levee construction will result in the following land use changes: -2.6 ac urban, -8.8 ac floodplain forest, -241.1 ac crop, -76.0 ac prime farmland, +167.0 levee, +79 ac potential wetlands and +6 ac new channel. The creation of wetlands will create good habitat for a variety of species such as the mallard, blue-winged teal, great blue heron, common egret, and muskrat, as well as a variety of aquatic reptiles and amphibians.

The remaining work would cause a decrease in vegetation diversity from riparian forest to mowed grass and will have an adverse impact. However, the impact will not be significant since the area impacted is relatively small and the existing habitat has been and is subject to disturbance from being in a urban setting. A 50 foot right-of-way on the side of the creek to be widened, of which approximately 40 feet will be left in a natural state or planted in wildlife preferred vegetation, will help offset the loss of the riparian forest.

Plan 2. Same as Plan 1 except that levee construction will result in the following land use changes: -0.5 ac urban, -4.5 ac floodplain forest, -257.8 ac crop, -89.3 ac prime farmland, -177.6 are levee, -93.6 ac potential wetlands, and +5.0 ac new channel.

Plan 3. Same as Plan 1 except that levee construction will result in the following land use changes: -0.5 ac urban, -4.5 ac floodplain forest, -292.6 ac crop, -89.7 prime farmland, +200.4 ac levee, +108 ac potential wetlands.

Plan 4. This plan will have minimum impact on terrestrial resources due to its limited size. Terrestrial species that would use the stream such as muskrats, green herons, aquatic reptiles and amphibians will be adversely impacted by the decrease in habitat diversity. Where structures are removed and natural vegetation is restored, there will be a minor beneficial impact.

5.12 AESTHETICS

Plan 1. The Mississippi River levee, because it would for the most part not be visible from historic areas in town, would not be a visual intrusion. Widening of tributary channels would also be unobtrusive, and in fact would restore them to widths more closely approximating those observed during Ste. Genevieve's early days. Most important is the fact that the plan would eliminate the aesthetic impact of flood fight activities as they are currently conducted, with temporary sandbag levees, other small levees, and associated pumps for seepage and basement flooding. The aesthetics of the more floodprone neighborhoods would be improved since buildings and property would no longer be threatened with the damages and cleanup that always accompany flooding.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. No significant impact.

5.13 COMMUNITY COHESION.

Plan 1. This plan will decrease the flood-caused interruptions in all forms of community activities, i.e., commercial, social, etc., while improving the possibility of individuals who would leave the area to

remain, thus stabilizing the family unit. The plan would encourage better upkeep of structures no longer subject to frequent flooding.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. No significant impact.

5.14 DISPLACEMENTS.

Plan 1. This plan results in no displacements.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. No significant impact.

5.15 PROPERTY VALUES

Plan 1. Property values will increase due to the decrease in frequency and extent of flooding and related damages.

Plan 2. Same as Plan 1.

Plan 3. Same as Plan 1.

Plan 4. No significant impact.

SECTION 6 - LIST OF PREPARERS

TABLE EIS-6 shows the people primarily responsible for the preparation of this study.

SECTION 7 - PUBLIC INVOLVEMENT

7.1 PUBLIC INVOLVEMENT PROGRAM

Since the Ste. Genevieve study was initiated in October 1973, many meetings have been held and a great deal of coordination has taken place with Federal, state and local interests. The initial Public Meeting was held in Ste. Genevieve on 7 June 1974. A public information meeting was held on 5 July 1979.

After the Board of Engineers for Rivers and Harbors review of the Ste. Genevieve Report in July 1980, many additional coordination meetings were held. The District briefed the Honorary French Consul in St. Louis on 19 November 1982. Meetings were held with elected City officials, Levee District #3 officials, Levee District #2 officials, and the

TABLE EIS-6
LIST OF PREPARERS

The following people were primarily responsible for preparing the Environmental Impact Statement:

Name	Expertise	Experience	Role
Brady, John	Terrestrial Ecosystems	11 years, Environmental Analysis St. Louis District (SLD)	Wildlife Biologist EIS Coordinator
Groh, Donald	Civil Engineering Management	2 years, Water Resource Planning SLD	Civil Engineer
Knight, George	Archaeology History	8 years of Cultural Resource Management and Historic Preservation	Cultural Resource Specialist
Marshall, Daniel	Civil Engineering Economics	4 years Soils; 12 years Structure and Design and 3 years Planning and Economics, SLD	Economist
Mathiesen, Roy M.	Recreation and Land Use	31 years of Landscape Architect; 15 years work with Park Departments and SLD	Landscape Architect
Morgan, Dennis	Civil Engineering (Geotechnical)	2 years, Civil Engineer in Foundations Branch SLD	Civil Engineer
Navin, Michael	Engineering Geologist	8 years in Geotechnical; 4 years Water Geology Section, SLD	Geologist
Niermann, Fredrick	Environmental Engineering (Water Quality)	8 years, Water Quality Section, SLD	Environmental Engineer
Norris, F. Terry	Archaeology	9 years, Contract Archaeology with various agencies; 5 years Environmental Analysis Branch, SLD	Archaeologist
Plambeck, Carol A.	Environmental Engineering	4 years, Environmental Architectural Section, Design Branch, SLD	Design Coordinator
Zerega, James	Civil Engineering	14 years, Water Resource Planning, St. Louis District, Nashville District	Study Manager

Foundation for the Restoration of Ste. Genevieve on 30 November 1982, 7 December 1982, 11 January 1983, and 31 May 1983. The Corps discussed plans for Ste. Genevieve with the Foundation for the Restoration of Ste. Genevieve, the University of Missouri historical research group, the Missouri Department of Natural Resources, the Missouri Heritage Trust, and Ste. Genevieve County elected officials on 16 March 1983. The District Engineer was the main speaker at the Ste. Genevieve Chamber of Commerce annual dinner on 7 April 1983, and he described the flooding problem and flood protection plans to more than 150 people.

The Draft St. Genevieve, Missouri Feasibility Report and Draft Environmental Impact Statement was coordinated with all interested Federal, state, and local agencies and organizations in March 1984. A final public meeting was held on 24 April 1984.

7.2 REQUIRED COORDINATION

Clean Water Act of 1977, 33 U.S.C. 1251 et seq. The Section 404b(1) evaluation will have to be coordinated and Clean Water Certification attained in accordance with Section 401 procedures prior to any construction.

Endangered Species Act of 1973, As Amended, 16 U.S.C. 1531, et seq. The results of coordination with the U.S. Fish and Wildlife Service as required by Section 7 of the act including the biological assessment and letter of biological opinion are presented in APPENDIX I.

Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq. The U.S. Fish and Wildlife Service and Missouri Department of Conservation have been involved during the plan formulation of this study. Planning aid letters, other correspondence with the service, and the Final Fish and Wildlife Coordination Act Report are attached as APPENDIX J.

National Historic Preservation Act of 1966, As Amended, 16 U.S.C. 470 et seq. Archaeological and Historic Preservation Act of 1974, As Amended, 16 U.S.C. 469 et seq. also referred to as the "Reservoir Salvage Act." If a flood control project were to be authorized, these acts would require the identification of direct project-related effects on cultural properties. If any affected property were to be listed on, or found eligible for listing on, the National Register of Historic Places, adequate mitigation measures (to offset any adverse project related effects) would have to be developed and implemented. Any necessary mitigation plans would have to be developed in consultation with the Missouri State Historic Preservation Officer and the Advisory Council on Historic Preservation.

Executive Order 11988, Flood Plain Management, 24 May 1977. This executive order was considered during the formulation of all alternatives. It is discussed in the "Plan Formulation" section of the main report.

Executive Order 11990, Protection of Wetlands, 24 May 1977. This executive order was considered during the formulation of all alternatives and all impacts are described in the main report. All alternative plans have features which will create wetlands.

Analysis of Impacts on Prime and Unique Farmlands in EIS, CEQ Memorandum, 30 August 1976. The effects of each alternative on prime and unique farmland was considered in the development of all alternatives. The impacts of each alternative on this resource are described in the "Impact Assessment" section and in APPENDIX F.

7.3 STATEMENT RECIPENTS

The draft Feasibility Report and Environmental Impact Statement was furnished to many agencies, organizations, and individuals for review and comment; including but not limited to the following:

Consul General de France
Canadian Consul General
U.S. House of Representatives
U.S. Senate
Advisory Council on Historic Preservation
Keeper of the National Register of Historic Places
U.S. Department of Agriculture
    Forest Service
    Soil Conservation Service
U.S. Department of Commerce
U.S. Department of Health, Education, and Welfare
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
    National Park Service
    Fish and Wildlife Service
U.S. Department of Transportation
    Coast Guard
U.S. Environmental Protection Agency
U.S. Department of Energy
Federal Emergency Management Agency
Governor of Missouri
Missouri Department of Conservation
Missouri Department of Natural Resources
    Missouri State Historic Preservation Office
Missouri State Legislators
Ste. Genevieve County
Mayor of Ste. Genevieve
Foundation for the Restoration of Ste. Genevieve
National Trust for Historic Preservation
National Society of Colonial Dames, Missouri Society
American Institute of Architects
Missouri Heritage Trust
University of Missouri - Columbia (Research Team)

The final Feasibility Report and Environmental Impact Statement is being furnished for review to the following agencies, organizations, and individuals known to have an interest in the project:

Consul General de France
U.S. House of Representatives
U.S. Senate
Advisory Council on Historic Preservation
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
U.S. Environmental Protection Agency
Federal Emergency Management Agency
Missouri Department of Natural Resources
Missouri State Clearinghouse, Office of Administration
Missouri State Legislators
Ste. Genevieve County
Mayor of Ste. Genevieve
Levee District Number 3 of Ste. Genevieve County
Foundation for the Restoration of Ste. Genevieve
National Trust for Historic Preservation
National Society of Colonial Dames, Missouri Society
American Institute of Architects
Missouri Heritage Trust
University of Missouri-Columbia (Research Team)

7.4 PUBLIC VIEWS AND RESPONSES

Letters from the United States Department of the Interior dated 18 May 1984, 13 March 1979, and 17 July 1978 support Corps of Engineers construction of flood protection for Ste. Genevieve. A letter from the City of Ste. Genevieve and Ste. Genevieve County Levee District #3 dated 6 June 1983 states their intent to act as the non-Federal co-sponsor for Plan 1 as presented in this report. A draft Feasibility Report dated March 1984 was disseminated to the public, and a final public meeting was held in Ste. Genevieve on 24 April 1984. A summary of the public meeting and copies of the above letters as well as letters commenting on the draft report are reproduced in the PUBLIC VIEWS AND RESPONSES section in this volumne of the report.

SECTION 8 - INDEX, REFERENCES AND APPENDICES

An index of the subjects discussed in the EIS and the remainder of the Main Report and Appendices is given in TABLE EIS-7.

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STE. GENEVIEVE, MISSOURI

FEASIBILITY REPORT

FLOOD CONTROL STUDY

FOR HISTORIC STE. GENEVIEVE - 80061

PUBLIC VIEWS AND RESPONSES

STE. GENEVIEVE, MISSOURI

FEASIBILITY REPORT

PUBLIC VIEWS AND RESPONSES

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SUMMARY OF THE 24 APRIL 1984 PUBLIC MEETING
ON THE CORPS OF ENGINEERS' FLOOD CONTROL FEASIBILITY STUDY
FOR STE. GENEVIEVE, MISSOURI

The meeting was held at the Ste. Genevieve Junior High School in Ste. Genevieve, Missouri. Fifty-five people attended the meeting and registered. In addition, fourteen employees of the St. Louis District, Corps of Engineers were in attendance.

CORPS OF ENGINEERS PRESENTATION

OPENING REMARKS - COLONEL GARY BEECH

The purpose of the meeting is to discuss our study of flood control alternatives for the community of Ste. Genevieve. Our recommendation, based on our economic analysis, is a negative report regarding the Corps of Engineers construction of a flood control project. Unfortunately, we have no method to quantify in a dollar amount the historic value of the community.

The closing date for comments on this study will be the 14th of May. Following the 14th of May we will be putting together our final report and in June we will send the report to the Lower Mississippi Valley Division in Vicksburg, Mississippi. The Division reviews the report and then transmits it to the Board of Engineers for Rivers and Harbors, who will then review it and send it to the Office of Chief of Engineers in Washington. They review it and forward it to the Assistant Secretary of the Army for Civil Works, who will then transmit it to Congress to fulfill the requirements of our study authorization provided by Congress.

In order to make a positive recommendation in a study report we have to show that there are more benefits that accrue from a project than there are costs. We relate these to a benefit/cost ratio. The benefits normally accrue from flood damages that are prevented, and the costs are normally the cost of construction and acquiring the necessary right-of-way. The costs are annualized by determining the annual principal and interest payments necessary to pay off the project. Annual operation and maintenance costs are also included in the computation of total annual costs.

We examined a number of different flood protection systems, at varying degrees of protection. We looked at different sized levees, different levee alignments and non-structural measures, and no plan that provided substantial protection provided anything close to a one-to-one benefit/cost ratio.

In the late 1970's the District came to the same conclusion, that there was not going to be a positive benefit/cost ratio. The Board of

Engineers for Rivers and Harbors reviewed a preliminary report and directed us to complete the study and try to show if Ste. Genevieve is unique enough to establish a federal interest in flood protection. In the meantime, the country has gone through a period of time where budget deficits are large and the benefit/cost ratio has taken on even greater meaning. At the present time it is almost the only determinant as to whether a project can receive a recommendation through our organization for construction by the Corps.

In our report we recognized the unique characteristics of the community. We believe we've documented it in a good fashion. Our recommendation says that, although we believe it to be in the federal interest for this area to be protected, it is not within our authorities to recommend that the Corps provide that protection. We will work with you as closely as we can and with other federal or state agencies to attempt to support any efforts to provide flood protection here.

GENERAL DISCUSSION - JIM ZEREGA

Mr. Zerega reiterated that the purpose of the recent part of the study was to develop a report that complies with comments received from the Board of Engineers in 1980. He described the interdisciplinary team that made the study and the Corps coordination with the public. He also described the organization of the report and the three-step planning process, i.e., (1) define the flooding problems, (2) develop a range of plans that address the problem, and (3) evaluate the plans.

Mr. Zerega also showed some introductory slides of the location of Ste. Genevieve and the areas subject to flooding.

DESCRIPTION OF CULTURAL RESOURCES - GEORGE KNIGHT

Mr. Knight gave a slide presentation on the Registered National Historic Landmark district and the historic buildings subject to flooding. He also briefly described the archeological resources in the study area.

DESCRIPTION OF FLOODS AND PLANS - JIM ZEREGA

Mr. Zerega showed slides of four recent major floods and discussed potential floods such as the 100-year and urban design floods. He presented slides showing several of the flood control plans developed for Ste. Genevieve, including Plan 1, the plan considered best for the community from the historic preservation and level of protection standpoints.

QUESTION AND COMMENT PERIOD

MRS. J. R. BODINE, COLONIAL DAMES OF AMERICA: A levee would be of extreme value for preserving historical buildings, which are absolutely irreplaceable, and it would encourage investment and industrial development.

COLONEL BEECH: What you say is accurate. However, we are prohibited from accumulating benefits based on development that would occur behind the levee, the rationale being that there are other areas available for development that would not require a levee.

MRS. VERGIE STANGE, COLONIAL DAMES OF AMERICA: The Colonial Dames owns and maintains three historic homes in Ste. Genevieve, and attract between twenty and twenty-five thousand visitors a year. We support some type of flood protection for Ste. Genevieve and for these buildings. Is there hope for Ste. Genevieve for flood protection when the benefits do not match the costs?

COLONEL BEECH: On any project we respond to the wishes and desires and directions of the Congress.

EMILY LYONS, KASKASKIA ISLAND CITIZEN'S COMMITTEE: I want to stress the importance of Ste. Genevieve in this French Colonial area.

Is the Corps taking into consideration money being spent by the Federal Flood Insurance program, and who could set a value on these historic homes if they come to a buy-out?

COLONEL BEECH: Damages that are covered by Flood Insurance are reflected in our accumulation of damages on an annual basis. The Federal Emergency Management Agency has a different charter than the Corps and they have certain rules for their buy-out program. Certainly the historic areas would not be attractive for a buy-out, because you would lose what is unique and historic about the community.

RUTH E. GILSTER, CHESTER, IL FRENCH COLONIAL DISTRICT: This area, on both sides of the river, is the 14th Colony. If you lose Ste. Genevieve, you are going to lose a Colony of the United States.

I think the Corps has gone a little far in your projections of the height of the levee.

COLONEL BEECH: Certainly no one would like to project a 500-year flood; the height, plus three feet of freeboard, of the levee we proposed. Our only comment is that based on record data and National Weather Service input as to what precipitation could occur in this general area, that if all things happen bad at the same time, water levels could reach that high. The lowest level levee we looked at was the 1973 flood level. We believe that anything lower would not have been satisfactory to the community.

BARBARA BASLER: I would love to see the day that Ste. Genevieve gets on the news for something positive and not for being flooded. After looking at all your studies since 1973, I don't see what you've done for us. The United States government is spending millions of dollars on their tools of destruction, why can't the government spend millions on a little construction.

COLONEL BEECH: I would just say that we don't make our own rules, we work under guidelines established for us and we try to do it as openly and honestly as we can.

KITTY PALMER: I sandbagged personally all day today to save my house and my neighbors' houses around us. I had to move my family out of the area because my house had water in it in 1979 and 1973. My house is the Michael Placet house you showed in a slide.

Is the basic reason we are considered to be ineligible for the levee because we don't have enough industry in town? Is our town too full of middle and lower income working people to be worth a levee?

COLONEL BEECH: Your community is like a number of communities up and down the river which happen to be rather small and don't generate the kinds of damages that would cause a levee to be a cost effective project.

FRANKLIN MYERS: The report is an excellent technical report and it is a good basis for action, the action that should be take right now. But there are some aspects of the report that are disturbing. Most of them are political considerations. One thing that bothers me is the fact that you have a conclusion that the project is not cost effective. That was a known, a given. The community has been working under the assumption that the Corps, even though then knew it was not cost effective, was somehow going to take this project and try to run with it. I think we have lost a couple of years when we should have been lining up other support. Probably the Department of Interior is the logical sponsor of the project.

Another thing that disturbs me, and I realize you are working under Public Law, is economic criteria. It seems strange, when you look at this section of the river and at Plate 2 in your report, every agricultural field in the area is protected. Last year, when we were paying farmers not to grow crops with federal money, we approved agricultural levees on a cost/benefit basis. Yet this criteria cannot protect homes and businesses and the most important intact French Colonial village in the United States. Something needs to be done with the criteria, it needs to be responsive to more things.

Another thing that bothers me is that you can say, because of the benefit/cost ratio, that the Corps has no responsibility for the project. I feel the guidelines should be changed so you do have a responsibility. Again, look at Plate 2 in your report. The levees built in this stretch of the river are bound to affect us. The whole floodplain across the river is blocked. The whole area downstream from us is a dam. And here we are sitting, the principal town in the area, the most historic French Colonial city west of the Mississippi, and we are sitting here relegated to function as a ponding area. I think there must be a responsibility under Federal guidelines to look at the cumulative effect of what is happening when you protect every other area near here and do nothing in Ste. Genevieve.

I feel that this project is important enough that our political representatives should take it, introduce it, and force it down on the Corps, not wait for the thing to surface through the bureaucracy.

COLONEL BEECH: We certainly didn't mean to mislead you. A year ago when I was here, I indicated that it had become apparent at that time that there was little likelihood of a positive cost/benefit ratio. I suggested at that time that our report may be a vehicle, but is was going to take a lot of work locally in order to generate the kind of support that would permit that to happen.

GREG SCHWENT, LEVEE DISTRICT 3: We have had flooding on the river since 1844 and not until 1973 has the city of Ste. Genevieve had to go into such extensive sandbagging operations. Can you tell us where the water is coming from? Do we have a funnel effect here, caused by the agricultural levee? What is the reason for the problem?

COLONEL BEECH: Certainly, weather is cyclic. We are in the second wettest five year period for a generation. The earlier five year period was in the early to mid-forties. Our records indicate that flood stages then ran about a foot and a half lower than the average flood crests from 1979 to 1983. So there was significant flooding back then.

There are certain things that do cause waters to be higher here. Several of the levees in this area tend to pond the water somewhat upstream. The private levees that existed before the Corps did any work on them also tended to do that same thing. So the impact of our work is where those levees had been overtopped previously and are now not overtopped. At that stage it tends to pond extra water upstream.

Other things have happened that tend to relieve the situation. There have been a series of Corps reservoirs built upstream from here, that tend to lower flood heights by retaining water that would normally come down here. These are not quite effective enough to take off all the water that has been increased in this area, but they tend to offset. There have also been a lot of sociological changes that have increased flood heights. There is more paving, more roofs, farmers are plowing fields clear down to the banks.

Regarding flood heights though, there are also a lot of things that don't make the same flow of water run past the same place at the same elevation. The temperature of the water, the time of year, the amount of sediment that is being carried in the stream, the amount of vegetation that is growing along the bank, and so on. We can record in St. Louis that a constant flow will come through three feet higher one time than it will another time.

GREG SCHWENT: What percentage of involvement has the Corps of Engineers had in these levees that have been built?

COLONEL BEECH: In most cases there was a private levee there prior to any Corps of Engineers work being done, Prairie du Rocher being a notable exception. As I recall, our first work along the river was in the 1940's.

GREG SCHWENT: With the Corps' involvement in these levees, could not the Corps have seen these problems coming? Does the Corps possibly have some legal obligations to Ste. Genevieve to protect us?

COLONEL BEECH: By and large, each one of the studies that were done on those levees indicated that there would be increased heights upstream from there. The sophistication and precision of the documentation depends on what year the studies were done. These reports were done in response to specific Congressional directives. They identify both benefits and damages that occur from a project. The Congress either does or does not authorize the construction of the projects.

GREG SCHWENT: With the agricultural levees and everything else down the river and up the river impacting on Ste. Genevieve, possibly you may look into some legal implications of protecting Ste. Genevieve.

RALPH MORRIS, PRESIDENT OF STE. GENEVIEVE CHAMBER OF COMMERCE: I would like to direct my comments to the members of Congress, and provide the Corps with a statement and give copies to the representatives of the Congressmen who are here tonight.

Mr. Morris read a statement that is reproduced later in the PUBLIC VIEWS AND RESPONSES section of the report.

COLONEL BEECH: There are similar tragedies up and down many of the rivers of our country. One of the ways the Congress has asked us to measure things is through the benefit/cost ratio. It's not something that was dreamed up by someone on Halloween night or who had evil in their heart. What they are trying to do is to sort out across the country who gets protection.

We certainly concur, and our report does, in your analysis of the historic portions of the community, but by the same token we appreciate the problem that there is in Washington and would like to draw your attention to it. Nothing would make us more pleased than to be able to build a project here.

ELMO DONZE: I would like to direct these comments to the Congressional delegation. The focus tonight has been on cost/benefit ratios. Basically, will the Federal government get its money back? I think the Federal government is participating in a lot of things that have questionable cost/benefit ratios. U.S. banks, backed by the U.S. Government, have lent more than 349 billion dollars to foreign countries. Many third world, many communist. We have about as much chance of being repaid there as collecting the Confederate debt from the Civil War.

The United States today is paying for corruption in Mexico, Argentina's debts from the Falkland War, subsidizing Brazil's chicken farmers, paying for the failures of communism in Poland. I find it

strange that our government cannot realize the need to protect one of our finest historical treasures, the foremost showcase of the French-Creole culture in America.

My question is has the Federal government already financed projects of flood control along the river which have contributed to our problems, and does the study point out the effects on Ste. Genevieve.

COLONEL BEECH: The answer to the first part of the question is yes. Each of those studies indicated that there would be an impact in this specific reach. The rest of your question was whether this study spoke to that. I believe it does not specifically, although the other projects in the area are a part of the study report. This study has to stand alone on the benefit/cost ratio, rather than a relationship to the total.

BILL GONTERMAN, CENTER FOR FRENCH COLONIAL STUDIES: I am here representing Margaret Brown. Ste. Genevieve is one of the few places left of the French Colonial culture. It stands like Williamsburg stands to the English culture in the east. There are many replicas of that culture there. The French Colonial development was much more rural, rustic and primitive. They did not build things that would last the times. Ste. Genevieve happens to be one of the few places left. Cahokia is gone, Kaskaskia is gone. If you let Ste. Genevieve go, there will be nothing left for future generations to see of what the French culture was, which was one of the most important backgrounds of this country's settlement. There is plenty of English representation, very little French, even less Spanish.

Mr. Gonterman read a letter from Margaret Brown. The letter is included in the PUBLIC VIEWS AND RESPONSES section of this report.

I am also representing Crosby Brown, a historical architect who has done some work in the community. He was formerly the Chief of the Missouri State Historical Sites and did the restoration of the first Missouri Capitol at St. Charles. He states: "Ste. Genevieve is not of importance for only local or state history. It is unique and of national significance, because it represents probably, next to Santa Fe, the most important archeological site west of the Mississippi River. Most of the physical features of the early French Colonial times are already lost, Cahokia, Kaskaskia, Chartreuse. But Ste. Genevieve offers structures visible for future generations. This is of national scope, not regional, not local, offering invaluable information not available elsewhere, exhibiting the early settlement and the lifestyles of the French Colonial period. If this is to be preserved for the future generations, you must protect Ste. Genevieve."

VERN BAUMAN, LEVEE DISTRICT 3: The entire Mississippi River from the Missouri to the Ohio has major levees on the Illinois side, and some on the Missouri side. It seems like the job is about 90% done. What we are forgetting about is a few little towns in Missouri. The Missouri and

Illinois bluffs are about four miles apart, the Prairie Du Rocher levee protects about three miles and the river has but one mile to rise here just north of Ste. Genevieve. Can information on the effects of federal projects like this be put in the report, which may relate that it does cause some additional flooding that we haven't had in the past?

COLONEL BEECH: Let us see if we can add something in our report that will speak to that.

BERNIE SCHRAM, PRESIDENT OF THE FOUNDATION FOR THE RESTORATION OF STE. GENEVIEVE: I think that what has been clearly demonstrated here tonight is a fundamental unity of opinion. The Corps of Engineers thinks we should have a levee for historic preservation. We think we should have a levee for historic preservation and for self preservation.

We're in the position, it seems to me, of being an experiment of historic significance. I think this is the first time the Corps of Engineers has gone out and attempted to justify a major project along the river on purely historical preservation grounds. I congratulate them for having placed a magnificent weapon in our hands and splendid information and tools to agitate along political grounds. The Colonel was barred by other sets of rules from suggesting that you write your Congressman. I am not barred by those rules. We are in the position of Romeo and Juliet. The bride is willing, the groom is willing and the family stands in the way. And I think that the family that we have to appeal to are our three fathers, our three white fathers in Washington. Father John Danforth, Father Tom Eagleton and Father Bill Emerson. This becomes a qualitative rather than a quantitative issue. There is no way on God's green earth we can rebuild these houses. The Corps went into cost factoring how much the timbers would cost. You're not ever going to get a cost/benefit ratio. This is a moral issue. If we are worthy of preservation, then we ought to raise hell with our Congressmen and our Senators to attempt to get it for us, because the Corps of Engineers cannot do any more for us than they've already done. Please don't build any more levees to funnel the water in here, but we appreciate very much what you've done. I think it's been a magnificent job. I don't think that we should thrash you for the errors of your predecessors any more than you should flood us for our blindness in the past. But I think that it's a political situation now. The rules either have to be changed, or funding gotten from somewhere else. And the only way we're going to get it is if we in Ste. Genevieve and the area make enough noise to get the attention of Washington.

COLONEL BEECH: Thank you.

JOYCE BECKERMAN: We rarely see a dredge boat in the Ste. Genevieve area any more, and years ago they used to come often. If you would dredge the river it could hold more and maybe we wouldn't get as much footage.

COLONEL BEECH: At one time the St. Louis District had 12 dredges. We presently have two and next year we will be down to one. That is a function of the stone dikes in the river, which are canalizing the river and making it self-cleaning, which results in less requirement for dredging which is very expensive.

The cross sectional area changes so dramatically when the river gets out of the banks, that the amount of dredging does not have a measurable effect on the flood stages.

GREG SCHWENT: I would like to address my comments to the representatives from our Congressmen. The Levee District knows that a major levee is going to be a long drawn out affair. We are now looking for stop-gap measures to battle some of the smaller floods. If you could come to us with some ideas on getting small amounts of funding we would appreciate it.

COLONEL BEECH: I spoke to Congressman Bill Emerson several weeks ago. He was already trying to find a way to provide some relief. Senator Danforth and Senator Eagleton have also been very concerned.

REV. RICHARD THUR: What is the cost of building the levee and averaging out that cost per year.

COLONEL BEECH: The total cost, as we would suggest that it might be a good way to provide flood protection, is about 31 million dollars. In round numbers the annual cost of the project is 3 million dollars.

COLONEL BEECH: Recapped the findings of the study and thanked the audience for their hospitality.

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
MID-CONTINENT REGION
DENVER, COLORADO 80225

MAILING ADDRESS:
Post Office Box 25387
Denver Federal Center
Denver, Colorado 80225

STREET LOCATION
603 Miller Court
Lakewood, Colorado
Telephone 234-2634

IN REPLY REFER TO:
D6427

JUL 17 1978

Colonel Leon E. McKinney
District Engineer, St. Louis District
U. S. Army Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Colonel McKinney:

This is in response to your letter of May 26 requesting our assistance in finding a solution to the continued flooding of the Ste. Genevieve National Historic Landmark.

Following receipt of your request we contacted our Office of Archeology and Historic Preservation in Washington and received the enclosed material documenting the Federal Government's involvement in the nationally significant Ste. Genevieve Historic District. In addition, please note OAHP's statement offering to provide assistance to the Corps and others in developing a flood control project which will protect and enhance the historical values.

We also contacted the Midwest Regional Office of the National Park Service regarding its interest in protecting Ste. Genevieve. The enclosed reply of June 27 documents the interest of the Park Service, not only in the existing designation as a National Historic District, but also the possible addition of Ste. Genevieve to the National Park System.

As you know, the Secretary of the Interior's November 30, 1977, report to the Congress, pursuant to Section 8 of P. L. 91-282, identified the threat to Ste. Genevieve and recommended that flood protection be implemented without delay.

It is obvious that the nationally significant historic values of Ste. Genevieve should be protected. Likewise, the responsibility for protecting such values from flood damage logically rests with the Corps of Engineers. Our inability to devise a system for calculating a favorable benefit/cost ratio by traditional methods seems irrelevant.

This is a situation where the environmental benefits clearly outweigh any purely economic deficits. As such, a positive recommendation to the Congress is fully justified within both the President's water policy and the Water Resources Council's principles and standards for planning.

In view of the above, we firmly believe that your report should recommend that Congress authorize the Corps of Engineers to design and construct an environmentally compatible flood control project which will protect and enhance the historic values of Ste. Genevieve. This office stands ready to assist in the planning of such a project and to provide assistance to those agencies and interests involved in further preservation programs once flood protection has been assured.

Please feel free to use any of this material in preparing your report. Should you desire any additional information or support, do not hesitate to ask.

Sincerely,

Robert Albins

for: Derrell P. Thompson
Regional Director

Enclosures

cc w/enc & inc: NPS, Omaha
HCRS, WASO

Received from OAHP
7/3/78

ST. GENEVIEVE

The comments which follow have been prepared following your request of May 30 on the subject of St. Genevieve, Missouri. As an addendum, we have enclosed national historic landmark descriptive information as well as a map of the location of historic structures in St. Genevieve.

I. Brief History:

French Settlements began to appear along the Mississippi and tributary rivers by the end of the seventeenth century. South of St. Louis on a flat, fertile, alluvial plain, French towns sprung up on both banks of the river with communal lands surrounding the villages. St. Genevieve was first established in 1732 and was later moved from bottom land to higher ground between 1785 and 1790. When western Louisiana passed from French to Spanish control, St. Genevieve grew to a settlement of 180 houses (1,163 inhabitants) by 1800. In 1803, when the Louisiana Territory was purchased by the United States, the importance of the town declined and St. Louis became the principal city in the area. In addition to the Creole flavor of some of the older buildings, there are structures that reflect the influx of a number of Germans during the mid-nineteenth century but it is primarily known for its eighteenth century ranch houses. Early construction techniques, as well as its settlement pattern, have made St. Genevieve one of the finest examples of an eighteenth century French town extant in the United States and, as such, an irreplaceable resource.

II. Federal Historic Preservation Interest:

In 1960, the St. Genevieve Historic District was designated by the Secretary of the Interior as a national historic landmark because of its exceptional value and national significance. The designation has led to considerable private restoration efforts of key structures in the District. Because of its significance, the Historic American Buildings Survey (HABS) recorded structures in the District in the late 1930's. The HABS drawings are catalogued and located in the Library of Congress.

In recent years, the Corps has kept the Office of Archeology and Historic Preservation (OAHP) abreast of the flood problems expecially the damage reported after the 1973 flood. Proposed solutions and studies which the Corps has been considering have also been transmitted to this office. As a result of the 1973 flood

which left two important historic structures unsalvageable, in 1977 the St. Genevieve Historic District was included in the Secretary of the Interior's report to Congress entitled "National Park Service: Threatened Natural Landmarks and Nationally Significant Historic Places" (House Document 95-264-Part 1), with a "magnitude of threat" of "1," the highest possible under the Secretary's guidelines.

We view St. Genevieve as a town which has remained a living historic community and a significant historic resource and therefore of primary importance to the Service's mandate to preserve the environment. Although one can only place an intrinsic value on a community's historic importance, we firmly believe that St. Genevieve's outstanding qualities present an opportunity for the Corps to make a specific exception to its standard procedures of making its judgements solely on a cost-benefit analysis.

In our view, the evidence is indeed overwhelming that the community be the recipient of flood protection by the Corps. To do less would likely result in the loss of this historic resource town as part of this Nation's cultural patrimony.

We stand ready to assist the Corps to insure that an environmentally and historically compatible flood control project is undertaken. We applaud the Corps concern thus far and are most encouraged by its understanding of the value of St. Genevieve to the American people. Working with the State Historic Preservation Officer (SHPO), Orville Henderson, HCRS would be pleased to provide technical assistance to the Corps and others in the pre-planning and post project phases.

It is our hope that such a project will be forthcoming.

MISSOURI (cont'd)

Site: Ste.Genevieve Historic District

County: Ste. Genevieve

NPS Region: Midwest

Ownership: Foundation for Restoration of St. Genevieve Historic District

Significance: Old French river town which has retained much of its 1735 atmosphere.

Magnitude of Threat: 1

Description of Threat: Threatened by floods; two historic houses were lost in 1973 due to flood. Protection against flooding needs to be accelerated or entire area will be lost.

Site: Louis Bolduc House

County: Ste. Genevieve

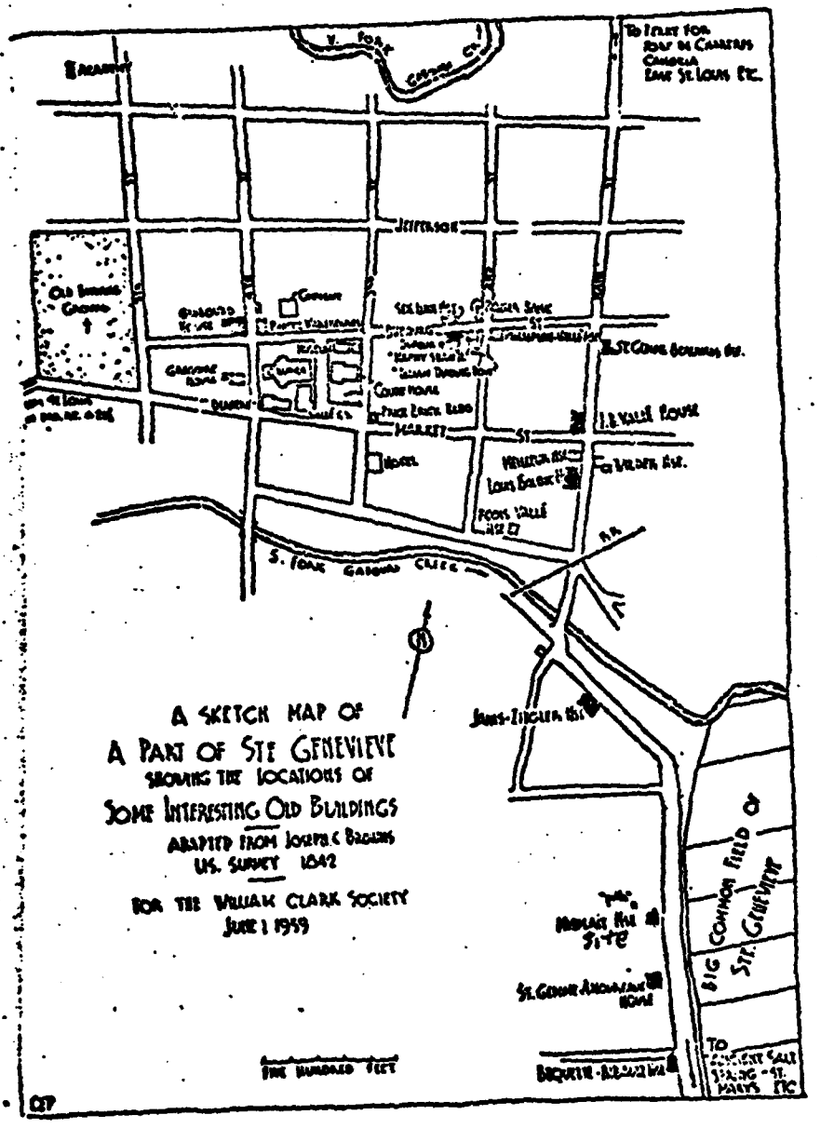
NPS Region: Midwest

Ownership: Colonial Dames of America

Significance: House exhibits French-Canadian and Caribbean influences.

Magnitude of Threat: 2

Description of Threat: While the house is well maintained, damage from floods is inevitable. Flood protection plans should be implemented without delay.



Surviving French Colonial Houses in Ste. Genevieve, Mo.

Site Already Classified and Importantly Related to this Theme*

Ste. Genevieve Historic District, Missouri

Location: Ste. Genevieve County, on Merchant and Main Streets, and Old St. Marys Road, Ste. Genevieve.

Ownership: Various

Statement of Significance

Ste. Genevieve, with its eight existing 18th century dwellings, is the finest surviving architectural example of a French Colonial village in the United States.

History

The date of the first French settlements in the vicinity of Ste. Genevieve cannot be determined. The earliest known grants of land were made in 1752, when 27 inhabitants owned about three miles of Mississippi River frontage. The original site of settlement, probably in the period 1735-40, was in the river bottom on the west bank of the Mississippi about three miles below the present town. Floods, notably one in 1785, caused repeated damage, and the town was moved gradually between 1785 and 1796 to the present site on high ground. By the latter year, only a few huts of traders remained at the old site. In 1772 the town had about 70 houses, one church, and a population of 691. In 1795, at its new location, the inhabitants numbered 839. Ste. Genevieve-the principal seat of government in the region for many years after western Louisiana passed from French to Spanish control in 1762-thrived under Spanish administration, and by 1800 it had 180 houses and 1,163 inhabitants. In 1803, the Louisiana Territory passed to the United States and Ste. Genevieve then declined as St. Louis gradually grew in importance.

Condition

The eight surviving 18th century structures that illustrate the architecture of the French Colonial period are as follows:

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* Site classified under Theme V, French Exploration and Settlement.

1. Bolduc House: Located at 123 South Main Street, this one-and-a-half story frame house was probably erected about 1785 by Louis Bolduc, properous lead miner, merchant, and planter. Constructed of poteaux-sur-sole (posts on the sill), with bouzillage (clay and grass) wall filling, this restored house is one of the finest and least changed examples of French Colonial architecture in the United States. The house is open to visitors.

2. Jean Baptiste Valle House: Located at the northwest corner of Main and Market Streets, this one-and-a-half story frame dwelling was probably erected about 1785 by Jean Baptiste Valle, the last commandant of the Ste. Genevieve District. The basic construction is similar to that of the neighboring Bolduc House, but the Valle House underwent considerably more modification in the mid-19th century. The house is a private residence.

3. Vital St. Gemme de Beauvais House: Located at 20 South Main Street, this frame, clapboarded, one-story house was probably built about 1786. The oldest half of the dwelling is an example of poteaux-en-terre (posts in the earth) construction, and the remainder is built with posts on the sill, resting on a stone foundation. A massive stone chimney originally divided the interior into two equal parts. The present rear wing is modern and the original hipped roof and exterior have also been considerably altered. The house is not open to visitors.

4. Parfait Dufour House: Located on the south side of Merchant Street between Third and Fourth Streets, this one-story frame house was erected sometime between 1789 and 1800. The dwelling is of upright log construction and the exterior is covered with clapboard siding. The house is not open to visitors.

5. Guibourd-Valle House: Located on the northwest corner of Fourth and Merchant Streets, this one-and-a-half story frame house was probably built about 1800. The dwelling is of poteaux-sur-sole construction, and has front and rear galleries. The exterior is clapboarded.

The structure is of particular interest to architectural historians because the rear walls contained two pairs of nine-lighted casement windows, the only known original examples of French Colonial fenestration surviving in the upper Mississippi Valley. The original hipped roof has been considerably altered. The house is used as a private residence and is not open to visitors.

6. Janis-Ziegler House or The Green Tree Tavern: Located at 244 Old St. Marys Road, the structure was probably built sometime between 1800 and 1804. The one-story frame structure measures 75 by 45 feet and is a transitional building of poteaux-sur-sole construction that is combined with original Anglo American roof trusses. The building is open to visitors.

7. St. Gemme-Amoureaux House: Located on the west side of St. Marys Road, 1/3 mile south of South Gabouri Street, this one-and-a-half frame structure was built about 1785. Of poteaux-en-terre construction, it originally had a steep pitched hipped roof that was covered with thatch. The original roof was altered, and front and rear galleries, together with clapboard siding, were added in the early 19th century. The structure is open to visitors.

8. Bequette-Ribault House; Located on the west side of St. Marys Road, 1/2 mile south of South Gabouri Street, this one-and-a-half story frame farmhouse was built on this site about 1775. Of poteaux-en-terre construction, the dwelling originally had a hipped roof and galleries on all four sides. The end galleries have been removed and the roof remodeled. The house is not open to visitors.[1]

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[1] In addition to the above, there are also three more houses of poteaux-sur-sole construction in Ste. Genevieve. The three buildings, all greatly altered and not open to visitors, are as follows:

(1) Francois Valle II House, 167 South Gabouri Street, built about 1786;
(2) Gabriel Boyer House, 140 South Seventh Street, erected about 1800;
(3) LaLumendiere House, 801 South Gabouri Street, constructed in the early 1800's.

United States Department of the Interior

NATIONAL PARK SERVICE
MIDWEST REGION
1709 JACKSON STREET
OMAHA, NEBRASKA 68102

IN REPLY REFER TO:

D6427 MWR DCL

JUN 2 7 1978

Memorandum

To: Regional Director, Mid-Continent Region, Heritage Conservation and Recreation Service, Denver

From: Regional Director, Midwest Region

Subject: Flood Protection, Sainte Genevieve, Missouri

This is in response to Assistant Regional Director Baldwin's June 15 memorandum requesting the view of this Office in support of the flood protection for Sainte Genevieve, Missouri. We understand that the traditional "non-historic" flood control benefits of Sainte Genevieve were not sufficient to justify the expenditure of the construction costs of each of the flood control plans formulated.

Sainte Genevieve is virtually all that remains of a considerable French community in that section of the United States. Other parts have been destroyed by floods or by a change in river course. The Louis Bolduc House dates from 1785 and may be one of the oldest in the Mississippi Valley. The Jean Baptiste Valle House is from the same time and the Green Tree Tavern was built in 1790. Both the Bolduc House and the Jacques Dubreuil Gibourd House, built about 1800, are national historic landmarks and are listed in the Historic American Building Survey. The Secretary of the Interior's Advisory Board has found that the entire historic district has national significance. The National Park Service has included the Sainte Genevieve Historic Distric on the list of sites for study as possible additions to the National Park System.

Though it would assist in computing cost-benefit ratios, no acceptable system has been devised to put price tags on the nation's historic and other environmental resources. Nonetheless, a variety of legislation emphasizes that these values must be considered. The President's June 6 message to Congress on Water Policy says that "Projects should have met national economic benefits unless there are environmental benefits which clearly more than compensate for any economic deficit." We believe Sainte Genevieve is an instance where the environmental benefits - preserving a nationally significant historical district - will outweight the added costs necessary to construct flood protection.

We hope this will be of assistance to you in supporting the Sainte Genevieve flood control project.

Merrill D. Beal
Regional Director

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

MAR 13 1979

Colonel Leon McKinney
District Engineer, St. Louis District
U.S. Army Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Colonel McKinney:

The Mid-Continent Regional Office, Denver, has previously responded to your proposed flood protection project for the Sainte Genevieve Historic District in Missouri. That resume supports your recommendation that the traditional methods for economic benefit evaluation be waived in favor of environmental enhancement. This conclusion is based upon the national significance of Sainte Genevieve and the environmental quality of the site, which overshadows any national enconomic development analysis.

I wish to lend my full support to this approach and commend you for recognizing this unique situation. The Heritage Conservation and Recreation Service endorses the recommendation that Congress authorize the Corps of Engineers to design and construct an environmentally compatible flood control project that will protect and enhance the historic values of Sainte Genevieve. We stand ready to assist in the planning and implementation of such a project.

These nationally significant cultural properties deserve this type of consideration and the Nation will be enriched by protecting and ~~saving~~ this area.

Sincerely,

Chris Therral Delaporte
Director

CITY OF STE. GENEVIEVE

165 S. FOURTH STREET STE. GENEVIEVE, MISSOURI 63670

TELEPHONE (314) 883-5400 OR (314) 883-2760

PD-U

June 6, 1983

Colonel Gary D. Beech
District Engineer
St. Louis District, Corps of Engineers
210 Tucker Blvd., North
St. Louis, Missouri 63101

Dear Colonel Beech:

The City of Ste. Genevieve and Levee District #3 of Ste. Genevieve County and other interested parties have met with the Corps of Engineers on many occasions over the past few months and years with the hope of getting federal protection from the terrible floods that have beset this historic community.

At a meeting on May 31, 1983, the Corps of Engineers described three plans that provide protection from Mississippi River flooding, reduce flooding on North and South Gabouri Creeks, and provide some recreation features. The City and Levee District #3 endorse Plan 1 as presented at this meeting, and hereby express our intent to participate as the non-federal co-sponsor of this plan.

The Corps of Engineers has explained both the items of non-federal cooperation required in the past: such as lands, easements, utility relocations, and bridge replacements; operation and maintenance; and long term replacement of equipment: and the increased non-federal cost sharing desired by the present national administration. It is our intent to fulfill the requirements for non-federal cooperation that are determined to be necessary to implement Plan 1.

It may be of interest that during the recent Ste. Genevieve planning effort, we reconsidered the plan endorsed by the City and Levee District #3 on January 15, 1980. We now consider Plan 1, as presented at the May 31, 1983 meeting, a better plan from both the community and the historical standpoints.

The major floods that Ste. Genevieve has suffered in December 1982, and April and May 1983, have made it even more apparent to us, and we hope to you and other government officials, that we need to proceed with construction of this project as soon as possible. If a project had been in place for the last ten years, millions of dollars in damages, a great deal of suffering, and damages to irreplaceable historic buildings would have been avoided. Ste. Genevieve is a community with nationally and

internationally important historical treasures. We cannot allow these treasures to continue to be flooded, or worse, to be destroyed by higher floods that are certainly a possibility. Please complete the Ste. Genevieve study as quickly as possible.

Sincerely,

Ervin M. Weiler

Ervin M. Weiler
Mayor, City of Ste. Genevieve

Vernon J. Bauman

Vernon J. Bauman
President, Levee District #3

Ste. Genevieve

Chamber Of Commerce

Ste. Genevieve, Missouri 63670

July 7, 1983

Colonel Gary D. Beech
District Engineer
St. Louis District, Corps of Engineers
210 Tucker Blvd., North
St. Louis, Missouri 63101

Dear Colonel Beech:

As you are aware, Ste. Genevieve is a community with nationally and internationally important historical treasures. The community contains some of the most important original Creole homes on the North American continent.

The devastating floods which continue to ravage Ste. Genevieve threaten these historic structures. The downtown area of Ste. Genevieve has been designated a National Historic District by the U.S. Congress.

We cannot allow these treasures to continue to be flooded, or worse, to be destroyed by higher floods that are certainly a possibility.

The City of Ste. Genevieve desperately needs protection from these floods. The Chamber of Commerce has endorsed the flood protection plan developed by the Corps of Engineers to protect our historic town.

The purpose of this letter is to inform you that the Chamber of Commerce wants very much for this plan to be approved at the Corps' Regional Office in Vicksburg.

Please pass this letter along to your superiors.

We appreciate the hard work and dedication of the St. Louis Office of the Corps of Engineers and you in particular for the concern you have shown for Ste. Genevieve.

Cordially,

Larry Vogt, President
Chamber of Commerce

LV: rm

reserving The Past ☆ ☆ ☆ ☆ *Planning For The Future*

CENTER FOR FRENCH COLONIAL STUDIES

Centre pour l'étude du pays des Illinois

R.R. 1 • Box 12
Prairie du Rocher, Illinois 62277

PD-C

April 10, 1984

Colonel Gary D. Beech
District Engineer
Dept. of the Army
St. Louis Dist. Corps of Engineers
210 Tucker Blvd.
St. Louis MO 63101

Dear Colonel Beech,

The Center for French Colonial Studies was founded to coordinate research on the French presence in the Middle Mississippi valley. Of cours, Ste. Genevieve is very important in this context.

Not only is the organization interested in the cultural aspect, but also how this contributes to the present economic and social life of the community. The French heritage of Ste. Genevieve is not merely an historical event, but a continuing economic resource and benefit through tourism. Economic development of the Ste. Genevieve area and the adjoining southern Illinois area is linked with the cultural heritage. Ths type of economic benefit is difficult to analyse for cost benefit ratios, but definitely should be given strong consideration in your study.

Protection from flood damage to historic structures would contribute to the economic stability of the entire area. We recommed that these economic factors be emphasized. As suggested on page 55 of the draft report, flooding contributes to the lack of economic development in the area.

Sincerely,

Margaret K. Brown

Margaret K. Brown
President

Margaret K. Brown
President
618-284-3303

Winstanley Briggs
Vice President
312-664-4366

J. W. Gonterman, Jr.
Secretary-Treasurer
314-535-3397

Chamber of Commerce

Ste. Genevieve, Missouri 63670

PRESERVING THE PAST

April 24, 1984

Members of Congress
United States Capitol
Washington, D.C.

Dear Members:

What price flood protection?

Some things are priceless. When they are lost, like an extinct animal, they are removed from the annals of mankind.

Such are the priceless structures of Ste. Genevieve, an historic river town that is home to some of the most authentic French Creole homes on the North American continent.

Whether the price is $31 million -- or $300 million -- it is a small price to pay when we consider the alternative: the loss forever of these centuries-old relics of our nation's past.

Each year, thousands of tourists and historians visit Ste. Genevieve to walk back into an earlier time, to stand inside the museum houses of French traders and merchants, to touch a living history outside the textbooks.

The plan that you at the Corps of Engineers in St. Louis have so thoroughly proposed is, of course, expensive. But expense must be judiciously measured against the painful loss of these irreplacable structures.

The proud people of Ste. Genevieve implore our elected representatives in Washington -- elected officials who daily feel the power and glory of living history in the halls of our nation's capitol -- to fund this important flood protection project for a town vital to the country's conscience.

We are the stewards of history. We must preserve it, cherish it, protect it and, one day, hand it over to the responsible hands of our children.

Right now, the protection of our historic town, from the mighty ravages of the Mississippi's consistent floods, is in your hands. We place our faith in you to do what is right.

Sincerely,

Ralph W. Morris

Ralph W. Morris, President
Ste. Genevieve
Chamber of Commerce

Editor and Publisher
Ste. Genevieve Herald

VING FOR THE FUTURE

U.S. Department of Housing and Urban Development
St. Louis Office, Region VII
210 North Tucker Boulevard
St. Louis, Missouri 63101

April 27, 1984

Colonel Gary D. Beech
District Engineer
U.S. Army Engineer District
210 North Tucker Blvd. North
St. Louis, MO 63101

Dear Colonel Beech:

SUBJECT: Draft Environmental Impact Statement, Ste. Genevieve, Missouri, Flood Control Study (March 1984)

One of the earliest examples of the uses of history along the Mississippi River is recorded by the French settlers who founded the village of Ste. Genevieve. During their first 50 years of frontier existence they endured territorial hardships as well as minor river floods. However, in 1785 the Mississippi River cut loose and severely inundated their growing community. With the profundity obtained from residing in a pristine environment the French evaluated the river disaster. In trading with the Indians they were told of the river waters that reached from bluff to bluff and when farming the Common Big Field they uncovered remnants of materials deposited from previous floods. These early settlers heard and read the history of the Mississippi River and they disassembled their homes and relocated to higher lands.

Today, almost 200 years later, Ste. Genevieve is once again confronted with the challenges of inundation. However, these recent recurring floods are generally the outgrowth of various manmade causes. Prescribed protective construction works upstream and downstream from the community as well as improper land use management have jointly resulted in increasing flood heights and flood damages to this unobstructed open area. It is even questionable whether protective works would be adequate. The history of flood control indicates that regardless of technical provisions made, some day, some way, the flood control system will fail. Regretfully, the danger of flood works failure is always present.

Recognizing these conditions it is recommended that the U.S. Army Corps of Engineers continue with their skillful evaluations for preserving the environmental unity and historic character of Ste. Genevieve. Perhaps a greater interchange on structural relocation

should be valuated. With increasing flooding in the Ste. Genevieve area site retention might not be in the best interest for the deteriorating historic structures. Relocation might be the practical alternative which could provide the optimum refuge for the existing historic resources. Naturally in relocation every attempt should be made to retain and reinforce the uniqueness of the project area. In the intervening time the importance of community pre-flood planning, emergency preparedness, and temporary flood control measures cannot be overstated.

In the grand rush down the main road we sometimes lose sight of proper alternatives. The economics of mass production have overwhelmed the variety and frugality that arise from concerned actions. As repeatedly emphasized throughout your documented feasibility report, we must continue to preserve the best models from the past. We may need them again. It is with this understanding of our national historic needs that the relocation alternative has been offered.

Sincerely,

Walter L. Eschbach

Walter L. Eschbach
Environmental Officer

1024 East McCarty
Post Office Box 895
Jefferson City, Missouri 65102
314/635-6877

MISSOURI HERITAGE TRUST

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Patrick H. Steele, Sr.
Hermann

May 3, 1984

Colonel Gary D. Beech
District Engineer
Army Corps of Engineers
210 North Tucker Blvd.
St. Louis, MO 63101

Dear Colonel Beech:

Missouri Heritage Trust and the Missouri Arts Council were the co-sponsors of the 1982-1983 architectural survey of Ste. Genevieve, Missouri. Our survey team inventoried over 1,000 buildings and found that over 400 of these buildings met the criteria for inclusion in the National Register of Historic Places.

The major portion of this significant collection is within the 1966 National Historic Landmark District. A significant portion of this district falls within the flood areas as delineated on Plate 3 of the March 1984 Draft Feasibility Report.

The significance of this District is national, even international in scale. No one can question that something must be done to protect and preserve this area for the benefit of present and future generations of Missourians and Americans.

A standard cost-benefit analysis is simply inadequate to deal with the need to protect a unique cultural resource such as this Ste. Genevieve Landmark District. An environmentally compatible flood control project is essential for the preservation and enhancement of the irreplacable cultural resources in Ste. Genevieve.

Sincerely,

Patrick H. Steele, Sr.

Patrick H. Steele, Sr.
Director of Preservation Services

cc: Dr. Osmund Overby
Midwest Office of National Trust for Historic Preservation: Cheryl Ingram
Bernard Schram
City of Ste. Genevieve

A not-for-profit, tax-exempt, membership organization, incorporated to promote and coordinate historic preservation activities throughout Missouri.

Foundation for Restoration

P.O. Box 88
Ste. Genevieve, MO 63670

May 8, 1984

Col. Gary Beech
District Engineer
Army Corps of Engineers
210 North Tucker Blvd.
St. Louis, Mo/ 63101

Dear Col. Beech:

On behalf of the Foundation for Restoration, I wish to commend your office for its outstanding Flood Control study with its emphasis on the historic significance of Ste. Genevieve.

We feel that this splendid report places in proper perspective the importance of historic preservation as an intrinsic heritage unrelated to commercial value. The fact that your District undertook the research leading to such a conclusion displays a sensitivity and appreciation of our vanishing physical environment that is praise worthy.

It hardly needs saying that all of us who cherish our pioneer town urgently support appropriate flood control for Ste. Genevieve as a national historic landmark.

Anything we can do in the interest of furthering this project we shall do willingly.

Meanwhile, we wish once more to express our profound gratitude to you and your associates for your understanding and sympathetic approach to our problems.

Sincerely yours,

Bernard K. Schram,
President

1024 East McCarty
Post Office Box 895
Jefferson City, Missouri 65102
314/635-6877

MISSOURI
HERITAGE TRUST

9 May 1984

Colonel Gary D. Beech
District Engineer
Army Corps of Engineers
210 North Tucker Blvd.
St. Louis, MO 63101

Dear Colonel Beech:

As a citizen of this state, I am expressing my concern about the flood control program at Ste. Genevieve.

I believe it imperative to protect the built environment so threatened by flooding. Ste Genevieve has such a unique place in the cultural heritage of our nation and our state that I urge you to consider changes in the existing cost-benefit criteria so that the levee project may be undertaken. I do not believe that a dollar amount can be applied to the benefits of preserving a portion of our heritage as singular as Ste. Genevieve.

Sincerely,

Helen Barnett

Helen Barnett
Dir. Adm. Services

A not-for-profit, tax-exempt, membership organization, incorporated to promote and coordinate historic preservation activities throughout Missouri.

5-9-84

Dear Sir
The City of Ste. Genevieve is very much in need for a levee for flood protection.
All the homes that get flooded from the mississippi and also The Big Field land which is very good for crops, the town of Kaskasia got a grand to To add on to their levee, which is just across the River from Ste Genevieve, that will bring more flooding to this town.
I would live in the flood area! why because I am stuck with a home and Can't get Rid of it.

Thank you

Mrs Sophie Sprane
345 Washington St
Ste Genevieve, Mo. 63670

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
324 EAST ELEVENTH STREET
KANSAS CITY, MISSOURI - 64106

May 10, 1984

Colonel Gary D. Beech, USA
District Engineer
U.S. Army Engineer District, St. Louis
210 Tucker Boulevard, North
St. Louis, Missouri 63101

Dear Colonel Beech:

Flood Control Study for Ste. Genevieve,
Ste. Genevieve County, Missouri

My staff has completed their review of the feasibility report and draft Environmental Impact Statement for the project identified above. We have rated this project and draft statement LO-2, respectively. This rating means we have no significant objection to the project, however, the final EIS document should provide more specific information relative to the following comments.

Levee Placement

#1 Although the first iteration measures included levee locations close to the community (Measures 1 thru 4), each of these measures afforded only partial protection and were thus rejected for further consideration in the plan formulation process. It is unclear why consideration was not given to a combination of these measures. It would seem that a single levee on or adjacent to and paralleling the railroad would afford sufficient levels of protection. This option would leave most of the floodplain outside of the levee, with a resulting reduction in flood height and floodplain development impacts.

Aquatic Resources

We noted that discussion of the environmental setting of the project area concluded that North Gabouri, South Gabouri and Valle Spring Branch Creeks are not seriously polluted and are fairly typical of small streams draining agricultural areas (pages F-10 and EIS-25). The report also noted that although the lower reach of South Gabouri Creek received occasional discharge of mining wastes, this discharge ". . . is detrimental to the creek but is not considered a serious problem."

However, discussions of the environmental impact of the various alternative plans in the draft EIS conclude that impacts on the aquatic resources would be minimal due to the already degraded nature of the
#2 stream (pg. EIS-36). We do not believe this logic, which occurs at various locations in the report, is consistent with the description noted earlier. Neither do we believe the assessment of impacts should be based on these currently existing conditions, but should be based on the attainable beneficial uses of the waters. Data presented in Section 1.2.2 of Appendix F clearly show that a significant aquatic community exists and could be maintained within this segment of the creek.

Thank you for the opportunity to review and comment on this draft document. Please send us three copies of the final EIS when it is completed. If you need futher information about our comments, you may contact Lynn Kring of my staff. He may be reached at 816-374-5593 or FTS 758-5593.

Sincerely yours,

Charles H. Hapinian

Charles H. Hapinian
Chief, Environmental Review Branch

St. Louis District's Response to
United Stated Environmental Protection Agency
Letter Dated May 10, 1984

#1 Measures 1 through 4 flank North and South Gabouri Creeks and independently protect the north, center, or south parts of the community. They are presented individually, but can be considered in various combinations. A levee alignment adjacent to the railroad would require gravity drains and pumps to handle flows from North and South Gabouri Creeks. This alignment is considered to be infeasible because significant ponding areas would not be available and enormous pump stations would be needed to handle flows from North and South Gabouri Creeks when the Mississippi River is high. Plans 1, 2 and 3 utilize very large ponding areas.

#2 The report has been revised to comply with comments received.

CITY OF STE. GENEVIEVE

165 S. FOURTH STREET STE. GENEVIEVE, MISSOURI 63670

TELEPHONE (314) 883-5400 OR (314) 883-2760

May 10, 1984

Dave Rahubka
St. Louis District
Corps of Engineers
210 North 12th St.
St. Louis, MO 63101

Dear Dave:

On behalf of the Mayor and Board of Aldermen, I am writing this letter regarding the Corps' Flood Control Study For Historic Ste. Genevieve. The Corps is to be commended for the effort put forth in completing the comprehensive study.

It is obvious that the Corps has an excellent understanding of the present and potential future flooding problems that Ste. Genevieve is experiencing. However, it is disappointing to learn that no action to alleviate flooding can be recommended by the Corps of Engineers through the normal program based upon the economic criteria. Despite this recommendation the Study points out that due to the value of historic structures in the community, there should be a Federal interest in providing flood protection.

Naturally, the City's position is that a flood protection project is justified for the community for two basic reasons. First, the unique historic structures in the community are of local, regional and national historical significance. Of course, a normal economic analysis does not take into consideration the importance of preserving these buildings. The local feeling is that any analysis that does not take the historic nature of the community into account is incomplete.

It seems inconsistent that strict Federal regulations require environmental assessments prior to many construction projects to insure that historic archeological sites are preserved, while at the same time no assistance can be provided in preserving valuable historic structures that are intact. If Federal policy disregards economic analysis when protecting the endangered "snail darter", it seems reasonable to expect that preserving significant historic structures should at least merit consideration.

The second reason to justify Federal participation in providing flood protection are the number of levees that have been constructed along the Mississippi River by the Corps. These levees have had an impact on the amount of water that Ste. Genevieve receives during periods of flooding. The City's position is that because this construction has had a negative effect on Ste. Genevieve, the Corps may have a legal obligation in providing flood protection.

Relating to the proposed levee design, it is understood that the plan was to protect against a "500 - year flood", therefore requiring a sophisticated pumping system, recreational areas and other "frills". Since this "urban
#1 design" drove the cost above the $30 million level, it is recommended that an alternative that would provide lesser protection be studied, thus making the project more feasible.

There is a great deal of frustration in the community over the inflexibility of the Corps' flood protection program. The sophisticated design and the level of protection have caused the project cost to be so high that it is not economically feasibile.

Local sentiment would be for assistance in providing protection against the thirty to fifty - year flood, rather than to be faced with the "all or nothing at all" Federal guidelines we are faced with. The community has taken several steps to minimize flood damage in the last year. The raising of Fourth Street and the construction of the Third Street Levee will provide a great deal of protection against the level of flooding we have received recently. These efforts have been successful because several segments of the community worked together for their completion.

We plan to continue these efforts. It would be beneficial if the Corps would be directed to provide a flexible, realistic and justifiable plan for flood protection. There must be alternativ approaches to a $30 million levee system that cannot be recommended for funding. The historic value of Ste. Genevieve should be worth further investigation of possible flood protection activities.

Sincerely,

Phillip S. Vawter

Phillip S. Vawter
City Administrator

St. Louis District's Response to
City of Ste. Genevieve
Letter Dated May 10, 1984

#1 Lesser protection was studied. Several alternative levee alignments designed to protect to the 30-year flood plus 3 feet of freeboard and the 100-year flood plus 3 feet of freeboard are presented in the report. None of these plans were economically justified. These smaller levees as well as as the 500-year flood levees were designed using standard Corps of Engineers design criteria that require a substantial levee cross section, permanent pump stations, seepage wells, berms, concrete closure structures at roads and railroads, and other features where appropriate.

Ste. Genevieve County
LEVEE DISTRICT NUMBER 3
Ste. Genevieve, Missouri 63670

Department of the Army
St. Louis District, Corps of Engineers
210 Tucker Boulevard, North
St. Louis, Missouri 63101

May 10, 1984

Re: Flood Control Feasibility Study for Ste. Genevieve

Since its founding shortly after the devastating flood of 1973, Ste. Genevieve County Levee District Number 3 has been working to secure flood protection for the historic city of Ste. Genevieve.

After these many years, the recent feasibility report, prepared by the Corps of Engineers concludes "that no Federal action by the Corps of Engineers is warranted when examined under our economic justification criteria".

The hard work, the countless meetings, the studies, the plans----have only resulted in a negative recommendation.

The thorough, in-depth study concludes the benefits which would result from the selected levee plan fall far short of the construction costs. The members of this Levee District cannot refute this fact.

However, on behalf of the Levee District, I ask the Corps of Engineers and the United States Congress to consider again the priceless structures which may be lost forever if the devastating floods continue to race unchecked through the historic city.

How can funding be denied when the study itself contains statements such as: "flooding of the historical buildings in Ste. Genevieve is a matter of local, state, National, and international concern". Further, the study concludes, "Historic preservation in Ste. Genevieve is in the Federal interest".

On Behalf of Levee District Number 3, the people of Ste. Genevieve, and all who treasure the priceless heritage that is Ste. Genevieve's alone, I appeal for Federal funds to finance the much needed flood protection for this historic city.

I further ask that this statement be made a part of the official record of public comment.

Art Schwent

Art Schwent,
Secretary

BILL EMERSON
MEMBER OF CONGRESS
8TH DISTRICT, MISSOURI

HOUSE COMMITTEE ON
AGRICULTURE

HOUSE COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS

Congress of the United States
House of Representatives
Washington, D.C. 20515

OFFICES:
SUITE 418
CANNON BUILDING
WASHINGTON, D.C. 20515
202/225-4404

THE FEDERAL BUILDING
339 BROADWAY
CAPE GIRARDEAU, MISSOURI 63[illegible]
314/335-0101

614 PINE
P. O. BOX 639
ROLLA, MISSOURI 65401
314/364-2455

May 11, 1984

Colonel Gary Beech
U. S. Army Corps of Engineers
St. Louis District
210 N. Tucker Blvd., North
St. Louis, MO 63101

Dear Colonel Beech:

I am writing to support many of the recommendations included in Section 5 of the recently released Ste. Genevieve flood control feasibility study. As I understand from the public meeting, and the report itself, the historical value of the resources represented in Ste. Genevieve by the unique architecture was not given a dollar value in assessing the benefit-to-cost (b/c) ratio within the confines of the study.

I concur with your observations that "historical preservation in Ste. Genevieve is in the Federal interest and substantial flood protection has been found to be a necessary part of any general effort to protect and enhance the historical resource in the community."

It is my hope that the Board of Rivers and Harbors, when reviewing your recommendations, will present to Congress a report giving opportunity for participation by other federal and non-federal agencies in a flood control protection plan for this community. The economic justification criteria used by the Corps of Engineers which did not include a dollar value on the French Colonial and other historical resources should be re-evaluated if at all possible to include those dollar values; and the subsequent benefits to the community at large by the enhanced economic environment for the flood-prone area.

I would like to commend the Corps on the detailed analyses given to the historical aspect, but would certainly like to see options left open for participation by other federal agencies and a criteria being established which would allow for a dollar value on the items beforementioned. It is my opinion that if this were done, the possibility of a better b/c ratio could be projected, and a more presentable package for the Congress to act upon would be in place.

Thanking you for this opportunity to have input on this most important project, I am

Sincerely,

Bill Emerson

Bill Emerson
Member of Congress

BE/lp

May 16, 1984

Urban Studies Branch
Planning Division

Honorable Bill Emerson
House of Representatives
418 Cannon House Office Building
Washington, D.C. 20515

Dear Mr. Emerson:

Thank you for your letter of May 11, 1984 commenting on our draft Ste. Genevieve report.

You are correct in your understanding that unique architectural and historic values were not accounted for in our economic benefit/cost analysis. We have coordinated extensively with historic interests and found no general agreement on a suitable technique for determining the dollar value of protecting historic buildings from flooding.

In the draft Ste. Genevieve report we have attempted to thoroughly and professionally, but separately, address economic and historic concerns as they relate to flood protection. We have presented the economics of various flood protection plans from the National Economic Development standpoint. We have also examined the National Historic Landmark District at length and described the unique benefits of protecting this resource from flooding. It is our hope that this information will give other Federal and non-Federal agencies an opportunity to provide flood protection for Ste. Genevieve.

Our final report, which will be forwarded to our Division office in June, will include your letter and others so that they may be taken into consideration during the review process and by the Congress. Thank you again for your continuing interest and your support of our effort.

Sincerely,

Gary D. Beech
Colonel, Corps of Engineers
District Engineer

Copy Furnished:

Home address

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 176 Jefferson City, Missouri 65102 (314) 751-4422

May 11, 1984

Colonel Gary D. Beech
Corps of Engineers
District Engineer
210 Tucker Boulevard, North
St. Louis, MO 63101

Dear Colonel Beech:

The Ste. Genevieve, Missouri, Feasibility Report--Flood Control Study, has been received and reviewed by state agencies having responsibilities within the area.

The historical and recreational value of Ste. Genevieve can be significantly protected from flood damage only by structural techniques. Nonstructural flood damage reduction measures, although beneficial in some locations, obviously would not offer proper protection for the first settlement on the west bank of the Mississippi River.

#1 The need for levee protection is more easily understood when consideration is given to increased flooding effects caused by downstream and across the river levees which offer 50-year flood height level protection compared to the existing 10-year protection for Ste. Genevieve. Levee protection would be advantageous but no commitment of state funding is implied with this expression of need for the levee.

Although located totally within Missouri, Ste. Genevieve has national and also international significance which indicates those benefits normally considered as "local" would indeed be international. This proposal has some unique conditions and therefore it may require special funding considerations.

Thank you for the opportunity to comment.

Sincerely,

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Ron Lucera

Fred Lafser
Director

FAL:cme

Christopher S. Bond Governor
Fred A. Lafser Director

St. Louis District's Response to
Missouri Department of Natural Resources
Letter Dated May 11, 1984

#1 The town of Ste. Genevieve does not have "existing 10-year protection." The town has a few small levees that protect parts of the community, but unprotected areas are subject to flood damages from the 5-year Mississippi River flood and the 2-year floods on North and South Gabouri Creeks. Confusion may have arisen because Section 2.3.19 of the report states that an agricultural area between Ste. Genevieve and Kaskaskia Island is protected by a levee that is overtopped by approximately a 10-year Mississippi River flood. This agricultural levee does not provide protection for the town of Ste. Genevieve. See PLATE 2 of the MAIN REPORT.

UNIVERSITY OF MISSOURI-COLUMBIA

College of Arts and Science

Department of Art History and Archaeology
109 Pickard Hall
Columbia, Missouri 65211
Telephone (314) 882-6711

May 11, 1984

PD-C

Colonel Gary D. Beech
District Engineer
St. Louis District, Corps of Engineers
210 Tucker Blvd., North
St. Louis, Missouri 63101

Dear Colonel Beech:

I am writing to comment on the Corps of Engineers' Flood Control Feasibility Study for Ste. Genevieve, Missouri, dated March 1984. I have discussed these comments with my colleagues in the Ste. Genevieve research project here at the University which is referred to in several places in your study. I should first of all commend your staff for their very thorough examination of the historic and cultural aspects of Ste. Genevieve, and their sensititivy to the preservation of these resources.

The Feasibility Study rightly calls attention to the historic ambience of Ste. Genevieve, and to its cultural importance. In large part, this ambience is due to the town plan that was laid out in the 1780s, which is one of the most important elements of the French heritage of Ste. Genevieve. Buildings later than the French period are important not only in their own right as representative of later periods in the town's history, but also because they preserve the form of that original town plan, and therefore contribute to the historic French ambience of the community. With this in mind, our architectural survey of Ste. Genevieve, will recommend the preservation of many more buildings than were previously identified. As the Corps' study reports, as of February 1983 we had expanded the #1 list to 154 historic buildings of which 87 were subject to flooding. Now, as our study nears completion, it is clear that we will recommend well over 400 buildings for preservation, of which more than 230 are subject to flooding.

The discussion of the attrition of historic buildings and of preservation opportunities in the Feasibility Study is excellent. I saw first hand the heroic make-shift efforts of people in Ste. Genevieve in the face of the floods of the past two years. Clearly flood protection would be an important spur to private investment in historic preservation and lead to the enhancement of the cultural resources of the community.

an equal opportunity institution

Our Ste. Genevieve project has made us very aware of the significance of the archaeological sites, both historic and prehistoric, lying to the east and south of Ste. Genevieve. The Feasibility Study also takes note of these. While we agree that Plan 1 best satisfies the objectives of the flood control study, it does not seem to offer protection to most of the archaeological area. We would urge that further attention be given to mitigation and protection for these sites.

Sincerely yours,

Osmund Overby
Professor of Art History

OO:jc

St. Louis District's Response to
University of Missouri - Columbia
Letter Dated May 11, 1984

#1 The Feasibility Report was revised and it notes the current findings of the University of Missouri project, i.e., over 400 buildings recommended for preservation, of which more than 230 are subject to flooding. However, since our study was essentially complete when the figures were received from the University, these data were not analyzed in detail. The report shows maps and detailed flood information on the interim figures provided by the University, i.e., 154 historic buildings of which 87 are subject to flooding. Any future consideration of flood protection for Ste. Genevieve should be made with the realization that larger numbers of historic buildings are subject to flooding.

CONSULAT GENERAL DE FRANCE

A CHICAGO

May 12, 1984.

Dear Colonel Beech:

Mr. Gilles de la Belleissue who has left for Paris for a new assignment a few days ago had visited the beautiful town of Ste. Genevieve last November.

I was never in Ste. Genevieve myself, but Mr. de la Belleissue mentioned to me several times that he was very much impressed by its scenic beauty and by the authenticity of the homes built there during the early French settlement. I also know that he had marveled at the fantastic restoration work that had been done.

Without any doubt, Mr. de la Belleissue would have endorsed any initiative and effort aimed at preserving all remants of the French presence in the Middlewest.

Sincerely,

PIERRE BERNIARD
ACTING CONSUL GENERAL

Colonel Gary D. Beech
District Engineer
Army Corps of Engineers
210 North Tucker Boulevard
St. Louis, Mo. 63101

KOETTING'S FOODWAY

20 PLAZA DRIVE

STE. GENEVIEVE, MISSOURI 63670

10-4

5/13/84

Colonel Beach
Corps of Eng. St Louis
Dear Sir:

We as business people in the Ste Genevieve Community see the proposed levy from a lot of different angles. - What it does to the historical homes what it does to the lives that live in them - others who live in the flood area that own their own homes - How it effects the farmers whose land is constantly flooded.

To elaborate a little on the above - I belong to the Foundation for Restoration whose main purpose is to save the 100 or so historical structures from being torn down or otherwise being distroyed by the floods. As you are well aware many scholars from all over the nation come to study about our homes to determine more about our National Heritage. the people who live in them try to preserve them but with the increased number of times the river floods them its impossible to maintain them even (over)

Pointe Basse PLAZA

M H FOOD STORE

in a livable condition.

Then the poorer folks who must live in the flood zone because their home is there and this is all the home they have and can't afford to leave it, they may be renting in this area again because of their financial position they can't afford higher rents and each time they are hit with another the worse off they become.

The Farmers too with land in the flooded area lose their crops almost yearly now occasionally is not the best but yearly they can't stand.

All these things effect the community's well being, which we notice more than anyone else being in the food business. Without good crops for the farmers and the folks of the city spending all their money to try and maintain a home the economy of Ste Genevieve is hurt more and more

As I understand it Ste Gen is one of the few places left along the Mississippi that is not flood protected and here we are with the historic treasures of our land being washed away. Think — Mr Government Man what you are doing to us —

We've been in business in Ste Genevieve since 1887 and we do know what the situation is here.

Respectfully Submitted

Koetting Foodway

John F. Koetting

Christopher S. Bond
Governor

John A. Pelzer
Commissioner

State of Missouri
OFFICE OF ADMINISTRATION
Post Office Box 809
Jefferson City
65102

Perry M. McGinnis, Director
Division of Budget and Planning

May 14, 1984

Colonel Gary D. Beech
District Engineer
Department of the Army
St. Louis District
Corps of Engineers
210 North Tucker Boulevard, North
St. Louis, Missouri 63101

Dear Colonel Beech:

Subject: 84040021 - Ste. Genevieve, MO Feasibility Report
Flood Control Study for Historic
Ste. Genevieve - 80061

The Missouri Federal Assistance Clearinghouse, in cooperation with state and local agencies interested or possibly affected, has completed the review on the above project application.

None of the agencies involved in the review had comments or recommendations to offer at this time. This concludes the Clearinghouse's review.

A copy of this letter is to be attached to the application as evidence of compliance with the State Clearinghouse requirements.

Sincerely,

Lois Pohl, Coordinator
Missouri Clearinghouse

LP:cm

cc: Southeast Missouri Regional Planning Commission

CE-PD
PD-4

LANDMARKS
ASSOCIATION OF ST. LOUIS INC.

721 Olive Street
Room 1113
St. Louis, Missouri 63101
(314) 421-6474

May 14, 1984

Gary D. Beech, Colonel, CE
District Engineer
St. Louis District, Corps of Engineers
210 Tucker Boulevard, North
St. Louis, MO 63101

Dear Colonel Beech:

I am pleased to be given the opportunity to comment on the Draft Flood Control Study for Ste. Genevieve, Missouri. It appears to be an excellent report and I congratulate the Corps for this effort. I would urge, however, that every opportunity to find funds for the work so essential to the protection of this valuable resource be fully explored. Economic justification criteria must be weighed in light of the continued erosion which will result from no action. Federal involvement is not only warranted, it is imperative.

Sincerely,

Carolyn Toft

Carolyn H. Toft

CHT:mr

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Carolyn Hewes Toft

Campbell Design Group
Architects Engineers Planners
Formerly Campbell & Wieland

PD-4

May 14, 1984

Colonel Gary D. Beech
District Engineer
Army Corps of Engineers
210 North Tucker Boulevard
St. Louis, Missouri 63101

RE: Flood Control Study
Corps of Engineers
City of Ste. Genevieve

Dear Colonel Beech:

In recent communication with Mr. Phillip S. Vawter, City Administrator for the City of Ste. Genevieve, Missouri we learned that the Corps had recently completed a flood control study for Ste. Genevieve; further we were informed that the proposed levee cannot be recommended under the current cost-benefit criterion.

In view of the flood control protection projects that have been completed, are now in progress, or are now being planned, the need to protect the unique historic district in Ste. Genevieve from flooding of the Mississippi River is exacerbated.

Please include the correspondence with your final report for the Ste. Genevieve study as an indication of our concern that the unique, historic structures in Ste. Genevieve be made safe from the periodic flooding of the Mississippi River by whatever means that might be appropriate and justified.

Very truly yours,

CAMPBELL DESIGN GROUP

Joseph D. Madlinger, P.E.
Principal

JDM/cjl

CC: Mr. Phillip S. Vawter

1316 Convention Plaza St. Louis, Missouri 63103 314/231-4747
Horseheads, NY Kansas City, MO Alton, IL Wellsboro, PA Darmstadt, FRG

AD-A161 291 STE GENEVIEVE MISSOURI FEASIBILITY REPORT (FLOOD CONTROL STUDY FOR HISTOR..(U) ARMY ENGINEER DISTRICT ST LOUIS MO J ZEREGA ET AL. MAR 85 4/4

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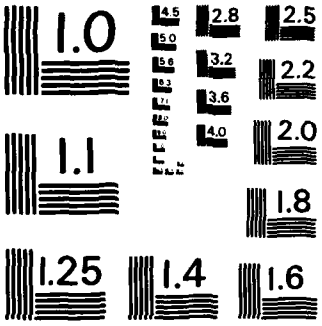

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

BANK OF STE. GENEVIEVE

STE. GENEVIEVE, MISSOURI 63670

May 15, 1984

Colonel Gary Beech
St. Louis District Engineer
U. S. Corps of Engineers
210 North Tucker Blvd.
St. Louis, Mo. 63101

Dear Colonel Beech:

Having a sustaining interest in the commercial, residential and industrial properties of this community and area, I want you to know that I very much support the proposed $31 million flood protection project for the community of Ste. Genevieve. I recognize the support and effort you and the Corps have given this project and feel that you should be commended for all the energy and effort exhibited on our behalf.

It seems that practically every year the lower levels of Ste. Genevieve are exposed to a flood or, equally as bad, the threat of a flood which threatens the commerce, residents and numerous points of interest of this historic city. The proposed flood protection project would add significant value to the currently unprotected historical residences and historical treasures exposed to the horrible destructive waters. Additionally, not only would the tax base of this community be significantly enhanced by the proposed flood protection, but visitors to our historical homes and prestigous restaurants would no longer have to question the accessibility of our streets during the popular tourist season of the year. It has come to my attention that numerous interested tourists suspect the historical area of our community to be inaccessible months after the flooding recedes.

Please keep up your good work and I support your valiant efforts to come to the rescue of our community.

Respectfully yours,

Harold J. Uding
Executive Vice President

Serving The Community Since 1902

PHONE: 314-883-3501

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

MAY 16 1984

Colonel Gary D. Beech
CE
District Engineer
St. Louis District, Corps of Engineers
Department of the Army
210 Tucker Boulevard, North
St. Louis, MO 63101

Dear Colonel Beech:

Thank you for your notice of March 23, 1984, of a public meeting and a copy of the Draft Flood Control Feasibility Study (Study) for Historic Sainte Genevieve, Missouri. We have reviewed the Study and your determination that no Federal action by the Corps of Engineers is warranted under the Corps' economic justification criteria. We do not agree with this conclusion.

The Study reflects your awareness of the significance of the Sainte Genevieve National Historic Landmark District, the Louis Bolduc House, and the Common Field Archeological Site as well as of the danger posed to these properties by flooding along the Mississippi River and North and South Gabouri Creeks. The Study also identifies numerous "historic preservation opportunities" and other benefits that would result from carefully designed flood control measures, including increased property values, new development on formerly flood-prone land, community spirit, and tourism.

Indeed, the Study presents a convincing argument in favor of preserving the historic resources for use by current and future generations. Having done so, however, the Study then simply cites implementation costs that exceed the assigned dollar value of the benefits as the basis for a decision to take no action. Given the importance of Historic Sainte Genevieve, the Council questions the appropriateness of such strict adherence to economic criteria to justify inaction. If cost/benefit analysis must be sole basis for the Corps' decision, it is only logical to insist that the economic values and benefits of the resources be fairly established for comparison with the costs of their protection. The Study fails to do this, acknowledging that ". . . no satisfactory method of this kind exists . . ." (Volume Two, page E-38).

The Corps' decision to use only economic criteria to judge the appropriateness of action demands that suitably comprehensive and sophisticated methodology be used to assign values to benefits. At a minimum, such analysis should reflect such factors as the added value to the tax base arising from protection, the number of jobs generated, the annual income related to increased tourism, the amount of money already invested in the rehabilitation of properties and the extent to which this rate of investment would increase if flooding were controlled.

On pages A-64 and E-40 of Volume Two of the Study, the Corps determines that taking no action to prevent flooding at Historic Sainte Genevieve would constitute neglect of the National Register properties resulting in their deterioration or destruction, a criterion of adverse effect cited in the Council's regulations (36 CFR Part 800). At the same time, according to Table 12 (Volume One, page 9) of the Study, the Corps identifies three flood control plans that would protect most of the historic buildings, have no adverse effect on the visual and aesthetic character of the historic properties, enhance opportunities for rehabilitation and restoration of historic buildings, and be only moderately likely to affect archeological sites. It is our belief that more serious consideration should be given to implementing such plans to alleviate the adverse effects associated with flooding.

As stated in the National Historic Preservation Act, it is the policy of the Federal government to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation. With the hope that you will reconsider your decision that the subject protective measures are unwarranted, the Council stands ready to assist the Corps in its development of plans to protect historic resources from flooding.

Sincerely,

Thomas F. King
Director, Office of Cultural
Resource Preservation

TERRY R. ROTTLER
ATTORNEY & COUNSELOR AT LAW
296 Market Street
P. O. Box 307
Sainte Genevieve, Missouri 63670

Telephone
(314) 883-5793

May 17, 1984

Mr. Dave Rahubka
U.S. Army Corps of Engineers
St. Louis District
210 N. 12th Street
St. Louis, Missouri 63101

Re: Ste. Genevieve Levee Proposal

Dear Sir:

I am a life-long resident of the City of Ste. Genevieve, Missouri and I now practice law in an office on the courthouse square in Ste. Genevieve. The City of Ste. Genevieve is, of course, the County Seat of Ste. Genevieve County and the center of all business, industry, commerce, and government in that community. As one who has invested quite a bit of my past and hope to invest much of my future, both personal and professional, in that community I feel I have a vested interest in the continuation of Ste. Genevieve as a viable city.

In the past few years we have experienced a number of serious, devastating floods which have caused significant damage to many key portions of our town. Most notable have been floods in 1973, 1979 and of course, the most recent occurrences of December, 1982 and April, 1983. Those parts of town that have been reached have been seriously harmed. The areas in question have become somewhat of a depressed area. Many of those homes and buildings that were seriously damaged have not been fully repaired. One assumes the owners must feel they have no assurance that further damage will not be incurred later on down the line. We are naturally quite concerned when we see the grades being shot for an estimate of what the 100 year flood would do to our community.

As indicated before, my office is right on the square and I apparently would have flood water on my doorstep. My office is not a historic building. On the contrary, in its former life it was a 1940s vintage gas station. However, our community is blessed with a large number of historically significant buildings. Buildings which are the real thing; an orginal, not a reproduction. In this day and age our country seeks to deal with and manage the forces of change. I have been on this earth for 32 years and certainly during that brief period constant, tumultuous change has been the rule rather than the exception in American life. When has it ever been more important to recognize and appreciate, understand and enjoy our past and our history? Probably never. Ste. Genevieve is a living community which has in its midst a legacy from our forefathers. A legacy that cannot really be reproduced and is only now beginning to be properly studied and evaluated. It defies logic, it

defies reason, to assert that that legacy has no value. One of the primary reasons man is on this earth is to lay the groundwork and prepare a path for the future generations. I believe we have an obligation to our future generations to preserve that very path, that groundwork which was prepared by our predecessors.

Certainly during your study of our project someone has brought up the matter of the levee at Kaskaskia and its potential effect of increased flooding in Ste. Geneveive. I need not dwell on that technical factor. However, the village of Kaskaskia is not the original. The original village of Kaskaskia, the subject of the history books, the site of the French settlement, one of the westernmost American colonial victories in the Revolutionary War, lies beneath the Mississippi River. Perhaps the only remnants of that legacy is the now famous bell enshrined in the present village of Kaskaskia. It boggles the mind to think of the treasures that were lost and could now be available if that original village could have somehow been protected and saved from the river.

I urge the Corps to reconsider its recent report recommending against the implementation of the Ste. Genevieve Levee Project and further urge your agency and its personnel to do all possible to, on the contrary, recommend said project for prompt and expedited funding by the Congress of the United States.

Thank you for your time and consideration.

Sincerely,

Terry R. Rottler

TRR:nk

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 84/502

MAY 1 8 1984

Colonel Gary D. Beech
District Engineer, St. Louis District
U.S. Army Corps of Engineers
210 Tucker Boulevard, North
St. Louis, Missouri 63101

Dear Colonel Beech:

The Department of the Interior has reviewed the draft Ste. Genevieve, Missouri, Feasibility Report, Flood Control Study for Historic Ste. Genevieve, which includes the draft environmental impact statement. We find that the document adequately addresses the significance of the historic resources in the study area and offers sound structural and non-structural methods to resolve further destruction of these resources by future Mississippi River flooding events. However, we note with some regret that application of the traditional Corps of Engineers (COE) cost-benefit analysis technique has resulted in a determination that none of the proposed methods would be economically justified. This determination has prompted you to recommend that no further action should be taken by the COE in this matter.

As you are well aware, we feel that the national significance of the resources at Ste. Genevieve warrant special consideration. Since the 1960's, Ste. Genevieve has been recognized as a National Historic Landmark, a status of which is awarded by the Secretary of the Interior only to properties that possess exceptional historic qualities as illustrations of this country's heritage. We appreciate the fact that the COE has attempted to arrive at a system for quantifying the historic value of Ste. Genevieve, but has found the task to be difficult. Nevertheless, we implore you to further consider applying techniques different from the traditional cost-benefit analysis. We further implore you to reconsider your recommendation of no further action, recognizing that "...there are certain non-economic benefits associated with preservation or enhancement of resources that may fully justify some projects" (COE Board of Engineers for Rivers and Harbors, July 1980). We wholeheartedly believe that flood protection for Ste. Genevieve is one of those projects.

Sincerely,

Bruce Blanchard

Bruce Blanchard, Director
Environmental Project Review

HOURS
8:30 A.M. - 12:00 NOON
MONDAYS & FRIDAYS

STE. GENEVIEVE COUNTY COURT
ADRIAN J. EHLER, PRESIDING JUDGE
CARL W. ZERWIG, ASSOCIATE JUDGE 1ST DISTRICT
ROMAN C. ROTH, ASSOCIATE JUDGE 2ND DISTRICT
STE. GENEVIEVE, MISSOURI 63670

May 24, 1984

Colonel Gary D. Beech
District Engineer
St. Louis District, Corps of Engineers
210 North Tucker Blvd.
St. Louis, Missouri 63101

Dear Colonel Beech,

As you are aware, Ste. Genevieve is a community with nationally and internationally important historic structures. The devastating floods which continue to ravage Ste. Genevieve threaten these historic treasures. Two historic homes were lost in the flood of 1973. The City of Ste. Genevieve desperately needs protection from flooding.

One can only place an intrinsic value on a community's historic importance. We firmly believe that Ste. Genevieve's outstanding qualities present an opportunity for the Corps to make a specific exception to its standard procedures of making its judgements solely on a cost-benefit analysis. We further believe that your report should recommend that Congress authorize the Corps of Engineers to construct an environmentally compatible flood control project which will protect and enhance the historic values of Ste. Genevieve.

We appreciate the hard work and dedication of the St. Louis Office of the Corps of Engineers and you in particular for the concern you have shown for Ste. Genevieve.

Sincerely,

Ste. Genevieve County Court

Adrian J. Ehler, Presiding Judge

Carl W. Zerwig, Associate Judge

Roman C. Roth, Associate Judge

Michael E. Bauman, Clerk of Court

The National Society of
The Colonial Dames of America
in the State of Missouri

3 Twin Springs Lane
St. Louis, Missouri 63124
May 29, 1984

Colonel Gary D. Beach
District Engineer
St. Louis District, Corps of Engineers
210 North Tucker Blvd.
St. Louis, Missouri 63101.

Dear Colonel Beach,

I have read, to the best of my ability, "The Flood Control Study For Historic Ste. Genevieve", which was sent to me by The U.S. Army Corps of Engineers. It is an excellent report and complete in all details and should be considered seriously with no delay.

As the President of The Missouri Society of The National Society of The Colonial Dames of America, I am writing to you on behalf of our entire Society. We own three historic homes in Ste. Genevieve. The Louis Bolduc House, The Bolduc Le Meilleur House and The Linden House. Bolduc and Bolduc Le Meilleur are Museums which have been completely restored to the original dates respectively of 1785 and 1814. Both are furnished with authentic French antiques, artifacts and furniture. The Louis Bolduc House has been designated a National Historic Landmark by the United States Department of The Interior, National Park Service. The Linden House is used only by our Members and it is thought to have been built between 1800 and 1805.

Because our Society has valuable, cultural and educational interest in Ste. Genevieve we are strongly in favor that The Flood Control Project ~~be~~ proceed as soon

The National Society of
The Colonial Dames of America
in the State of Missouri

as possible. We are not only concerned and interested about our properties but also of all the valuable history, architecture, homes, museums and archeology in Ste. Genevieve.

The damaging and devastating floods of 1982 and 1983 caused untold destruction to the City, the populace and the historic treasures. The flooding of the Mississippi River at Ste. Genevieve, should be under control to save this interesting and historical site. More floods would be a serious disaster and a great loss, which could never be duplicated.

It is our sincere hope that the Flood Control Project will be undertaken and completed in the very near future.

Cordially Yours,
Georgia Morse Heitner
(Mrs Norman E.)
President, Missouri Society
N.S.C.D.A.

Alliance Française-Maison Française de Chicago

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OFFICE ADMINISTRATOR
Miss Lindsay McGuire

30th May 1984

Colonel Gary D. Beech
District Engineer
Army Corps of Engineers
210 Tucker Boulevard North
St. Louis, Missouri 63101

Sir:

I wish to express my fervent support for the construction of a levee to protect the town of Ste. Genevieve from flooding.

Ste. Genevieve is a treasure of America's past. With its houses, buildings, and streets of the 18th century, it preserves a priceless page of American history. There are very few of those pages left and none in the Midwest that can rival Ste. Genevieve. Historians have long recognized its importance. Now the public is discovering it and coming more and more numerous each year to visit this site, which is a shrine of its heritage.

Articles have appeared in Chicago newspapers. We have given lectures, presented exhibits, arranged tours. The importance and the value of Ste. Genevieve are being recognized with enthusiasm. Even foreign tourists and dignitaries are now asking to visit there. After a long sleep that miraculously preserved its character, Ste. Genevieve is emerging. In time it will take its place as one of the treasured sites of the American patrimony. It is an act of piety to the past and the future, it is a duty to preserve the history enshrined in its streets.

For us representing France, Ste. Genevieve is truly significant. It stands as a testimony of the part played by France in building this country. It is a relic of the alliance between our two nations, the oldest alliance of the United States, one of the most revered of France.

(continued)

218 East Ontario Street Chicago, Illinois 60611 Téléphone (312) 337-1070

Colonel Gary D. Beech
30th May 1984
Page 2

I discovered Ste. Genevieve three years ago with delight and with deep emotion. Few places can evoke the colonial part of the United States with such immediacy. Few places can speak so stirringly of the everyday lives of the people who built this country out of their work, their beliefs, and their hope for a human future.

I add, therefore, my voice to those that have spoken in behalf of Ste. Genevieve. You and the Army Corps of Engineers will be gaining the esteem and the gratitude of many people with this project.

Sincerely yours,

R. de Mélogue
Director

218 East Ontario Street Chicago, Illinois 60611 Téléphone (312) 337-1070

National Trust for Historic Preservation

MIDWEST REGIONAL OFFICE 407 SOUTH DEARBORN STREET, SUITE 710 CHICAGO, ILLINOIS 60605 (312) 353-3419

May 30, 1984

Mr. Dave Rahubka
Department of the Army
St. Louis District Corps of Engineers
210 Tucker Blvd., North
St. Louis, Missouri 63101

Dear Mr. Rahubka

I am writing to oppose the recommendation of the Flood Control Study for Historic Ste. Genevieve-80061, prepared by the Department of the Army, St. Louis District Corps of Engineers. The National Trust for Historic Preservation fosters the preservation of the nation's diverse architectural and cultural heritage for all Americans. The Trust serves the nation by advocating the ethic of stewardship, strengthening local, state and national preservation efforts, influencing public policy and shaping the values and methods of preservation. The Midwest Regional Office of the National Trust has provided field and advisory services to the City of Ste. Genevieve, the Ste. Genevieve Landmarks Commission, the Ste. Genevieve County Court and the Foundation for Restoration for over eight years.

During that time Ste. Genevieve's appreciation of its historic resources and commitment to their preservation has resulted in a self confident community, with a unique identity. It has taken positive steps to ensure that changes to its built environment are carefully evaluated and enhance its historic character. The community has documented over 450 buildings worthy of preservation, nominated structures to the National Register of Historic Places, developed a preservation plan, enacted a local ordinance to review proposed alterations to its historic environment, and created a nonprofit organization to encourage the preservation of the town. Additionally, the community has achieved National Historic Landmark status, a distinction conferred on those historic resources that have transcendent value to the nation as a whole and whose integrity is not compromised. In sum, they have amply demonstrated the local initiative and commitment to preservation in both the public and private sector that Congress has encouraged and recognized as essential to ensuring that our national heritage is not lost.

We appreciate the Corps' recognition of Ste. Genevieve's important historic resources and search for alternative methods of flood protection that would preserve them. We also understand the regulatory constraints the Corp faced in considering the intangible aspects of preservation which do not lend themselves to quantification and lie outside the scope of the standard cost benefit analysis required in evaluating Corps projects. We believe this method of analysis is deficient and cannot accurately reflect the true value of historic resources nor the public benefits that accrue through their preservation. Therefore, we oppose the recommendation that no federal action be taken to protect Ste. Genevieve from further flooding. The cost benefit

Headquarters Office 1785 Massachusetts Avenue, N.W., Washington, D.C. 20036 (202) 673-4000

analysis of the Corps relies on the assumption that the replacement of historic mid eighteenth century buildings with non-historic structures erected in the twentieth century can create the same value. The assumption is incorrect.

In the National Historic Preservation Act of 1966 and later in the 1980 Amendments to the Act, Congress affirmed the necessity and appropriateness of the federal government taking an agressive role in accelerating historic preservation programs and giving "maximum encouragement to agencies and individuals undertaking preservation by private means" 16 U.S.C. 470-470t Title I, Sect. 101, Sect. 1B(7). The Corps recommendation does not give the "maximum encouragement" Congress called for because the basis for decisionmaking has no means of considering those very unquantifiable aspects of the town that Ste. Genevieve seeks to preserve.

Ste. Genevieve is a fragile historic community with opportunities for future private investment and economic development through tourism. Owners of historic income producing properties in Ste. Genevieve, listed in the National Register of Historic Places are eligible for a 25% investment tax credit when substantial rehabilitation is undertaken, through the Economic Recovery Tax Act of 1981. Private investment will be discouraged however if a resolution cannot be found to solve Ste. Genevieve's chronic flooding problems.

Ste. Genevieve's commitment to preservation is demonstrated, now it is time for the federal government to demonstrate its commitment by giving the maximum encouragement it can by considering other beneficial aspects of the project that just those that can be quantified.

The National Trust recognizes Ste. Genevieve's commitment to historic preservation and would like to participate in further deliberations on this project and would appreciate being informed of the progress of your review.

Sincerely,

Holly Trela for Tim Turner

Tim Turner
Regional Director

cc: Phillip Vawter, City Administrator
Bernard Schram, President, Foundation for Restoration
Patrick Steele, National Trust Advisor
William Bruning, National Trust Advisor
Joan Dillon, National Trust Trustee
Senator Thomas Eagleton
Senator John Danforth
Representative Bill Emerson

UNIVERSITÉ LAVAL
CITÉ UNIVERSITAIRE
QUÉBEC P.Q. CANADA
G1K 7P4

PD

Québec, le 30 mai 1984

Colonel Gary Beech,
District Engineer,
Army Corps of Engineers,
210 Tucker Blvd North,
St. Louis, Missouri,
U.S.A., 63 101

Colonel,

J'ai été informé des démarches entreprises par certains de vos concitoyens à l'effet de construire une digue pour protéger le patrimoine historique de Ste-Geneviève, Missouri. J'aimerais me joindre à eux pour vous signaler tout l'à-propos de cette proposition qui vise à protéger l'un des beaux héritages de notre passé.

Ste-Geneviève était, en effet, autrefois, l'une des grandes étapes sur la route des voyageurs qui venaient du Canada pour se rendre à la Nouvelle-Orléans. Son rôle historique, de même que sa valeur actuelle de patrimoine aussi bien national qu'international, rendent nécessaire ce projet.

Confiant dans les suites que vous donnerez à cette proposition, je vous remercie de votre attention et vous prie d'agréer, Colonel, l'expression de mes sentiments les plus distingués.

Courville

Serge Courville, Ph.D.
Professeur au Département
de Géographie

TRANSLATION

UNIVERSITE LAVAL

Cite Universitaire
Quebec, P.Q. Canada
G1K7P4

Quebec, 30 May 1984

Colonel Gary Beech
District Engineer
Army Corps of Engineers
210 Tucker Blvd., North
St. Louis, MO
U.S.A.

Colonel,

I have been informed about steps undertaken by certain of your fellow citizens to effect the construction of a levee to protect the historic patrimony of Ste. Genevieve, Missouri. I would like to join them in pointing out to you the great usefulness of this proposal which aims at protecting one of the beautiful (fine) heritages of our past.

In effect, Ste. Genevieve was in former times one of the major stops on the route of the voyagers who came from Canada on their way to New Orleans. Its historic role, its real value, not only as a national but also as an international heirloom (heritage) make this project a necessity.

Trusting that you will follow through with this proposal, I thank you for your attention and please, Colonel, accept my very best regards.

Serge Courville, Ph.D
Professor, Department of Geography

CITY OF STE. GENEVIEVE

165 S. FOURTH STREET STE. GENEVIEVE, MISSOURI 63670

TELEPHONE (314) 883-5400 OR (314) 883-2760

March 7, 1985

Brigadier General Thomas A. Sands
Department of the Army
Lower Mississippi Valley Division
Corps of Engineers
P.O. Box 80
Vicksburg, Mississippi 39180

Dear General Sands:

The City of Ste. Genevieve and Levee District Number 3 of Ste. Genevieve County strongly support your recommendation that flood protection for the City of Ste. Genevieve be provided by the Federal government.

On June 6, 1983, the City and Levee District wrote to Colonel Gary D. Beech, District Engineer, St. Louis District, Corps of Engineers to express our intention to participate as the non-federal co-sponsor of the Corps' flood protection "Plan 1". Our intention to fulfill the requirements for non-federal cooperation were expressed in this correspondence.

In reviewing the Supplemental Report on Ste. Genevieve, dated March 1, 1985, several requirements that must be provided by local interests are outlined in Section 6. In response to these requirements, the commitments of the City of Ste. Genevieve and Levee District Number 3 are as follows:

A. All lands, easements, rights-of-way, relocations, and bridge replacements, including borrow areas and disposal areas for excavated material, necessary for implementation of the project will be provided without cost to the United States.

B. The United States will be held and saved free from damages due to the construction work, operation, or maintenance of the project, excluding damages due to the fault or negligence of the United States or its contractors.

C. The City and Levee District, will jointly maintain and operate all flood control works. The City of Ste. Genevieve would be responsible for all recreational and environmental works. All areas would be open on an equal basis and in accordance with regulations prescribed by the Secretary of the Army.

D. The City of Ste. Genevieve will provide a cash or in-kind contribution equal to 50 percent of the project cost allocated to recreation.

E. The City of Ste. Genevieve will publicize flood-plain information in the areas concerned and provide this information to regulatory agencies for their guidance and leadership in preventing unwise future development in the flood plain. Additionally, regulations that may be necessary to insure compatibility between future development and protection levels provided by the project will be adopted.

F. Affected interests will be notified on an annual basis about the limitations of flood protection provided by the project.

G. The City of Ste. Genevieve currently enforces flood-plain management regulations prescribed by the Federal Emergency Management Agency relating to the construction of significant structures that may be located in the flood plain, such as residential and commercial structures, bridges, landfills, and channel modifications. Additional regulations will be adopted regarding other encroachments that might adversely affect the hydrologic/hydraulic characteristics and flood-carrying capacities of the selected plan.

H. The City of Ste. Genevieve currently has a Landmarks Ordinance that safeguards cultural resources in the National Historic Landmark District area. These regulations protect, preserve and encourage restoration of historic buildings as well as preserve the historic character of the District through control of existing and new development to insure its compatibility with the historic setting.

It should be pointed out that the City is in the process of revising the Landmarks Ordinance with the intention of providing stricter design guidelines. This is part of the revision process of the City's Comprehensive Plan.

The City and Levee District support the continued agricultural use of the Mississippi River bottomlands for open space and agricultural production.

I. The City and Levee District will comply with the provisions of Section 221 of P.L. 91-611, the Rivers and Harbors Act of 1970.

J. The City and Levee District will comply with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, P.L. 91-646.

If additional information is required, please contact City Administrator Phil Vawter.

Sincerely,

Ervin M. Weiler

Ervin M. Weiler
Mayor, City of Ste. Genevieve

Vernon J. Bauman

Vernon J. Bauman
President, Levee District Number 3

END

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