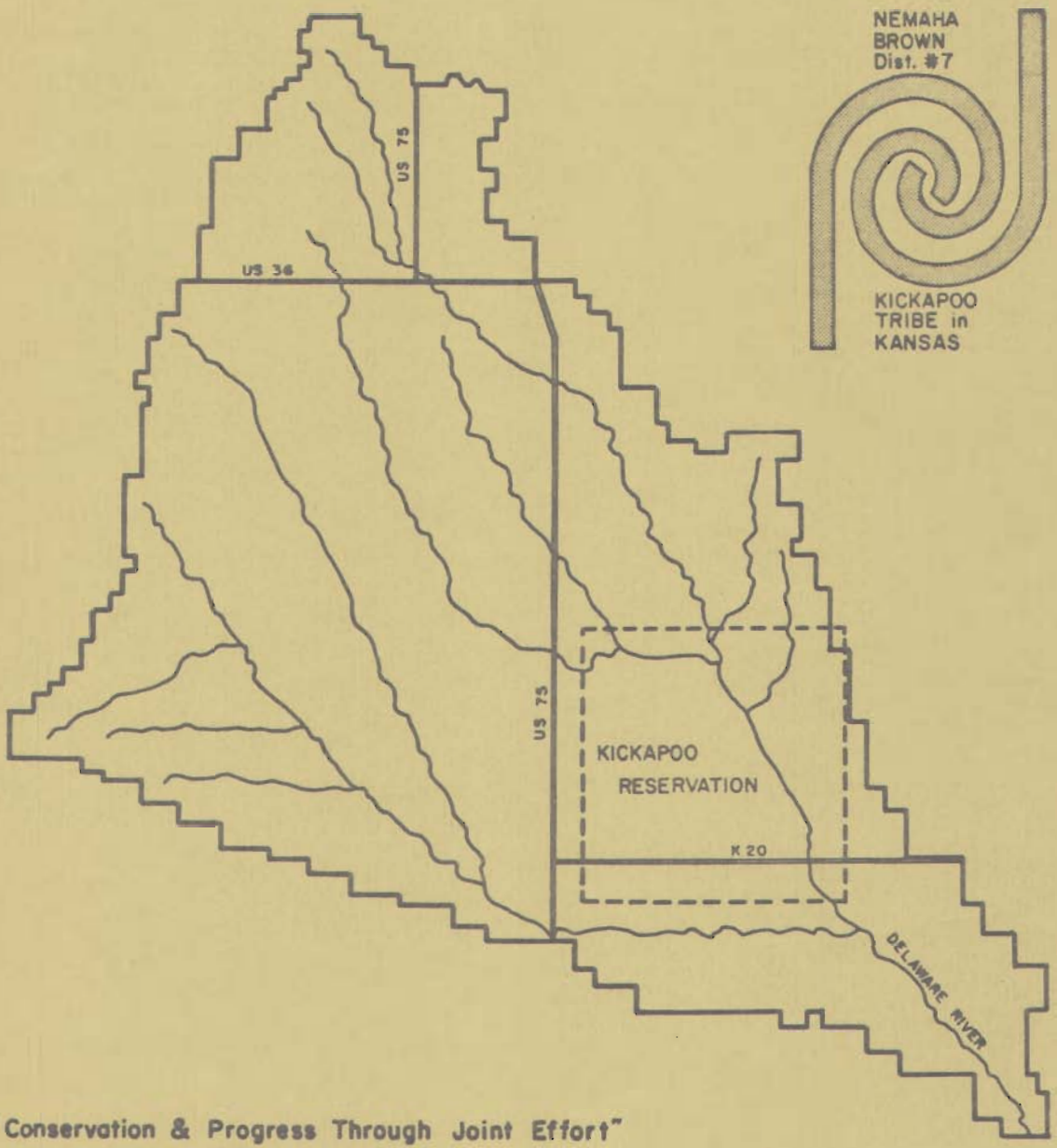
Exhibit 9

TESTIMONY OF LESTER RANDALL, CHAIRMAN, KICKAPOO TRIBE IN KANSAS, IN SUPPORT OF S. 2154, THE KICKAPOO TRIBE IN KANSAS WATER RIGHTS SETTLEMENT AGREEMENT ACT

COMMITTEE ON INDIAN AFFAIRS UNITED STATES SENATE
JULY 18, 2018

NEMAHA-BROWN-KICKAPOO
Joint Watershed Board



"Conservation & Progress Through Joint Effort"

NEMAHA
BROWN
Dist. #7

KICKAPOO
TRIBE in
KANSAS

NEMAHA-BROWN-KICKAPOO
Joint Watershed Board
Route 1, P.O. Box 105 HORTON, KS. 66439
(913)486-2822

June 9, 1983

Mr. Ken Kern
State Conservation Commission
535 Kansas
Topeka, KS 66603

Dear Mr. Kern:

We have compiled the attached information for determining assistance under the Watershed Protection and Flood Prevention Act (P.L. 566) for the Field Examination Team that will be reviewing and evaluating the progress of the Nemaha-Brown-Kickapoo Joint Watershed Board. Included in the attachments are the following sections:

1. General Information: This section includes a brief history of the watershed with particular emphasis on the work that has been accomplished in the last six months.
2. Funding: The Bureau of Indian Affairs has committed $100,000 to complete the first phase of planning. A confirmation of this is included.
3. Letters of Recommendation: A number of letters of recommendation and support from state and local agencies have been received by the Board. These are included as an indication of the widespread support for the watershed.
4. Contracts: During the past few months a number of contracts have been executed that pave the way for the planning process. Copies of each of these have been included.
5. General Plan: A copy of the general plan dated July 1978 is included.

As the progress and attachments demonstrate, the Nemaha-Brown-Kickapoo Joint Watershed Board is dedicated to working towards the completion of the watershed project. We feel the first steps of the process have been taken.

Your support in our project will be greatly appreciated.

Sincerely,

Emery Negonsott

Emery Negonsott
Chairman

GENERAL INFORMATION

GENERAL INFORMATION

The preliminary work for the Nemaha-Brown Watershed Joint District No. 7 began in the early 1950's. At that time Public Law 566 did not permit Indian Tribes to be joint sponsors. In 1974 the Tribe began planning for the construction of several watershed dams on the Reservation. At that time the Tribe chose to work with the same reservoir sites that the Nemaha-Brown Watershed District was including in their general plan. These sites on the Reservation included 4 of the 5 multi-purpose structures that were planned for the watershed.

During the period of 1974 to 1982 the Tribe continued through the process of planning for the construction of the reservoirs on the Reservation. This work included preliminary design, preliminary geology and some land acquisition.

The General Plan for the Nemaha-Brown Watershed was completed in 1978. The plan at that time did indicate the interest of the Kickapoo Tribe in the co-sponsorship of the needed structures.

It was not until 1981 that Public Law 566 was amended to allow Indian tribes to become joint sponsors. At that time the Tribe began to explore the possibility of becoming a joint sponsor.

On February 25, 1983 the first major step was taken to accomplish this with a meeting held at the Soil Conservation Service office in Washington, D.C. The meeting included representatives from the Kickapoo Tribe, Nemaha-Brown Watershed Joint District No. 7, SCS and Bureau of Indian Affairs.

This meeting was a milestone in the development of watersheds because it marked the first time an Indian tribe had requested joint sponsorship. After the meeting, Peter C. Myers, Chief of Soil Conservation Service, sent a letter to the Tribe and the Nemaha-Brown Watershed Board outlining the steps necessary for the formation of a joint watershed board. A copy of that letter is included.

Since the time when the letter was received the Tribe and the Watershed Board have worked to complete each of the steps. Included in this has been the following:

1. Development and signing of an agreement between the two groups to form the Nemaha/Brown/Kickapoo Joint Watershed Board.

2. With the help of SCS, a contract for preparation of the entire PL 566 Planning was developed and signed.

3. The Joint Watershed Board has been working with the Bureau of Indian Affairs for the past six months to initiate the first phase of planning. On June 6, 1983 the Tribal Office received a copy of a memorandum stating that the BIA was processing an allocation for $100,000 to complete the first steps in the planning process. A contract with the engineer to complete this work has been completed and will be signed when the money is received.

Each one of the agreements mentioned above has been included for your review.

The last item in Mr. Myer's letter referred to a priority from the State of Kansas for SCS planning. The Nemaha-Brown Watershed received its first rating on November 19, 1975. Since that time and particularly in the last six months, the Board has made great effort in moving the project forward. This has included numerous meetings, two trips to Washington, D.C. and many hours of preparation. This coupled with the increased land conservation practices in the watershed is an indication of the widespread interest that has developed in the watershed projects in the past several years.

United States Department of Agriculture
Soil Conservation Service
P.O. Box 2890
Washington, D.C.
20013

Mr. John Thomas
Tribal Chairman
The Kickapoo Tribe in Kansas
Route 1, Box 157A
Horton, Kansas 66439

MAR 15 1983

Kickapoo Tribal Office
RECEIVED
MAR 22 1983
DATE

Dear Mr. Thomas:

At our meeting on February 25, 1983, we discussed the possibility of developing a plan for a watershed project for the Upper Delaware River under the authority of Public Law 83-566. As you know, the Soil Conservation Service (SCS) cannot provide planning assistance at this time. We do want, however, to confirm that we can accept plans developed by others, and can provide assistance for implementing them if they meet our criteria and follow established planning processes. If you choose to proceed, you should work with John W. Tippie, our State Conservationist in Kansas, and his staff to receive the guidance you will need to prepare an acceptable plan.

The following are some of the initial steps you should take:

1. Develop and enter into an agreement with the Nemaha-Brown Watershed District for joint sponsorship of plan development and implementation.

2. Obtain guidance from the SCS in Kansas to develop a contract for the preparation of a plan which would satisfy SCS's requirements for a preauthorization planning document.

3. Arrange funding, and jointly with the Nemaha-Brown Watershed District, enter into a contract for the preparation of a watershed plan.

4. Seek a priority from the State of Kansas for obtaining SCS planning assistance.

This will be our first experience having an Indian tribe as a joint sponsor of a watershed project. Although the SCS cannot commit substantial assistance prior to fiscal year 1985, we will provide as much help as we can to guide the preparation of an acceptable plan. You should contact John W. Tippie, State Conservationist, SCS, 760 South Broadway, P.O. Box 600, Salina, Kansas 67404 (Phone 913-823-4565) to obtain this assistance.

Sincerely,

Peter Myers

PETER C. MYERS
Chief

cc:
Craig Mitts, Board of Directors, Nemaha-Brown Watershed District No. 7, Hiawatha, Kansas
Charles P. Corke, Chief, Water and Land Resources, Bureau of Indian Affairs

FUNDING

Kickapoo Tribal Offic
RECEIVED
JUN 6 1983
DATE

Water & Land Resources
Water Resources

JUN 1 1983

Memorandum

To: Area Director, Anadarko Area Office

From: Deputy Assistant Secretary - Indian Affairs (Operations)

Subject: Kickapoo Tribal Water Development Proposal

Your memorandum, this subject, of May 6 transmitted a contract dated April 28 and proposed amendment between the Nemaha/Brown/Kickapoo Joint Watershed Board and Van Doren-Hazard-Stallings, Engineers-Architects-Planners. Attached to the contract as Appendix A is a work outline for the preauthorization planning phase of the P.L. 566 watershed plan.

We understand that the work outline conforms with requirements of the Soil Conservation Service which must monitor the work to assure that it meets all SCS conditions. The funding request was discussed here at a meeting last week. We are processing an allocation of $100,000 to your office from Account 3800/5490 for funding the proposal in accord with your recommendation. You should satisfy yourself that accountability and reporting are specific in implementation of the proposal since there are an abnormal number of interested parties.

We are pleased that the tribe has taken the lead in successfully pursuing the joint sponsorship role. We will follow progress in this unique undertaking.

/S/ John W. Fritz

LETTERS OF RECOMMENDATION

STATE OF KANSAS

OFFICE OF THE GOVERNOR
State Capitol
Topeka 66612

April 11, 1983

Peter C. Myers, Chief
Soil Conservation Service
United State Department of Agriculture
P.O. Box 2890
Washington, D.C. 20013

Dear Mr. Myers:

I am very pleased to lend my endorsement to the co-sponsorship agreement between the Kickapoo Tribe in Kansas and the Nemaha-Brown Watershed District Number 7. This joint application, which is the first of its kind in the nation, exemplifies their spirit of cooperation and willingness to work together to solve problems within their watershed district. I commend the Kickapoo Tribe and the Nemaha-Brown Watershed District Number 7 for their efforts to make this valuable watershed project a reality in Northeast Kansas.

Again, I am pleased to endorse the co-sponorship agreement. If my office can be of assistance, please do not hesitate to contact me.

Sincerely,

JOHN CARLIN
Governor

JC:PH:sje

cc: John W. Tippie
John Thomas
Steve Cadu
Gale Miller
Craig Mitts
Randy Bishop

NBJWD03466

DON MONTGOMERY
SENATOR, TWENTY-FIRST DISTRICT
MARSHALL, NEMAHA, POTTAWATOMIE,
WABAUNSEE, PARTS OF DICKINSON,
GEARY, MORRIS, RILEY COUNTIES
1218 MAIN
SABETHA, KANSAS 66534

TOPEKA

SENATE CHAMBER

VICE-CHAIRMAN, LOCAL GOVERNMENT
MEMBER ASSESSMENT AND TAXATION
JOINT COMMITTEE ON ADMINISTRATIVE RULES AND REGULATIONS
AGRICULTURE AND SMALL BUSINESS
EDUCATION

April 20, 1983

Mr. Gale Miller, President
Nemaha-Brown Watershed Board
District No. 7
Route #4
Sabetha, Kansas 66534

Dear Gale:

I certainly want to add my support to your efforts in cooperating with the Kickapoo Indian Nation in obtaining funds for the Delaware Watershed.

I am a strong believer and supporter of watersheds and know they are a tremendous asset in controlling erosion and keeping water impounded in the proper location. This project will provide a needed water supply for the reservation in the Horton area and also for the town of Sabetha. The saving of the soil that will be provided by this watershed can return many times the dollars that are expended.

Please let me know if I may be of assistance to you through my office or just as an interested supporter.

Sincerely,

Don

Senator Don Montgomery
Twenty-First District

DM:bt

State Conservation Commission

ROOM 1014, 535 KANSAS AVENUE TELEPHONE (913) 296-3600 TOPEKA, KANSAS 66603

March 28, 1983

Mr. Gale Miller, Chairman
Nemaha-Brown Watershed District No. 7
Route 4
Sabetha, Kansas 66534

Dear Mr. Miller:

The State Conservation Commission reviewed the Co-Sponsorship Agreement on P. L. 566 Structures as presented by Gale Miller, Chairman of the Nemaha-Brown Watershed District No. 7, and Steve Cadue, Water Resources Consultant of the Kickapoo Tribe of Kansas, at the regular Commission meeting on March 28, 1983.

The following official action was taken:

> Motion by Roy Seybert to endorse the concept of the Co-Sponsorship Agreement between the Kickapoo Tribe in Kansas and the Nemaha-Brown Watershed District No. 7. Seconded by J. Wendell Eggerman. Motion passed unanimously.

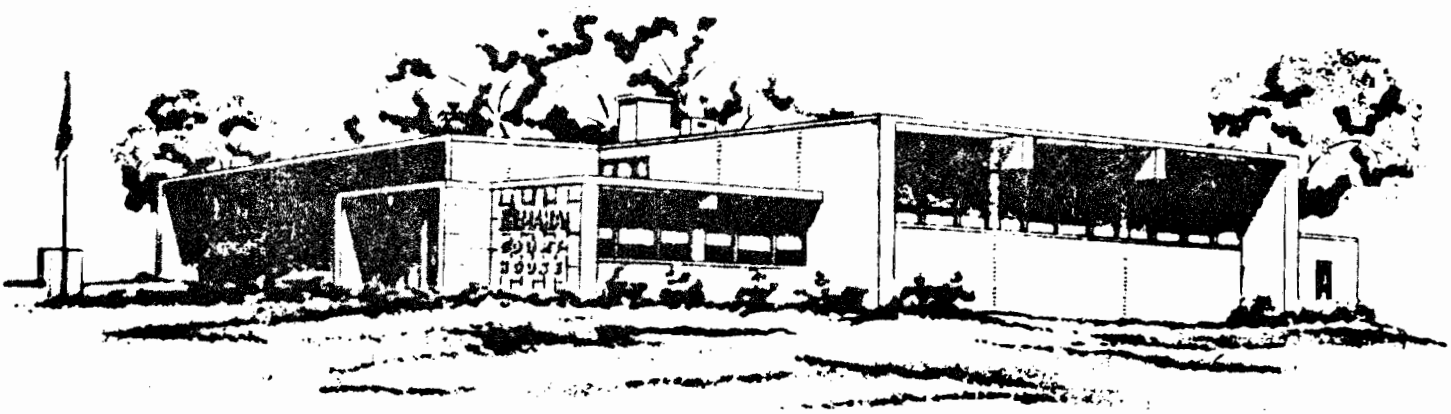
The Commission is pleased to endorse the co-sponsorship agreement.

Sincerely,

John Spurling
Chairman

JS:KFK:lw

CC: Peter C. Myers, Chief
Soil Conservation Service



NEMAHA COUNTY
SENECA, KANSAS
66538

February 22, 1983

JIM D. BROWNLEE, FIRST DIST.
Rt. 3, Sabetha, Kansas 66534
H. F. NIEHUES
Corning, Kansas 66417
G. EVERETT MURPHY, THIRD DIST.
Rt. 2, Seneca, Kansas 66538

Nemaha-Brown Joint Watershed District # 7
% Gale Miller, President

Dear Gale:

We wish to join with other groups in support of their efforts to obtain funds for Nemaha-Brown Joint Watershed District # 7. We feel this project should receive a very high priority because of it's being in one of target areas set out for needed special treatment by the Department of Agriculture.

We believe that funding should include both construction and at least most of the easements.

We know from our knowledge of what has been done in some watersheds that a watershed can have a very beneficial effect on erosion control and protection of a water supply and the environment.

By the Nemaha County Commissioners

Sincerely,

G. Everett Murphy, Chairman

GEM/sh

Jim D. Brownlee, Commissioner

H.F. Niehues, Commissioner

CITY OF Sabetha
KANSAS 66534

In Fertile Northeast Kansas

21 March, 1983

Gale Miller, President
Nemaha-Brown Watershed Board
Watershed District #7
Rt #4
Sabetha, Ks. 66534

Dear Mr. Miller,

This letter will serve as an endorsement to continue on with the project of Nemaha-Brown Watershed District #7 on the Delaware river. Sabetha is interested in a source of water supply for the City.

Very truly yours,

LaVon Wenger

LaVon Wenger
Mayor

January 23, 1983

TO WHOM IT MAY CONCERN:

We, the Board of Powhattan Township feel the urgency and need for the watershed projects as planned. We therefore intend to cooperate in any way possible with the Mickapoo Tribe, the Watershed District Board, and all other local governments involved.

Sincerely,

HENRY STUDER, JR.

Henry Studer, Jr (Rmd)

DOUGLAS SPELLMEIER

Douglas Spellmeier (Rmd)

RICHARD W. HEINIGER

Richard W Heiniger

FARMERS STATE BANK
BOX E
Sabetha, Kansas
66534

J. A. Mock
President

March 22, 1983

Mr. Gale Miller, President
Nemaha-Brown Watershed Board
Watershed District #7
Rte 4
Sabetha, Ks 66534

Dear Mr. Miller:

One of the most pressing problems facing Sabetha is the quantity and quality of its water supply.

The Delaware river project south of Sabetha will give us needed relief as far as our water supply is concerned and also give long-range help to the Kickapoo reservation in the Horton area.

Respectfully,

J. A. Mock
President

May 4, 1983

Superintendent, Horton Agency

Proposal for Funding to Develop a Watershed Plan.

Area Director, Anadarko Area Office
Attn: Allen C. Quetone, Trust Responsibilities

The Nemaha/Brown/Kickapoo Joint Watershed Board is requesting consideration for F.Y. 1983 planning funds from the BIA in conjunction with the development and implementation of a comprehensive watershed project. The attached proposal is in the amount of $100,000 and is for a consultant contract for development of the plan.

The Kickapoo Tribe, as a joint sponsor of this effort, is particularly interested in the development of their water resources with special emphasis on municipal, industrial and recreational benefits.

The proposal is written to satisfy the Soil Conservation Service requirements for a preauthorized planning document.

The Agency has and will continue to pledge support to the Kickapoo Tribe for their efforts and in order to provide leverage to the Tribe we request expeditious handling of the proposal and project.

If you have any questions, please contact Richard Beams, Agency Natural Resources Officer.

JMA/jak/5-4-1983

CONTRACTS

Watershed Protection and Flood Prevention Act, as amended*

AN ACT

To authorize the Secretary of Agriculture to cooperate with States and local agencies in the planning and carrying out of works of improvement for soil conservation, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States, causing loss of life and damage to property, constitute a menace to the national welfare; and that it is the sense of Congress that the Federal Government should cooperate with States and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purpose of preventing such damages, of furthering the conservation, development, utilization, and disposal of water, and the conservation and utilization of land and thereby of preserving, protecting, and improving the Nation's land and water resources and the quality of the environment.

SEC. 2. For the purposes of this Act, the following terms shall mean:

The "Secretary" --the Secretary of Agriculture of the United States.

"Works of improvement" --any undertaking for--

(1) flood prevention (including structural and land-treatment measures),

(2) the conservation, development, utilization, and disposal of water, or

(3) the conservation and proper utilization of land in watershed or subwatershed areas not exceeding two hundred and fifty thousand acres and not including any single structure which provides more than twelve thousand five hundred acre-feet of floodwater detention capacity, and more than twenty-five thousand acre-feet of total capacity. No appropriation shall be made for any plan involving an estimated Federal contribution to construction costs in excess of $5,000,000 or which includes any structure which provides more than twenty-five hundred acre-feet of total capacity unless such plan has been approved by resolutions adopted by the appropriate committees of the Senate and House of Representatives: Provided, That in the case of any plan involving no single structure providing more than 4,000 acre-feet of total capacity the appropriate committees shall be the Committee on Agriculture and Forestry of the Senate and the Committee on Agriculture of the House of Representatives and in the case of any plan involving any single structure of more than 4,000 acre-feet of total capacity the appropriate committees shall be the Committee on Public Works of the Senate and the Committee on Public Works of the House of Representatives, respectively. A number of such subwatersheds when they are component parts of a larger watershed may be planned together when the local sponsoring organizations so desire.

"Local organization" --any State, political subdivision thereof, soil or water conservation district, flood prevention or control district, or combinations thereof, or any other agency having authority under State law to carry out, maintain and operate the works of improvement; or any irrigation or reservoir company, water users' association, or similar organization having such authority and not being operated for profit that may be approved by the Secretary; or any Indian tribe or tribal organization, as defined in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b), having authority under Federal, State, or Indian tribal law to carry out, maintain, and operate the works of improvement.

SEC. 3. In order to assist local organizations in preparing and carrying out plans for works of improvement, the Secretary is authorized, upon application of local organizations if such application has been submitted to, and not disapproved within 45 days by, the State agency having supervisory responsibility over programs provided for in this Act, or by the Governor if there is no State agency having such responsibility--

(1) to conduct such investigations and surveys as may be necessary to prepare plans for works of improvement;

(2) to prepare plans and estimates required for adequate engineering evaluation;

(3) to make allocations of costs to the various purposes to show the basis of such allocations and to determine whether benefits exceed costs;

(4) to cooperate and enter into agreements with and to furnish financial and other assistance to local organizations: Provided, That, for the land-treatment measures, the Federal assistance shall not exceed the rate of assistance for similar practices under existing national programs;

(5) to obtain the cooperation and assistance of other Federal agencies in carrying out the purposes of this section;

(6) to enter into agreements with landowners, operators, and occupiers, individually or collectively, based on conservation plans of such landowners, operators, and occupiers which are developed in cooperation with and approved by the soil and water conservation district in which the land described in the agreement is situated, to be carried out on such land during a period of not to exceed ten years, providing for changes in cropping systems and land uses and for the installation of soil and water conservation practices and measures needed to conserve and develop the soil, water, woodland, wildlife, energy, and recreation resources of lands within the ares included in plans for works of improvement, as provided for in such plans, including watershed or subwatershed work plans in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat. 887), as amended and supplemented. Applications for assistance in developing such conservation plans shall be made in writing to the soil and water conservation district involved, and the proposed agreement shall be reviewed by such district. In return for such agreements by landowners, operators, and occupiers the Secretary shall agree to share the costs of carrying out those practices and measures set forth in the agreement for which he determines that cost sharing is appropriate and in the public interest. The portion of such costs, including labor, to be shared shall be that part

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*(P.L. 566, 83d Cong., 68 Stat. 666; P.L. 1018, 84th Cong., 70 Stat. 1088; P.L. 85-624, 85th Cong., 72 Stat. 563; P.L. 85-865, 85th Cong., 72 Stat. 1605; P.L. 86-468, 86th Cong., 74 Stat. 131, 132; P.L. 86-545, 86th Cong., 74 Stat. 254; P.L. 87-170, 87th Cong., 75 Stat. 408; P.L. 87-703, 87th Cong., 76 Stat. 608; P.L. 89-337, 89th Cong., 79 Stat. 1300; P.L. 90-361, 90th Cong., 82 Stat. 250; P.L. 92-419, 92d Cong., 86 Stat. 667; P.L. 95-113, 95th Cong., 91 Stat. 913; P.L. 97-98, 97th Cong., 95 Stat. 1213.)

which the Secretary determines is appropriate and in the public interest for the carrying out of the practices and measures set forth in the agreement, except that the Federal assistance shall not exceed the rate of assistance for similar practices and measures under existing national programs. The Secretary may terminate any agreement with a landowner, operator, or occupier by mutual agreement if the Secretary determines that such termination would be in the public interest, and may agree to such modifications of agreements, previously entered into hereunder, as he deems desirable to carry out the purposes of this paragraph or to facilitate the practical administration of the agreements provided for herein. Notwithstanding any other provision of law, the Secretary, to the extent he deems it desirable to carry out the purposes of this paragraph, may provide in any agreement hereunder for (1) preservation for a period not to exceed the period covered by the agreement and an equal period thereafter of the cropland, crop acreage, and allotment history applicable to land covered by the agreement for the purpose of any Federal program under which such history is used as a basis for an allotment or other limitation on the production of any crop; or (2) surrender of any such history and allotments.

SEC. 4. The Secretary shall require as a condition to providing Federal assistance for the installation of works of improvement that local organizations shall--

(1) acquire, or with respect to interests in land to be acquired by condemnation provide assurances satisfactory to the Secretary that they will acquire, without cost to the Federal Government from funds appropriated for the purposes of this Act, such land, easements, or rights-of-way as will be needed in connection with works of improvement installed with Federal assistance: Provided, That when a local organization agrees to operate and maintain any reservoir or other area included in a plan for public fish and wildlife or recreational development, the Secretary shall be authorized to bear not to exceed one-half of the costs of (a) the land, easements, or rights-of-way acquired or to be acquired by the local organization for such reservoir or other area, and (b) minimum basic facilities needed for public health and safety, access to, and use of such reservoir or other area for such purposes: Provided further, That the Secretary shall be authorized to participate in recreational development in any watershed project only to the extent that the need therefor is demonstrated in accordance with standards established by him, taking into account the anticipated man-days of use of the projected recreational development and giving consideration to the availability within the region of existing water-based outdoor recreational developments: Provided further, That the Secretary shall be authorized to participate in not more than one recreational development in a watershed project containing less than seventy-five thousand acres, or two such developments in a project containing between seventy-five thousand and one hundred and fifty thousand acres, or three such developments in projects exceeding one hundred and fifty thousand acres: Provided further, That when the Secretary and a local organization have agreed that the immediate acquisition by the local organization of land, easements, or rights-of-way is advisable for the preservation of sites for works of improvement included in a plan from encroachment by residential, commercial, industrial, or other development, the Secretary shall be authorized to advance to the local organization from funds appropriated for construction of works of improvement the amounts required for the acquisition of such land, easements or rights-of-way; and, except where such costs are to be borne by the Secretary, such advance shall be repaid by the local organization, with interest, prior to construction of the works of improvement, for credit to such construction funds: Provided further, That the Secretary shall be authorized to bear an amount not to exceed one-half of the costs of the land, easements, or rights-of-way acquired or to be acquired by the local organization for mitigation of fish and wildlife habitat losses, and that such acquisition is not limited to the confines of the watershed project boundaries;

(2) assume (A) such proportionate share, as is determined by the Secretary to be equitable in consideration of national needs and assistance authorized for similar purposes under other Federal programs, of the costs of installing any works of improvement, involving Federal assistance (excluding engineering costs), which is applicable to the agricultural phases of the conservation, development, utilization, and disposal of water or for fish and wildlife development, recreational development, ground water recharge, water quality management, or the conservation and proper utilization of land: Provided, That works of improvement for water quality management shall consist primarily of water storage capacity in reservoirs for regulation of streamflow, except that any such storage and water releases shall not be provided as a substitute for adequate treatment or other methods of controlling waste at the source, and shall be consistent with standards and regulations adopted by the Water Resources Council on Federal cost sharing for water quality management, and (B) all of the cost of installing any portion of such works applicable to other purposes except that any part of the construction cost (including engineering costs) applicable to flood prevention and features relating thereto shall be borne by the Federal Government and paid for by the Secretary out of funds appropriated for the purposes of this Act: Provided, That, in addition to and without limitation on the authority of the Secretary to make loans or advancements under section 8, the Secretary may pay for any storage of water for present or anticipated future demands or needs for municipal or industrial water included in any reservoir structure constructed or modified under the provisions of this Act as hereinafter provided: Provided further, That the cost of water storage to meet future demands may not exceed 30 per centum of the total estimated cost of such reservoir structure and the local organization shall give reasonable assurances, and there is evidence, that such demands for the use of such storage will be made within a period of time which will permit repayment within the life of the reservoir structure of the cost of such storage: Provided further, That the Secretary shall determine prior to initiation of construction or modification of any reservoir structure including such water supply storage that there are adequate assurances by the local organization or by an agency of the State having authority to give such assurances, that the Secretary will be reimbursed the cost of water supply storage for anticipated future demands, and that the local organization will pay not less than 50 per centum of the cost of storage for present water supply demands: And provided further, That the cost to be borne by the local organization for anticipated future demands may be repaid within the life of the reservoir structure but in no event to exceed fifty years after the reservoir structure is first used for the storage of water for anticipated future water supply demands, except that (1) no reimbursement of the cost of such water supply storage for anticipated future demands need be made until such supply is first used, and (2) no interest shall be charged on the cost of such water supply storage for anticipated future demands until such supply is first used but in no case shall the interest-free period exceed ten years. The interest rate used for purposes of computing the interest on the unpaid balance shall be determined in accordance with the provisions of section 8.

(3) make arrangements satisfactory to the Secretary for defraying costs of operating and maintaining such works of improvement, in accordance with regulations presented by the Secretary of Agriculture.

(4) acquire, or provide assurance that landowners or water users have acquired, such water rights, pursuant to State law, as may be needed in the installation and operation of the work of improvement.

(5) obtain agreements to carry out recommended soil conservation measures and proper farm plans from owners of not less than 50 per centum of the lands situated in the drainage area above each retention reservoir to be installed with Federal assistance; and

(6) submit a plan of repayment satisfactory to the Secretary for any loan or advancement made under the provisions of section 8.

SEC. 5. (1) At such time as the Secretary and the interested local organization have agreed on a plan for works of improvement, and the Secretary has determined that the benefits exceed the costs, and the local organization has met the requirements for participation in carrying out the works of improvement as set forth in section 4, the local organization may secure engineering and other services, including the design, preparation of contracts and specifications, awarding of contracts, and supervision of construction, in connection with such works of improvement, by retaining or employing a professional engineer or engineers satisfactory to the Secretary or may request the Secretary to provide such services: Provided, That if the local organization elects to employ a professional engineer or engineers, the Secretary shall reimburse the local organization for the costs of such engineering and other services secured by the local organization as are properly chargeable to such works of improvement in an amount not to exceed the amount agreed upon in the plan for works of improvement or any modification thereof: Provided further, That the Secretary may advance such amounts as may be necessary to pay for such services, but such advances with respect to any works of improvement shall not exceed 5 per centum of the estimated installation cost of such works.

(2) Except as to the installation of works of improvement on Federal lands, the Secretary shall not construct or enter into any contract for the construction of any structure: Provided, That if requested to do so by the local organization, the Secretary may enter into contracts for the construction of structures.

(3) Whenever the estimated Federal contribution to the construction cost of works of improvement in the plan for any watershed or subwatershed area shall exceed $5,000,000 or the works of improvement include any structure having a total capacity in excess of twenty-five hundred acre-feet, the Secretary shall transmit a copy of the plan and the justification therefor to the Congress through the President.

(4) Any plan for works of improvement involving an estimated Federal contribution to construction costs in excess of $5,000,000 or including any structure having a total capacity in excess of twenty-five hundred acre-feet (a) which includes works of improvement for reclamation or irrigation, or which affects public or other lands or wildlife under the jurisdiction of the Secretary of the Interior, (b) which includes Federal assistance for floodwater detention structures, (c) which includes features which may affect the public health, or (d) which includes measures for control or abatement of water pollution, shall be submitted to the Secretary of the Interior, the Secretary of the Army, the Secretary of Health, Education, and Welfare, or the Administrator of the Environmental Protection Agency, respectively, for his views and recommendations at least thirty days prior to transmission of the plan to the Congress through the President. The views and recommendations of the Secretary of the Interior, the Secretary of the Army, the Secretary of Health, Education, and Welfare, and the Administrator of the Environmental Protection Agency, if received by the Secretary prior to the expiration of the above thirty-day period, shall accompany the plan transmitted by the Secretary to the Congress through the President.

(5) Prior to any Federal participation in the works of improvement under this Act, the President shall issue such rules and regulations as he deems necessary or desirable to carry out the purposes of this Act, and to assure the coordination of the work authorized under this Act and related work of other agencies, including the Department of the Interior and the Department of the Army.

SEC. 6. The Secretary is authorized in cooperation with other Federal and with States and local agencies to make investigations and surveys of the watersheds of rivers and other waterways as a basis for the development of coordinated programs. In areas where the programs of the Secretary of Agriculture may affect public or other lands under the jurisdiction of the Secretary of the Interior, the Secretary of the Interior is authorized to cooperate with the Secretary of Agriculture in the planning and development of works or programs for such lands.

SEC. 7. The provisions of the Act of June 22, 1936 (49 Stat. 1570), as amended and supplemented, conferring authority upon the Department of Agriculture under the direction of the Secretary of Agriculture to make preliminary examinations and surveys and to prosecute works of improvement for runoff and waterflow retardation and soil erosion prevention on the watersheds of rivers and other waterways are hereby repealed: Provided, That (a) the authority of that Department of Agriculture, under the direction of the Secretary, to prosecute the works of improvement for runoff and waterflow retardation and soil erosion prevention authorized to be carried out by the Department by the Act of December 22, 1944 (58 Stat. 887), as amended, and (b) the authority of the Secretary of Agriculture to undertake emergency measures for runoff retardation and soil erosion prevention authorized to be carried out by section 7 of the Act of June 28, 1938 (52 Stat. 1215), as amended by Section 216 of the Act of May 17, 1950 (64 Stat. 163), shall not be affected by the provisions of this section: Provided further, That in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat. 887), as amended and supplemented, the Secretary of Agriculture is authorized to prosecute additional works of improvement for the conservation, development, utilization, and disposal of water in accordance with the provisions of section 4 of this Act or any amendments hereafter made thereto.

SEC. 8. The Secretary is authorized to make loans or advancements (a) to local organizations to finance the local share of costs of carrying out works of improvement provided for in this Act, and (b) to State and local agencies to finance the local share of costs of carrying out works of improvement (as defined in section 2 of this Act) in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat. 887), as amended and supplemented: Provided, That the works of improvement in connection with said eleven watershed improvement programs shall be integral parts of watershed or subwatershed work plans agreed upon by the Secretary of Agriculture and the concerned State and local agencies. Such loans or advancements shall be made under

contracts or agreements which will provide, under such terms and conditions as the Secretary deems appropriate, for the repayment thereof in not more than fifty years from the date when the principal benefits of the works of improvement first become available, with interest at the average rate, as determined by the Secretary of the Treasury, payable by the Treasury upon its marketable public obligations outstanding at the beginning of the fiscal year in which the loan or advancement is made, which are neither due nor callable for redemption for fifteen years from date of issue. With respect to any single plan for works of improvement, the amount of any such loan or advancement shall not exceed $10,000,000.

SEC. 9. The provisions of this Act shall be applicable to Hawaii, Alaska, Puerto Rico, and the Virgin Islands.

SEC. 10. There are hereby authorized to be appropriated such sums as may be necessary to carry out the purposes of this Act, such sums to remain available until expended. No appropriation hereafter available for assisting local organizations in preparing and carrying out plans for works of improvement under the provisions of section 3 or clause (a) of section 8 of this Act shall be available for any works of improvement pursuant to this Act or otherwise in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat. 887), as amended and supplemented, or for making loans or advancements to State and local agencies as authorized by clause (b) of section 8.

SEC. 11. This Act may be cited as the "Watershed Protection and Flood Prevention Act".

SEC. 12. When the Secretary approves the furnishing of assistance to a local organization in preparing a plan for works of improvement as provided for in section 3:

(1) The Secretary shall so notify the Secretary of the Interior in order that the latter, as he desires, may make surveys and investigations and prepare a report with recommendations concerning the conservation and development of wildlife resources and participate, under arrangements satisfactory to the Secretary of Agriculture, in the preparation of a plan for works of improvement that is acceptable to the local organization and the Secretary of Agriculture.

(2) Full consideration shall be given to the recommendations contained in any such report of the Secretary of the Interior as he may submit to the Secretary of Agriculture prior to the time the local organization and the Secretary of Agriculture have agreed on a plan for works of improvement. The plan shall include such of the technically and economically feasible works of improvement for wildlife purposes recommended in the report by the Secretary of the Interior as are acceptable to, and agreed to by, the local organization and the Secretary of Agriculture, and such report of the Secretary of the Interior shall, if requested by the Secretary of the Interior, accompany the plan for works of improvement when it is submitted to the Secretary of Agriculture for approval or transmitted to the Congress through the President.

(3) The cost of making surveys and investigations and of preparing reports concerning the conservation and development of wildlife resources shall be borne by the Secretary of the Interior out of funds appropriated to his Department.

As amended December 22, 1981.

COPY

CERTIFICATE OF RESOLUTION

I Craig Mitts hereby certify that the following resolution was adopted at a Special meeting of the Board of Directors of the Nemaha-Brown Watershed Joint District No. 7 of Kansas held on Feb. 17, 1983 at 7:30 P.M. at 117 So. 6th Hiawatha, Kansas.

"Be It Resolved By the Board of Directors of Nemaha-Brown Watershed Joint District No. 7 of Kansas that said Board of Directors are interested in cooperating with and jointly sponsoring with the Kickapoo Tribe of Kansas at Brown County, Horton, Kansas said Watershed Development and Construction provided a written agreement can be worked out satisfactory to both parties as to how the joint sponsorship would be administered and how funds would be spent and the selction of priorty of sites within said watershed District, to mention a few decisions to be made. Said Board is very interested in cooperating with said tribe to see if this Joint Sponsorship can be worked out both administratively and by funding through Public Federal funds.

I have compared the above resolution to those in minutes of said watershed and find it to be true and correct.

Secretary

Subscribed and sworn to this 17th day of February, 1983.

Notary Public

My appointment expires:

DON A. CASHMAN
NOTARY PUBLIC
State of Kansas
My Appt. Exp. 2-25-85

CO-SPONSORSHIP AGREEMENT ON PL566 STRUCTURES

THIS AGREEMENT made this 28 day of March, 1983, by and between the Nemaha-Brown Watershed Joint District #7, organized and incorporated under the provisions of the Kansas Watershed District Act pursuant to Article 12 of Chapter 24 of the Kansas Statutes Annotated (hereinafter referred to as "District"), and the Kickapoo Tribe of Kansas, a federally recognized tribe as defined by the Indian Reorganization Act of June 18, 1934, (hereinafter referred to as "Tribe").

WHEREAS, the tribal lands and reservation of the Tribe are in the Nemaha-Brown Watershed Joint District #7, and

WHEREAS, the tribal land and natural resources is a trust responsibility of the Federal Government, and

WHEREAS, the District and the Tribe are jointly concerned about the serious problems of water management resulting from erosion, floodwater and sediment damages and the instability of natural water supplies in Northeast Kansas;

WHEREAS, the District and the Tribe are jointly interested in alleviating such damages and furthering the conservation, development, utilization and disposal of water and thereby preserving and protecting the State's and Tribe's land and water resources;

WHEREAS, Public Law 566, 83rd Congress 68 Stat. 666 as amended authorizes the Secretary of Agriculture to cooperate with the State and local agencies in the planning and carrying out of works and improvements for soil conservation and other purposes;

WHEREAS, Public Law 566, 83rd Congress 68 Stat. 666 was amended December 22, 1981 to define local agencies to include soil or water conservation and any Indian tribe or combination of agencies;

WHEREAS, the District and the Tribe, both being qualified local agencies under Public Law 566 are desirous of obtaining planning and improvements under Public Law 566.

NOW, THEREFORE, BE IT RESOLVED that USDA (SCS) and the Department of Interior (BIA) provide priority assistance and the support for this unprecedented initial joint tribal and watershed district project.

NOW, THEREFORE, IT IS AGREED that the District and the Tribe shall be co-sponsors of a Public Law 566 plan and the ensuing improvements for those 566 structures. Sponsorship shall be accomplished by formation of a joint watershed board.

A. JOINT WATERSHED BOARD RESPONSIBILITIES

1. The joint board shall consist of six (6) members with the board electing its own officers consisting of a president, vice-president and secretary. The terms of board officers to be one (1) year running from April 1 to March 31 of each year. The term of the members on the board is to be established by the sponsoring local agency, i.e. the tribe and the watershed district.

2. The joint board shall adopt rules and regulations for conducting its meeting and for governing its procedures which rules and regulations must be approved by the tribe and watershed district before said rules and regulations become effective.

3. The board shall sponsor planning and construction of all PL566 structures within the Nemaha-Brown Watershed District #7. Additional sponsors may be added for individual structures.

4. The board will turn completed structures over to the local agencies for maintenance, i.e. those structures located on the reservation shall be turned over to the tribe and those structures located off the reservation shall be turned over to the watershed district or maintenance responsibilities.

5. The board will work together to assure a stable water supply for all people.

6. At such time that all PL 566 planning and construction of said structures is completed, the work of the joint board will be completed and it will be disbanded.

7. The joint watershed board will receive no local tax money.

8. All monies received for the Joint Board projects to be put in an escrow account. Payments to be made upon approval of Joint Board and Agency supplying funds.

B. DISTRICT RESPONSIBILITIES

The District shall:

1. Provide three members to the joint watershed board, and pay their fees and expenses.

2. Continue to operate under its General Plan dated May, 1978.

3. Continue to monitor, design, construct all structures in the watershed except PL566 structures. This work to be done with local tax money and any state monies that it may receive.

4. Be responsible for all funds which are turned over to it or granted to it by federal or state agencies and shall be responsible for the disbursement of those funds and accountable to the governmental agency which provides those funds to it and the joint watershed board and the Tribe shall not be responsible for those funds received directly by the watershed district board for use on structures within the watershed.

5. To amend its General Plan as required to reflect the PL566 planning.

6. Maintain all PL566 structures in the watershed outside the reservation.

7. Control use of all structures in the watershed outside of the reservation.

C. TRIBE RESPONSIBILITIES

The Tribe shall:

1. Provide three members to the joint watershed board, and pay their fees and expenses.

2. Maintain all structures built on the reservation.

3. May assist the district and joint watershed board by the construction of structures under other programs (FmHA, HUD, etc.)

4. Control use of structures on the reservation.

5. Be responsible for all funds which are turned over to it or granted to it by federal agencies and shall be responsible for the disbursement of those funds and accountable to the governmental agency which provides those funds to it and the joint watershed board and the District shall not be responsible for those funds received directly by the Tribe for use on structures within the watershed.

6. As to the maintenance of all dams off of the reservation which affect PL566 structures on the reservation, when the same are not maintained by the landowner and the District must take over the maintenance of the same, then for those structures, the cost of the maintenance will be shared by the Tribe and the District in a ratio to be agreed upon by said Tribe and District for that maintenance prior to the construction. The parties hereto understand that the structures above and off of the reservation which may affect the PL566 dams on the reservation will have a different ratio of benefit to those dams on the reservation and therefore the actual cost ratio of maintenance will have to be determined at the time of construction and an agreement must be signed for co-maintenance before the structure is actually built.

7. As to any other structures built on the reservation, they shall be maintained by the Tribe if not maintained by the landowner.

D. OTHER MUTUAL UNDERSTANDINGS

1. It is the understanding of the District and the Tribe that the goal of the two local agencies is the ultimate construction of all needed structures within the watershed. It is further understood that the division of responsibility between the Joint board, District and the Tribe is done in the best interest of obtaining this goal and benefiting the people of Northeast Kansas.

2. The parties hereto realize that this agreement may have to be amended or changed as this joint sponsorship proceeds through the various stages, and therefore, the

parties agree that this agreement may be amended upon mutual consent of both parties hereto and all changes, amendments or additions will be reduced to writing and signed by all parties hereto in the same manner as this document was executed.

IN WITNESS WHEREOF, the parties have executed this agreement this 28 day of March, 1983.

NEMAHA-BROWN WATERSHED JOINT DISTRICT 7

By: Gale E. Miller
Gale Miller - President

ATTEST:

W. Craig Mitts
W. Craig Mitts - Secretary

KICKAPOO TRIBE OF KANSAS

By: John Thomas
John Thomas - Tribal Chairman

ATTEST:

Tom Cadue
Tom Cadue - Secretary

Contract

This Contract, made and entered into this 27th day of December, 1983, by and between the NEMAHA/BROWN/KICKAPOO JOINT WATERSHED BOARD, Horton, Kansas hereinafter referred to as Party of the First Part or Board, and VAN DOREN-HAZARD-STALLINGS, ENGINEERS-ARCHITECTS-PLANNERS, Shawnee County, Kansas, hereinafter referred to as Party of the Second Part or Engineers.

WHEREAS, the Party of the First Part is desirous of employing the Party of the Second Part as consultants to assist in preparing the necessary planning documents to allow the Board to receive funds for construction as outlined in Public Law 83-566. Additional assistance in preparation of the plan will come from the Soil Conservation Service.

WHEREAS, the Party of the Second Part is desirous of providing said services to the Party of the First Part.

NOW, THEREFORE, IT IS AGREED as follows: That the Party of the First Part does hereby employ the Party of the Second Part for the purpose of performing the following services.

A. ENGINEERING SERVICES

1. The general scope of engineering services shall be as outlined in Attachment A. This work comprises the steps necessary to complete the Public Law 83-566 planning process.

2. In completion of the planning process it will be necessary to have portions of the work completed by the Soil Conservation Service staff. Attachment B outlines the workloads anticipated for both the Engineer and the Soil Conservation Service. All direct expenses have been converted to mandays in Attachment B.

B. BOARD'S RESPONSIBILITIES

1. Phase Development. It is understood that money cannot be made available to complete the total planning process at one time. It will therefore be necessary for the Board to establish Phasing as money becomes available.

2. Payments to the Engineer. The Board agrees to pay the Engineer for services performed as follows:
   a. For engineering services, the fee shall be computed as the sum of: The amount of the payroll incidental to such services including salary and allowance for holidays, sick leave, vacations, social security, insurance, unemployment, excise and payroll taxes plus one hundred (100) percent for overhead, general administration and profit; and
   b. Other direct out-of-pocket expenses incidental to the rendering of this service.

3. Payment Schedule. Engineer shall make monthly pay requests to the Board for services completed to date. Upon approval of the Board, payment shall be made to the Engineer.

C. OTHER MUTUAL UNDERSTANDINGS

1. Insurance. The Engineer shall maintain such insurance as will protect him from claims under Workmen's Compensation Acts, public liability and property damage. The Engineer will also maintain valuable papers insurance to assure the restoration of any plans, drawings, field notes or other similar data relating to the work covered by this Agreement, in the event of their loss or destruction, until such time as the work has been delivered to the Board.

2. Arbitration. Questions in dispute under the contract shall be submitted to arbitration in accordance with Chapter 5, Article 2, Kansas Statutes Annotated and Amendments thereto.

3. Authorization. It is agreed the Engineer shall not commence work on any phase until the Engineer and the Board have a signed addendum to this contract outlining the general scope and fee for that phase of work.

4. Successors and Assigns. The Board and the Engineer each binds himself, his partners, successors, executors, administrators and assigns to the other party of this Agreement and to the partners, successors, executors, administrators and assigns of such other party in respect to all covenants of this Agreement. Neither the Board nor the Engineer shall assign, sublet or transfer his interest in this Agreement without the written consent of the other.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on this 28 day of April 1983.

NEMAHA/BROWN/KICKAPOO JOINT WATERSHED BOARD

By _____
Chairman

By _____
Secretary

VAN DOREN-HAZARD-STALLINGS
ENGINEERS-ARCHITECTS-PLANNERS

By _____
Partner

NBJWD03487

WORK OUTLINE

The following discussion defines those items, describes study detail, identifies special responsibilities, and notes special expertise needed.

Watershed planning is a reiterative process. The process is divided in two phases separated by a planning authorization. The two phases are preauthorization planning and plan development.

Studies during the preauthorization planning phase will be carried to the extent and detail necessary to determine if a viable, environmentally acceptable watershed plan can be developed that sponsors are willing and able to carry out. Studies will include: detailed identification and quantification of water and related land resource problems and needs; identification of alternative solutions; preliminary assessment of resulting impacts; and acquisition of a portion of the land rights by sponsors.

131 [1/] - Sponsor and Public Input

Includes mailing questionnaire to interested agencies, groups, and individuals to determine their desire to participate in the planning process. Also includes interagency, interdisciplinary team (IDT) meetings, and a public meeting to identify problems and needs and solicit ideas about alternatives to be studied.

132, 241, 242 - Resource Assessment

Includes detailed studies of economic and environmental factors needed to quantify problems and needs and to form the basis for measuring impacts of alternatives. Assessments are to be made for present and projected future without project conditions.

Includes flood plain surveys (with 2,500 foot average spacing of valley cross sections), hydraulics computations (by WSPII), computation of area inundated, damage interviews (50 percent of flood plain farmers), TR-20, ECON II, and other basic data and computations needed to evaluate flood damages.

Includes assessment of land use and treatment, wildlife habitat, critical habitat for threatened and endangered species, archaeological and historical values, watershed characteristics related to water quality, and erosion and sedimentation.

[1/] Work item numbers refer to first generation of Kansas Workload Analysis ADP Program.

The land use and treatment assessment will include maps and tabulations necessary to determine the current status and future needs of land treatment (by practice and acres adequately protected) by land use (cropland, pastureland, rangeland, upland woodland, riparian woodland, odd areas, and miscellaneous) for each subarea of the watershed. Each subarea tabulation of land use and treatment will be further broken down for the drainage area of each grade stabilization problem area (affected areas with associated land treatment status and needs).

The Universal Soil Loss Equation will be used to compute upland erosion rates and appropriate delivery ratios will be applied to compute sediment rates.

Includes inventory of water supply needs, recreation needs, and groundwater quality and quantity.

Includes determination of reservoir site potential through map studies, preliminary geologic studies, preliminary cost analysis, preliminary water yield studies, and water quality studies.

Special expertise will include Kansas State and Extension Forestry Department (KSEF), Kansas Fish and Game Commission (KFGC), U.S. Fish and Wildlife Service (FWS), Kansas State Historical Society (KSHS), Kansas Geological Survey (KGS), Kansas Water Resources Board (KWRB), Kansas Department of Health and Environment (KDHE), Environmental Protection Agency (EPA), Bureau of Indian Affairs (BIA) and consultants.

133 - Initial Specification of Components

Includes IDT and sponsor input needed to firm up the list of component objectives. All components should be quantified at this point. Begin consideration of alternatives to solve identified problems and needs.

151 - Identify Alternatives

Includes identification of alternatives to be studied in detail during the plan development phase. Most of the basic elements (especially possible structure sites) must be identified before setting up TR-20 (Resource Assessment work item). All reasonable alternatives proposed by the IDT, sponsors, and public are to be considered. Includes identification of tentative environmental quality (EQ) plan elements by the IDT. Includes formulation of base National Economic Development (NED) plan by sponsors, assisted by SCS.

161 - Assess Economic Impacts

Includes evaluation of benefits and costs by approximate methods (detail dependent upon viability of the alternative). Costs are to be based upon experience backed by data derived from USGS quad sheets and survey and geologic investigation of NED reservoir sites by methods described in work item 261. Flood damage reduction benefits are to be based on enough TR-20 and ECON II runs (with benefit distributions) to evaluate the range of potential benefits covering the maximum net benefit alternative.

Grade stabilization benefits are to be computed as the increased income due to the associated land treatment that landowners are expected to install in the affected (or interdependent) areas. The most probable future conditions (without and with project) are to be estimated by an IDT including the district conservationist. Associated land treatment costs are to be included as part of the grade stabilization cost in benefit:cost analysis.

Recreation benefits and costs are to be computed based upon a preliminary recreation layout sized to meet needs.

Water supply benefits are to be based on an estimate of the least alternative cost to satisfy needs. The separable cost-remaining benefit method will be used for cost alloction.

162 - Assess Environmental Impacts

Includes identification of probable impacts and relative degree of importance by IDT (probably using some system like network analysis). Method and degree of detail for impact analysis are to be determined. Approximate methods are to be used for any quantification at this point.

Special expertise includes KFGC, FWS, BIA, and KSHS.

171 - Preauthorization Report 2/

Includes preparation of a preauthorization report with drafts for review by sponsors, SCS (TSC, SO, AO, and FO), and federal, state, and local agencies, and interested groups. This report summarizes results of planning studies to date.

171a - Sponsor and Public Input

Includes review of the preauthorization report at a public meeting. Also includes review and comment on the report distributed in the previous work item. Interested parties will have an opportunity to comment on alternatives and offer additional alternatives for study.

2/ Final report only if a plan appropriate to PL-566 cannot be developed.

Includes acquisition of land rights by sponsors for at least one fourth of the NED sites surveyed in work item 161. Land rights work maps will be provided by SCS for the NED sites surveyed.

172 - Decision to Proceed or Not

Sponsors and SCS decide to proceed with plan development or not. A no-project report will be prepared and furnished to sponsors by the State Conservationist if the decision is negative. This report will summarize results to date and recommend alternatives to PL-566 action.

174 - Update Plan of Work

If the decision is to proceed, the plan of work will be updated so that all involved will be aware of the work remaining and the target dates for accomplishing the various steps. The updated plan of work will describe the minimum amount and kind of supporting data needed for TSC and WRC independent review.

The only alternatives to be refined past the preauthorization phase are those for which institutional arrangements exist or can be developed and for which there is a body of support. Refinement of the NED alternative for purposes of cost allocation is an exception.

175 - TSC Concurrence

Includes review and concurrence of the updated plan of work by the Technical Service Center.

176 - Planning Authorization Request

Planning authorization is requested from the SCS Administrator by the State Conservationist. The Notice of Intent to file an EIS is prepared and distributed.

Plan development is primarily the phase of planning dealing with plan selection and refinement of the selected plan for purposes of authorization. Further details on alternatives will be developed as needed to make tradeoffs and to arrive at the selected plan. This phase also includes development of the draft and the final plan and environment impact statement.

233 - Firm Specification of Components

Includes review and refinement of components of objectives, taking into account reaction to the preauthorization report. All problems, needs, and objectives should be identified and quantified at this point.

251 - Firm NED Alternative

Includes incremental analysis necessary to define maximum net benefit plan, using base NED alternative (formulated by sponsors in Identify Alternatives step). Costs are to be based upon detailed surveys included in the Economic Impact and Environmental Impact work items. Includes studies necessary to insure that all constraints are met.

252 - Firm EQ Alternative

Includes refinement of EQ plan elements with additional IDT meeting(s) as necessary. Includes biologic, engineering, geologic, etc., studies necessary to determine that all elements are physically feasible and that institutional arrangements exist which could conceivably install each element.

Special expertise includes the KFGC and BIA.

253 - Firm Other Alternatives

Includes analysis of other alternatives to determine that they are physically feasible and fit within the range between the NED and EQ alternatives.

261 - Economic Impacts

Includes reservoir surveys (photogrammetric method with 4 foot contour interval and photographic background; field surveyed center line profile) of feasible (NED and EQ) sites not surveyed in work item 161. Also includes geologic investigations, preliminary designs, and cost estimates as needed to firm up alternatives and provide sound information for plan selection. Geologic investigations will include on site observations of all sites and core drilling of any multipurpose site and those single-purpose sites having questionable rock excavation. Soil mechanics testing and analysis will be done on any multipurpose site and on those single-purpose sites exhibiting foundation conditions requiring flatter slopes than normal. Includes analysis (in addition to that of the three preceding work items) necessary to document economic impacts in the plan and supporting data. Includes preparation of preliminary land rights maps.

Includes studies of municipal-industrial water supply storage necessary to determine that any water supply reservoir will hold water and that the supply will be adequate in quantity and quality.

262 - Environmental Impacts

Includes firming up identification and quantification of significant impacts. Field surveys, IDT meetings, sponsor meetings, etc., are included as necessary to formulate compensation measures. Includes analysis of the impact of alternatives on such items as land use, erosion and sedimentation, water quality, archeological and historical values, etc., using the conditions established in the Resource Assessment work item as a base. Includes Phase II and III archeological studies (refer to SCS-KSHS cooperative agreement).

Special expertise includes KFGC, FWS, KSEF, KDHE, EPA, BIA, and consultants.

263 - Tradeoffs

Includes analysis necessary to display tradeoffs dependent upon selection of the various alternatives. This step completes information needed by sponsors for final plan selection.

264 - Plan Selection

Includes counsel with sponsors to convey information and recommendations necessary for final plan selection. Includes reiteration of preceding steps as necessary. Includes finalizing details regarding multipurpose developments (if any), including cost-sharing arrangements, operation and maintenance (O&M) responsibilities, land rights acquisition, etc.

271 - Working Draft Plan/EIS

Includes preparation of rough draft with blanks to be filled in by the water resources planning staff and other concerned SCS staff. Includes review by planning staff and others directly involved in plan development.

Includes development of going program and accelerated land tretment data, costs, and discussion for the plan using basic information compiled in the Resource Assessment work item.

Also includes completing and furnishing land rights work maps to sponsors.

Special expertise includes a technical writer provided by the State Conservation Commission (SCC) for this draft and subsequent rewrites.

272 - State Staff Draft Plan/EIS

Includes rewrite of working draft and preparation, transmittal, and review of a draft by the SCS state staff, area staff, and field office staff. Also includes review by sponsors and participating agencies.

273 - Local Review and TSC Review Draft Plan/EIS

Includes rewrite following previous review. The end product should be the best job the sponsors and SCS at the state level can do. This draft is transmitted to the SCS Technical Service Center with followup and rewrite as necessary to obtain TSC concurrence. Copies of this draft are also transmitted to the Washington office. Includes typing, printing, assembly; and transmittal to sponsors, to local offices of federal agencies, to state and local agencies, and to interested local groups and individuals.

274, 276 - Interagency Review Draft Plan/EIS

Includes transmittal to federal agencies at departmental level, to the Governor, and to concerned organizations.

Reproduction and assembly of this draft and the final plan/EIS and preparation of necessary maps.

275 - Public Meeting

A public meeting will be held to review the plan/EIS and comments received through the local and interagency review and to solicit public opinion.

278 - Final Plan/EIS

Includes revision as necessary following review of the draft. Also includes preparation of the Consultation section of the EIS and steps necessary to obtain the final EPA rating and TSC concurrence.

Includes distribution of the final plan/ES and Notice of Availability following signature by sponsors. Includes State Conservationist's signature following 30 days after Notice of Availability is published in the Federal Register and the Administrator's concurrence. This action and transmittal of manually signed copies will mark completion of planning.

279 - Followup Through Authorization

Includes testimony, supporting data, correspondence, meetings, telephone calls, etc. as required by sponsors, congressmen, and others to provide interpretations and supporting information necessary to move the plan through the authorization process. Includes preparation of addendums, as necessitated by interest rate changes.

Nemaha/Brown/Kickapoo Watershed
Preauthorization Planning
Time Breakdown (Man Days)

Planning Steps		VHS	SCS
Ø15	Develop Plan of Work	3	6
131	Sponsor & Public Input	3	8
132) 241) 242)	Resource Assessment	1116	241
133	Initial Spec. of Components	3	5
151	Identify Alternatives	18	34
161	Assess Economic Alternatives	188	53
162	Assess Economic Impacts	41	14
171	Preauthorization Report	12	12
171A	Sponsor & Public Input	3	6
172	Decision to Proceed	2	4
174	Update Plan of Work	2	6
175	TSC Concurrence	2	2
176	Planning Authorization	3	3
	Total	1396	394

Nemaha/Brown/Kickapoo Watershed
Plan Development
Time Breakdown (Man Days)

	Planning Steps	VHS	SCS
233	Firm Spec. of Components	1	3
251	Firm Up NED Alternatives	361	5Ø
252	Firm Up EQ Alternatives	35	11
253	Firm Up Other Alternatives	18	9
261	Economic Impacts	1475	66
262	Environmental Impacts	55	15
263	Trade Offs	19	2
264	Plan Selection	8	13
271	Working Draft Plan/EIS	91	29
272	State Staff Draft Plan/EIS	47	2Ø
273	TSC Review Draft Plan/EIS	42	17
274) 276)	Local and Indian Agency Draft	26	9
275	Public Meeting	2	8
278	Final Plan/EIS	22	5
279	Follow Up Through Authorization	1Ø	12
	Total	2212	269

Addendum Number 1 to Contract

1. The Contract dated the 28th day of April 1983 by and between:

   A. NEMAHA/BROWN/KICKAPOO JOINT WATERSHED BOARD, Horton, Kansas (hereinafter referred to as "Board")

   B. VAN DOREN-HAZARD-STALLINGS, Engineers-Architects-Planners (hereinafter referred to as "Engineer")

2. The Contract dated the 28th day of April 1983 shall be amended as follows:

   A. The Engineer shall undertake Phase 1 of the engineering services. Phase 1 shall consist of the first portions of the Soil Conservation Service's Standard Preauthorization-Planning including all of task 015 - Develop Plan of Work, all of task 131 - Sponsor & Public Input, and portions of 132, 241, 242 - Resource Assessment. This work shall be completed within seven (7) months of notice to proceed provided weather and crop conditions allow timely execution of field work. Attachment 1A outlines the tasks in detail.

   B. The fee for this work shall be cost plus as outlined in paragraph B of the base Contract. The total fee for Phase 1 shall not exceed $95,000.

3. All other items and conditions of said Contract shall be the same.

4. Signing and dating of this addendum will constitute notice to proceed with the outlined work.

IN WITNESS THEREOF, the parties hereto have executed this Addendum to Contract on this _____ day of _____, 1983.

NEMAHA/BROWN/KICKAPOO JOINT WATERSHED BOARD

By _____
Chairman

By _____
Secretary

VAN DOREN-HAZARD-STALLINGS
ENGINEERS-ARCHITECTS-PLANNERS

By _____
Partner

Outline of Tasks

Task 015 - Develop Plan of Work

Formulate the steps necessary to complete the detailed Preauthorization Planning. Develop plan for gathering available data required for the planning process.

Task 131 - Sponsor and Public Input

Assist Soil Conservation Service in the development of a public participation process. This includes the assistance in the development of questionnaires and mailing lists as well as individual contacts.

Task 132, 241, 242 - Resource Assessment

1. Develop aerial photography of the entire watershed at an elevation of 4800 ft. with suitable overlap for mapping. Furnish aerial negatives, contact prints, and index map of photograph location.

2. Produce work maps of the entire basin using the aerial photography.

3. Develop bench marks near each potential site and bench marks needed for valley sections (minimum of 120 bench marks). Each bench mark is to be referenced to some identification landmark. Produce bound report containing bench mark information including maps and descriptions.

4. Preliminary Hydrology: Using base maps and USGS quad maps develop drainage areas and subareas. Planimeter all areas and put in report form. Locate all watershed reaches. Develop channel stationing and flood flow centerline and stationing.

5. Geology (Sedimentation):
   a. Assemble and review existing data.
   b. Complete reconnaissance investigation for formulation of work outline for geology.
   c. Prepare geologic map of watershed.
   d. Select valley sections.
   e. Develop soil-cover complex data.

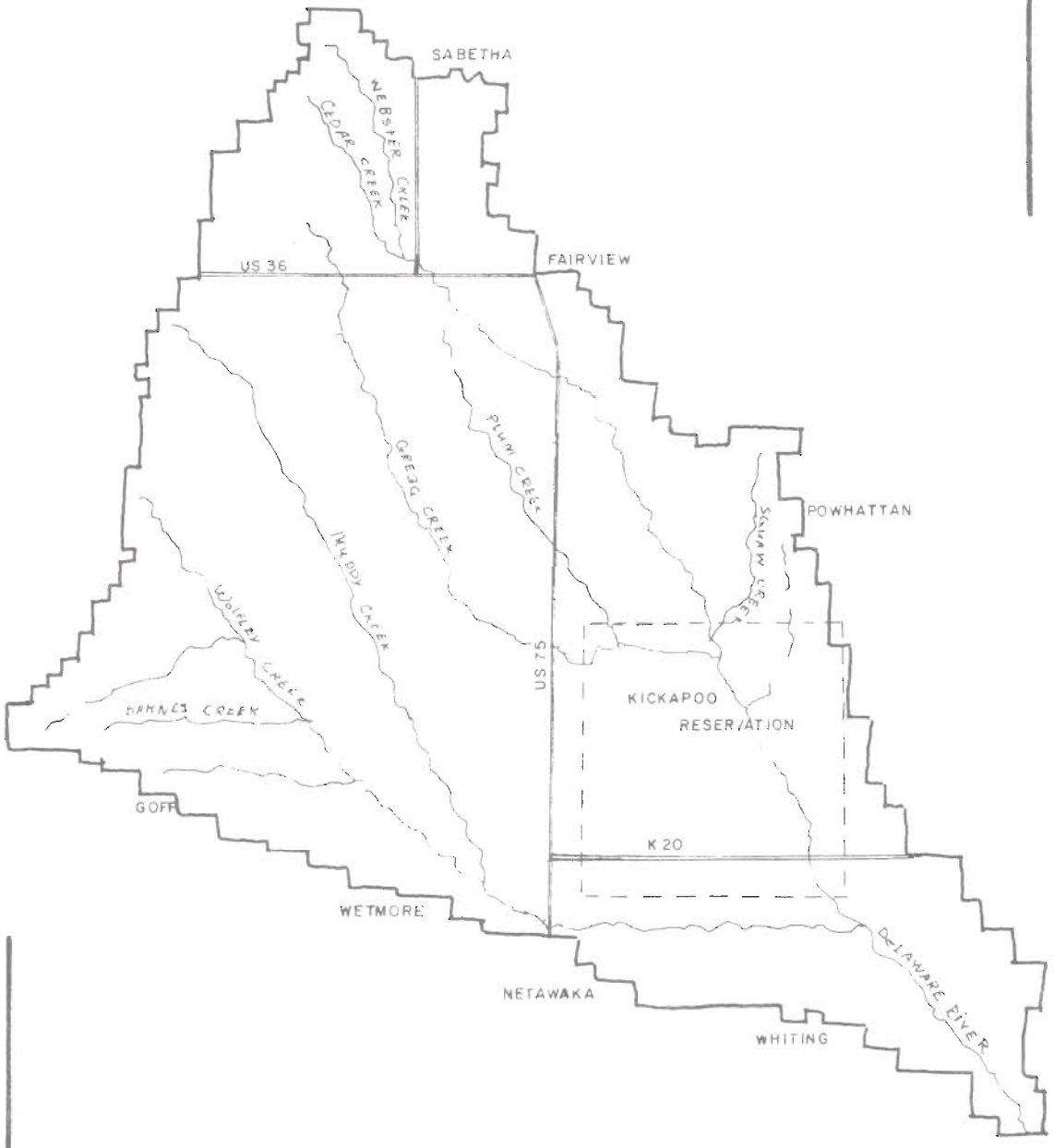
6. Economic Evaluation:
   a. Interview about 30 percent of flood plain farmers and collect data showing damages from at least two historical floods.
   b. Determine cropping pattern for flood plain reaches. Develop data for input into Econ 2 program (including crop prices and damage factors for foot of depth of flooding).
   c. Determine the number of bridges and length of roads for each reach. Collect data from county engineers to determine flood damages associated with two or more historical flood events and develop a damage curve for other storms.

7. Field Surveys: Begin field surveys for valley sections, road sections and bridge sections. Begin bridge survey of all affected bridges.

GENERAL PLAN

GENERAL PLAN

UPPER DELAWARE and TRIBUTARIES



NEMAHA- BROWN WATERSHED JOINT DISTRICT NO.7, KANSAS

JULY 1978

NBJWD03502

NEMAHA - BROWN GENERAL PLAN
ERRATA

Inadvertant omissions, deletions and erroneous figures in this General Plan are hereby corrected by the corrigenda as follows:

Page 15 3rd paragraph, 1st. line, figure 320 delete and replace with 328.
4th paragraph, 5th line, delete figure 35,995, replace with 17,881.
4th paragraph, 7th line, delete 13,829, replace with 14,986.

Page 15A 1st. line, delete 191, replace with 199.
3rd. line, delete 34, replace with 59.25
5th. line, delete 8576, replace with 9264, also delete 7372, replace with 7726.

Page 28 Table I 2nd column of figures, delete 191 replace 199.

Page 29 Table II Site 24-7 add "M.P." after site no.

Page 30 Table II Site 31-25 add "M.P." after site no.

Page 31 Table IIA add site 3-8 and cost of $30,953.

Page 32 Table IIA Site 12-34A, change to Site 12-35A.
Add site 25-20 with cost of $14,985.

Page 36 Table III add site 26-22 and related figures, in columns 1 thru 9 inc. i.e. 0.63 - IIA - 88 - 84-172 - 10 - 17 - 28 - 36 - 700 respectively.

Page 38 Table III Site 31-25 add "M.P." to site designation.

Page 44 Table IIIA delete site 26-8 from the table.

Page 47 Table V line 6 in "quantity" column. Delete figure 197 replace with 199.

Line 13 in "quantity" column, delete 14,224 replace with 29,026.
Line 14 in "quantity" column, delete 45,012 replace with 37,263.
Line 15 in "quantity" column, delete 10,029 replace with 10,309.

Corrigenda concurred in by: Gale E. Miller, President
Planning Consultant Milton E. Saffry

GENERAL PLAN

NEMAHA-BROWN WATERSHED JOINT DISTRICT NO. 7

For The

Upper Delaware and Tributaries Sub-Watersheds

Atchison, Brown, Jackson, and
Nemaha Counties, Kansas

Prepared Under the Authority of the Kansas Watershed
District Act, Section 24-1201-33 with Assistance by

U.S. Department of Agriculture
State of Kansas
Division of Water Resources
State Conservation Commission

May 1978

Nemaha-Brown Watershed Joint District No. 7, Kansas

Board of Directors

Gale Miller, President
Sabetha, Kansas

John F. Gernon, Vice-President
Hiawatha, Kansas

Rueben Finger, Secretary
Horton, Kansas

Reo Strahm, Treasurer
Sabetha, Kansas

Walter Spellmeier
Powhattan, Kansas

William Simpson
Horton, Kansas

Lambert Hermish
Netawaka, Kansas

Delwin Meyer
Sabetha, Kansas

Craig Mitts
Netawaka, Kansas

Plan prepared by

Milton E. Saffry, Holton, Kansas

Watershed Planning Consultant

TABLE OF CONTENTS

GENERAL PLAN

NEMAHA-BROWN WATERSHED JOINT DISTRICT NO. 7

For The

Upper Delaware and Tributaries Sub-Watersheds

Atchison, Brown, Jackson, and

Nemaha Counties, Kansas

May 1978

AUTHORITY

This general plan, together with estimates of cost for installation, operation and maintenance of the proposed works, and information as to the location and extent of areas benefited by the proposed works, has been prepared pursuant to the requirements of Section 24-1213 of the Kansas Watershed District Act. Technical assistance in development of the general plan was obtained from the Soil Conservation Service under authority of Public Law 566, 83rd Congress, 68 Stat. 666, as amended (pl 566).

The Kansas State Conservation commission contracted for engineering services and provided staff assistance in drafting the plan.

SUMMARY

Upon adoption of this general plan and an official method of financing as provided by Section 24-1213 of the Kansas Watershed District Act, Nemaha-Brown Watershed Joint District No. 7, will cooperate with the federal government, the State of Kansas, and the Atchison, Brown, Jackson and Nemaha County Conservation Districts to implement a program for soil conservation, flood prevention, water supply, water quality improvement, and public recreation within the boundaries of the watershed district as provided herein.

Nemaha-Brown Watershed Joint District No. 7 includes 173,110 acres in the glaciated region of north east Kansas in Atchison, Brown, Jackson and Nemaha Counties. The Kickapoo Indian Reservation containing 19,200 acres lies in the south eastern portion of the district.

The major watercourse in the watershed is the Delaware River from its headwaters in north eastern Nemaha County to one half mile north west from Muscotah in north western Atchison County.

The program to be implemented will include soil conservation practices, flood prevention, water supply, water quality improvement and public recreation. The watershed district will encourage installation of traditional soil conservation measures. Additionally, where traditional landowner initiated conservation measures are insufficient to properly maintain soil productivity, the district will encourage and participate in implementation of such

practices as grade stabilization structures. Nearly all soil conservation measures assist in flood reduction. Many flood detention structure sites qualify for PL 566 assistance. The district will actively participate in installing PL 566 qualified structures as well as measures too large or costly to be included as conservation land treatment, but too small to qualify for PL 566 assistance. (i.e. detention dams). Within the limits of physical feasibility, water storage greater than needed to achieve flood reduction goals will be promoted where sponsors are available. Water quality improvement in the form of sediment load reduction will be an incidental benefit from conservation land treatment and flood reduction. Further water quality improvement will be encouraged whenever possible. Sponsors for public recreational facilities will be actively sought whenever a site feasibility permits.

Floodwater retarding structures installed with PL 566 assistance will be operated and maintained by the watershed district. Conservation land treatment measures and detention dams will be operated and maintained by owners of the land on which they are installed. Public recreational facilities and water supply facilities will be operated and maintained by local sponsors other than the watershed district.

Any legal source of cost assistance for installation of the projects proposed in this plan will be actively pursued. The most desirable cost assistance for project installation is that which allows the project to become operational soonest at the least local cost.

Return to R
B

JAN 14 1993

KANSAS STATE BOARD OF AGRICULTURE
Sam Brownback, Secretary

DIVISION OF WATER RESOURCES
David L. Pope, Chief Engineer-Director
901 S. Kansas Avenue, Second Floor
Topeka, Kansas 66612-1283
(913) 296-3717 Fax (913) 296-1176

January 12, 1993

MR GALE E MILLER PRESIDENT
NEMAHA-BROWN WJD NO 7
PO BOX 70
HOLTON KANSAS 66436

Re: General Plan Amendment No. 2

Dear Mr. Miller:

Please find enclosed the Chief Engineer's Report approving the General Plan Amendment No. 2 and a copy of the amendment, signed by the Chief Engineer on January 12, 1993.

Please contact us if you have any further questions.

Very truly yours,

Galen E. Thorsell, P.E.
Engineer
Water Structures Section

GET:cp

pc: Mr. Ken Kern

The watershed district has no interest in owning land in fee title except as required to achieve stated project objectives.

CHARACTERISTICE OF THE DISTRICT

History

Interested prople in the watershed district first held a meeting to consider watershed district problems on Dec. 30,1955. A steering committee to direct efforts for district formation was selected on Jan. 3, 1956. The district was formally incorporated on Jan 21, 1958.

The Kansas Watershed Review Committee declined to take any action on an application filed in 1958, for planning assistance under the Watershed Protection and Flood Prevention Act (PL 566) because the Nemaha-Brown Watershed District conformed to political boundaries on the southern end rather than natural watershed boundaries.

An effort to correct the boundaries was initiated in early 1960 and finalized in 1975. Adjustments and transfers of lands involved the district, Delaware Watershed Joint District No. 10, and the Little Delaware Mission No. 5 were necessary to effect this boundary correction.

Subsequently another application for planning assistance under PL 566 was filed in October of 1975. This application was approved and the watershed district is now awaiting SCS priority for planning for a federally funded watershed project.

Physical.

Nemaha-Brown Watershed Joint District No. 7, is located in Atchison, Brown, Jackson, and Nemaha Counties in north east Kansas.

Total watershed district area is 173,110 acres, with a floodplain of approximately 22,110 acres. Approximately 2,300 acres lie in Atchison County; 70,400 acres in Brown County; 27,170 acres in Jackson County; and 73,240 in Nemaha County. The Project Map shows the location of the watershed in relation to the state. The watershed district is approximately 19 miles wide and 24 miles long.

The Delaware River, the major water course in the watershed heads in north eastern Nemaha County at the northern boundary of the watershed district. The Delaware River flows south-southeasterly through the watershed district to Muscotah. It exits the watershed district at the district's southern lower terminus. After exiting the district one half mile north west from Muscotah in north western Atchison County, the Delaware River turns south-southeast and flows through the Corps of Engineers' Lake Perry, to empty into the Kansas River near Lecompton, Kansas. Major tributaries to the Delaware in the watershed district include Wolfley, Muddy, Gregg, and Plum Creeks.

Topography in the district ranges from steeply rolling, dissected upland to a flat 1/4 to 3/4 mile wide floodplain. Glacial material left after recession of the Kansas Glacier covers much of the underlying bedrock. Therefore typical rock controlled topography is absent in the district. Loess up to 12 feet thick was deposited in the district as the glacier left. Present topography is essentially eroded glacial moraine and loess.

Elevations range from 1370 feet above sea level to 940 feet at the outlet, giving a total of 430 feet drop in about 29 miles.

The major upland soils include silty clay loams of Grundy, Wymore, Pawnee, Shelly, Summit and Martin series. Minor soils include Marshall-Sharpsburg, Morrill, Sogn, Summit-Labette, Gara, Burchard and Stienaner clay loams. Judson, Kennebec and Wabash soils are the main floodplain soils.

The watershed, located in the Dissected Till Plains section of the central lowlands physiographic province, will support a natural tall grass (bluestem) prairie sod. Today more than four fifths of the watershed district is tilled, and much of the remaining grassland is improperly managed.

The total woodland area (1,750 acres) is found mostly in narrow bands adjacent to streams on bottomland sites or on steep slopes. Woodlands are moderately stocked and occur in two distinct types in the district: (1) Red oak-bur oak-hickory in the uplands and (2) bur oak-hackberry walnut and ash in the lowlands. Both woodland types contain a good mixture of high value species.

The watershed lies in the path of alternate masses of warm moist air moving north from the Gulf of Mexico and cold, comparatively dry air moving south from polar regions. Consequently the area is subject to frequent and abrupt weather changes. Thunderstorms are common and occasionally cause flash floods. The watershed is also subject to extended periods of below normal rainfall with resulting drought conditions. Average precipitation at Horton, five miles east of the district averages 33.0 inches, but has varied from 10 to 50 inches. The six month growing season, 171 days from April through September, is the period of occurrence of about 74% of the normal annual rainfall.

Recorded temperature extremes are 112 and -33° F. Average maximum July Minimum January temperatures are 90° and 27° respectively.

Economic and Social

The economy of the district is based on the production of agricultural products. Agri-business and local markets provide minor influence. Sabetha, population 2,500; Fairview, population 320; and Powhattan, population 140; are located in the district boundaries. Muscotah, Whiting, Netawaka, Wetmore and Goff, towns with populations of less than 300 each, are located just outside the district. Total population of the district is approximately 3,900.

Within the district are some 750 operating units averaging 240 acres in size. About 81% of these operators are cooperators with the local conservation districts.

Land use in the district is:

Land use	Total Acres	Percent
Cropland	143,682	83 (includes about 32,000 acres tame grass)
Grassland	20,000	12
Woodland	3,462	2
Other land	5,193	3

Most farms are diversified. Wheat, corn, sorghums, alfalfa and soybeans are principal cultivated crops. Gross value of annual production for the composite acre is estimated at $230. Current agricultural land values are estimated at $550 per acre for cropland and $275 per acre for pastureland.

A secondary road grid links the watershed district to U.S. Highways 75 and 36 and to Kansas Highways 20 and 9. North-south transportation is provided by U.S. Highway 75 and east-west transportation is provided by U.S. Highway 36 and Kansas Highways K-20 and K-9. Rail transportation is provided by four lines operated by Chicago, Rock Island, and Pacific; Union Pacific; and Missouri Pacific Railroads.

Fish and Wildlife

Rough fish predominate in perennial streams. In the watershed district only the lower reaches of the Delaware River, Muddy and Wolfley Creek maintain water dependable enough to support a sustained fishery. Many farm ponds in the area have been stocked with combinations of largemouth bass, bluegill, channel catfish and other species. Farm ponds provide fishing that ranges from poor to excellent, depending on the individual pond and the kind of management applied.

Mammals in the district include beaver, muskrat, raccoon, skunk, coyote, fox and deer. White-tailed deer populations are increasing. Deer hunting by permit has been allowed in recent years.

The Kansas Academy of Science does not list any amphibians, fished, mammals, or reptiles that may be found in the watershed as threatened or endangered species. The Academy does list the peregrine falcon (Falco Peregrinus) and the whooping crane (Grus americana) as endangered birds that may be transient residents in the watershed area. The bald eagle (Haliaeetus leucocephalus) and the prairie falcon (Falco mexicanus) are listed as threatened species that may be transient or winter residents.

Recreation

Perry Reservoir is the largest and most complete facility for water sports, camping, hiking, fishing and hunting. The U.S. Corps of Engineers and Kansas Forestry, Fish and Game Commission provide these opportunities. Lesser facilities include State Fishing Lakes in Shawnee, Nemaha, Jackson and Atchison Counties. Numerous privately owned lakes and ponds also provide opportunities for fishing and water fowl hunting.

Projects of Other Agencies

Perry Lake is a Corps of Engineers project on the Delaware River about 22 miles below the southern terminus of the Nemaha-Brown watershed district. Built primarily for flood control on the Kansas and lower Delaware Rivers, the reservoir also provides hunting, fishing, and other water based recreation, and water supply. The Perry Lake complex includes a state park and a state wildlife management area.

NATURE OF SOIL AND WATER PROBLEMS

Accumulated total flood and related damages sustained annually in the watershed district are conservatively calculated to be $2,895,000. Damage to Perry Reservoir by sediment deposition is not included.

Floodwater Damage

Flooding is one of the major watershed problems. Flooding one to three times annually has decreased production 20 to 25% below potential. Annual loss to agricultural production by sedimentation in natural and constructed channels, and swamping of isolated areas is calculated at $973,375. Other agricultural damages, such as to buildings, machinery, stored feeds, livestock pens and feeding

developments add another $14,250 per year. Non-agricultural damages to utility lines, power transmission lines, bridges, railroads, and federal, state and farm to market roads require repairs and cause loss of service amounting to $15,750 annually. Total annual flood damage in the floodplain is estimated at $1,000,000.

Erosion Damages

Sheet and gully erosion is the major problem on the upland areas. Unstable channels occur near tributary headwaters as well as on main streams. Stream channels are typically cut through loess and glacial materials where degradation is seldom limited by rock. Under these conditions, channels tend to shape their own cross-section and gradient depending on sediment load, slope of the terrain and vegetative conditions.

The 125,330 acres of upland cropland and the 18,120 acres of grassland are subjected to sheet and gully erosion that causes intensity of use reductions up to 30% on upland cropland and 15% on upland pasture. These losses account for an estimated $1,895,000.00 annually.

Approximately 9,000 upland acres are contributing heavy silt and sediment loads to the drainage system within the watershed. About 90% of these areas are severely eroded, abandoned cropland. The remaining 10% are roadsides, feed lots, and actively eroding gullies. These areas require treatment before the affected structures of this plan can be installed and expected to function properly. About 4,200 acres of this sediment producing area would respond to usual land treatment measures; but benefits may not exceed costs.

Without grade stabilization, an effective land treatment program cannot be installed and maintained. Unstable channels do not provide suitable outlets for land treatment measures such as terraces. Unprotected land is depreciating and will continue to depreciate by erosion. Unless treated, an anticipated 2,300 acres will be totally voided within the next 50 years.

Sediment Damage

Sediment deposition is of major importance throughout the floodplains in the watershed district. Deposition is of greatest impact on lower reaches of the Delaware River and its major tributaries. Sediments deposited in stream channels are making streamflow more sluggish. This results in more frequent flooding.

Deposition on floodplain soils, while causing some damage to the soil, also blocks field drains, fills road ditches, and smothers growing vegetation. Recreational areas clogged with sediment and debris after flooding are less inviting and are expensive to restore to their original state.

The Delaware River and its tributaries contribute large volumes of sediment to Perry Reservoir. This sediment is deposited at a rate of 1.4 acre feet per square mile of drainage area annually. Nemaha-Brown Watershed District contributes about one-fourth to one-third of this sediment load.

Drainage

Drainage problems are caused by sediment and debris, particularly in the lower reaches of the floodplain. This problem can be

partially eliminated by flood protection. Drainage problems remaining after flood protection measures in this plan have been installed will be handled primarily by individual land operators.

Irrigation

Groundwater supplies are not adequate for irrigation in this watershed. There is limited interest among farmers for irrigation water to supplement natural rainfall. Surface water supplies could be developed in some of the floodwater retarding structures, but total volume would be small.

The Tribal Council for the Kickapoo Indians is taking a serious look into the feasibility of supplemental irrigation as a part of their Water Use and Reservation Development Program.

Although irrigation water storage is not included as an item in the development of the watershed, specific requests from farmers and the Kickapoo Indians will be given due consideration.

Municipal and Industrial Water

Groundwater supplies have been generally of satisfactory quantity and quality for domestic needs. Farm ponds have been installed for supplemental stockwater and to allow increases in livestock production. The numerous towns and municipalities, however, have historically had trouble obtaining adequate water sources.

The western part of the district is looking toward the rural water district in Nemaha County to provide domestic water, while the southern part of the district is looking to a Jackson County based water district for their water.

The Kickapoo Tribal Council is actively planning for a municipal and domestic water supply for immediate installation and are asking the district to initiate a co-sponsorship for industrial and fire protection supply developments. The city of Sabetha also has requested co-sponsorship of a multipurpose reservoir.

EXISTING WORKS OF IMPROVEMENT

In the past sixty years, efforts have been directed toward easing the flooding problem. Stream straightening, channel enlargement, and surface drainage systems with bedding and furrowing have been designed, installed and financed through numerous drainage districts. Drainage systems are most common in the lower 10 miles of the Delaware River floodplain and the lower 10 miles of major tributaries, namely Muddy and Gregg Creeks.

The Atchison, Jackson, Brown and Nemaha County Conservation Districts are actively engaged in carrying out a soil and water conservation program in the watershed in cooperation with individual farmers and the Soil Conservation Service. The watershed intends to continue its support of this program.

Numerous federal, state, county, and privately financed conservation facilities have been installed within a fifty mile radius from the watershed. They include Perry Reservoir, Brown State Fishing Lake, Nemaha State Fishing Lake, Shawnee State Fishing Lake, Pottawatomie State Fishing Lake, three flood retarding structures in Nebo Creek subwatershed, Holton's Prairie Lake, Horton's City Lake,

and Sabetha City Lake. The latter three lakes were constructed for municipal water supply. In addition several grade stabilization road structures have been built in cooperation with state and county road agencies and privately owned recreational enterprises. Facilities at Sycamore Springs, Sun Springs, and Cedar Lake are examples of improvements made in cooperation with recreational enterprises.

The U.S. Corps of Engineers installed Perry Dam and reservoir on the lower Delaware River in 1969. Objectives were to achieve flood control, provide recreation and provide water supply. Sites have been developed for youth, church and school organizations, and for housing developments.

The Upper Delaware and tributaries watershed project, along with other upstream watershed district programs, is designed to help lessen the maintenance of the Corps' facility by reducing uncontrolled floodwaters and debris from entering the reservoir. This and other watershed projects will also materially reduce the volume of sediment being deposited in Perry Reservoir.

WORKS OF IMPROVEMENT TO BE INSTALLED BY THE DISTRICT

A system of 124 Floodwater retarding-grade stabilization * structures; 5 multipurpose structures providing municipal and industrialwater and recreational facilities; and 191 detention-grade stabilization * structures will be installed. Location of these 320 structures

* Grade stabilization features will be considered and designed as a component of all dams to the utmost of feasibility.

is shown on the project map. Physical data and estimated costs of installation are presented in Tables II, II-A, III and III-A

An installation of jetties and gabions will be placed on the right-angle turn in the Delaware River, SW 1/4 Section 19, T5S-R17E, to stabilize an instance of severe bank erosion.

All structures will be earthen dams with pipe outlets and vegetated or rock emergency spillways provided to release runoff exceeding reservoir storage capacity safely past the embankment. Emergency spillways have been planned so their chance of operation in any one year is 4% or less. Guidelines for these calculations are found in the Soil Conservation Service's Engineering Standards. A cross section of a typical structure is shown on page 49.

The combined 320 structure system will control runoff from 172 square miles, or 64% of the watershed area.

The 124 floodwater retarding-grade stabilization structures range in drainage area size from 16.4 to 0.31 square miles and control 117 square miles. Floodwater retarding storage ranges from 2.1 to 4.5 inches runoff from the drainage areas. These structures provide a total of 35,995 acre feet of flood storage. Sediment storage ranges from 1.0 to 3.38 inches from the drainage areas and totals 13,829 acre feet. This volume should be adequate for at least 50 years of sediment accumulation. Dam heights range from 17 to 42 feet. Structure data is shown on pages 34 through 38. Benefit/Cost ratios are shown in Table II.

The 191 detention grade stabilization structures range in drainage size from 0.14 to 1.35 square miles. They control a total of 34 square miles. Detention storage in these reservoirs ranges from 1.8 to 4.0 inches runoff from respective drainage areas and totals 8576 acre feet. Sediment storage totals 7372 acre feet and ranges from 1.0 to 3.4 inches. Sediment storage is provided for a 50 year accumulation. Dam heights range from 15 to 48 feet. Structure data for these dams is displayed on pages 39 thru 45. Benefit/cost ratios are shown on Table II - A.

The watershed district and the Kickapoo Tribal Council are co-sponsoring multipurpose dams, sites 15-30, 20-17; 21-14A and 24-7 shown on the project map.

The council has recently caused two long-time plans to be prepared for the Reservation. These are: A Water Use Study and an Industrial Development Plan. Both of these plans are being systematically installed, contingent upon availability of funds for Reservation development.

The 4 multipurpose sites are in conformity with the long-time plans for the Reservation. Site 20-17 has a high priority as it will serve as floodwater retardation, municipal water supply, and recreation; Site 24-7 to serve as floodwater retardation, fire protection, water supply and recreation; Site 21-14A to serve as floodwater retardation; Industrial and supplemental irrigation water source and recreation; Site 15-30 to function as floodwater retardation and recreation.

Further, the district and city of Sabetha will co-sponsor a multipurpose structure, site 31-25 on the project map. This installation will function as floodwater retardation, municipal and industrial water supply, and recreation for Sabetha.

There are no construction costs assigned to the watershed district in Table I for the multipurpose sites. Co-sponsors to the project, the Kickapoo Tribal Council and the City of Sabetha will procure land rights for the reservoir, both spillways, and recreational developments. Agreements for maintenance of the facility will be made before construction begins.

Facilities for water sports, fishing and camping are being planned at this reservoir.

The multipurpose dams have drainage areas of 50.3 square miles. Total storage of 19,973 acre feet includes 9974 acre feet for floodwater detention, 3995 acre feet for water supply, and 6004 acre feet for recreation. Heights of the dams are 45, 38, 39, 31 and 44 feet.

All structures will have single state inlet principal spillways with the elevation set at or above the 50 year sediment accumulation level. Principal spillways will be made of reinforced concrete, welded steel, or corrugated metal, depending on structure size and classification.

In addition to the above cited structural measures there is a need for stabilization of other critical areas amounting to about 4475 acres. These areas are considered too severely eroded to be stabilized effectively by normal conservation land treatment measures for arable land. Measures needed include establishment of permanent vegetation, shaping and seeding of vegetated waterways, and some 160 minor grade stabilization structures. A combination of these measures is needed at many sites. Minor grade stabilization structures may consist of simple concrete overfalls and/or small earth embankments with corrugated pipe spillways.

Critically eroding and silt producing areas, and the contemplated stabilization measures are primarily located in natural drainage ways. Vegetated areas will have restricted use for hay, hayseed, or grazing.

The district will cooperate with the state, county, and township road departments wherever feasible to stabilize eroding and silt producing areas. Combination road culverts grade stabilization dams, similar bridges, and shaping and seeding roadside ditches are included in control measures the watershed district will cooperate to install. Combination road bridge grade stabilization dams could be used at about 25 sites. A cumulative total of some 95 miles of roadside ditches is eroding rapidly.

PROJECT FINANCING

The estimated cost of works of improvement as shown in Table I is $21,481,544. Construction costs for individual structures are shown in Table II. The estimated costs for land treatment measures in critical areas are $867,675. Costs for installation of these measures may be shared by federal, district, and landowner funds.

Federal costs for floodwater retarding-grade stabilization structures include funds for the total costs of construction, engineering services and construction inspection, and part of the costs for project administration.

Federal and state costs for the detention-grade stabilization dams include about 60% of the construction costs, part of the engineering costs, construction inspection, and project administration costs.

District costs for the floodwater retarding-grade stabilization structures include all of the out-of-pocket costs for land

rights and part of the project administration costs. District costs for the detention-grade stabilization dams include about 20% of the construction costs, part of the engineering costs, and part of the project administration expenses. Final allocation of cost to the district for detention-grade stabilization dams will depend on federal and state programs and cost sharing rates available at the time of construction. The out-of-pocket district land rights costs for detention dams are expected to be negligible.

Other costs, as listed in Table I include about 20% of the construction costs of the detention dams that will be paid by the land owners and/or immediate beneficiaries.

Construction costs include general construction and vegetative establishment work of the character normally performed by contractors. Construction cost estimates for the 124 floodwater retarding-grade stabilization structures and the multipurpose dams in this plan are based on computations from quantities derived from U.S.G.S. quadrangle survey information and correlated data from other watersheds with unit costs for similar work on projects currently under construction plus a contingency allowance of 12%. Construction cost estimates for the 191 detention grade stabilization dams were based on comparisons of costs for similarly constructed dams. At the time of project installation, additional surveys will be needed as a basis for structural design and construction costs estimates. Geologic drilling and soil mechanics tests and analysis will be performed as necessary to verify site and foundation conditions.

Engineering services include all direct and related costs of the services of engineers and geologists for surveys, geologic site investigations, soil mechanics, structure design and construction plans and specifications. Engineering services costs were computed as a percent of construction costs where functions are proportional to construction cost. Flat rater were used in computing functions with relatively fixed costs.

Project administration costs include the costs of construction inspection and supervision, general administration and administration of contracts. General administration includes overhead costs of administration and program supervision at all levels, both district and federal, concerned with the installation of the improvements. Administration of contracts includes federal assistance rendered to the district in preparing invitations to bid and in awarding construction contracts.

Administrative costs also include district costs of mailing bid invitations and the salary and expenses of the contracting officer in administering construction contracts.

The district has determined that no dwelling or farm operation relocation will result from installation of the floodwater retarding-Grade stabilization structures or the detention-gradestabilization dams. Relocation costs associated with the multipurpose structures will be paid by sponsors other than the watershed district.

Land rights costs are costs of land easements and rights-of-way, including legal counsel, recording fees, and modifications of roads and other improvements. Cost estimates were based on pre-

liminary information and are subject to change at the time of actual land rights acquisition.

All district costs were estimated by the Board of Directors of the Nemaha-Brown Watershed Joint District No. 7.

PROJECT INSTALLATION

The works of improvement in this plan, as it relates to the PL 566 projects, are proposed to be installed within a ten year period following the authorization of federal assistance.

Subsequent to approval of PL 566 funding, the Soil Conservation Service will furnish engineering services and commence preparation of construction plans and specifications for the works of improvement for those floodwater retarding-grade stabilization structures.

The Board of directors will obtain all land rights, except at the multipurpose sites. The board will make arrangements with the county commissioners for abandonment or modification of county roads requiring such action. Relocation or modification to pipelines, communication lines, or other public utilities which are necessary in connection with project installation will be made by the board.

Contracts for construction of the structural measures will be awarded on the basis of competitive bidding. Separate contracts will be awarded for general construction and for vegetative establishment. The district will appoint a contracting officer and will bear the cost for contract administration. Administrative assistance

can be obtained, if needed, from the Soil Conservation Service to help prepare invitations to bid, and in awarding contracts.

Funds to reimburse the district for construction costs for works of improvement (floodwater retarding and grade stabilization structures) will be obtained from the federal government through Project Agreement executed with the Soil Conservation Service. A Project Agreement will be executed for each group of structural works to be included in a construction contract.

The Soil Conservation Service will furnish engineering services for construction and inspection, preparation and computation of partial payment estimates, final inspection, and acceptance of the work.

Construction can be started when the district has complied with state laws relating to approval of construction plans; easements, and rights-of-way have been obtained; and federal or other funds and assistance are available.

Technical assistance, inspection services, and grants-in-aid for construction from the Soil Conservation Service are contingent upon appropriation of funds for these purposes.

Those works not eligible for PL 566 assistance are proposed to be installed as rapidly as possible, being wholly contingent upon the availability of federal and/or other public funds, landowner funds, and engineering services for design, layout and construction.

BENEFITS AND AREAS BENEFITED

The flood abatement and land treatment programs outlined herein will directly benefit 750 farm families within the watershed district. Combination structures for grade stabilization and stream flow regulation will result in benefits both up and down stream from the structural measures. The project area benefited by structural measures is 31,248 acres from grade stabilization and 22,110 acres from floodwater damage reduction. These areas are shown in red, green and yellow on the project map.

Reduction in grade accomplished by works of improvement will make it possible to install and maintain a complete and effective system of land treatment. Sheet and gully erosion on the upland areas of the watershed will be substantially reduced.

Grade stabilization will have two major effects on the benefited area: (1) It will make possible the installation and maintenance of a land treatment program to arrest erosion and prevent further land damage, and (2) It will allow reconditioning of presently damaged land, making possible the use of improved management on the entire benefited area.

A substantial reduction in cost of maintaining roads and bridges in the area will be realized. The reduction in cost of road and bridge repair will release funds to improve and modernize the existing road system.

The installation of combination floodwater retarding-grade stabilization structures will benefit floodplain areas downstream. These benefits are derived from reduction of flooding to crops and pastures on the tributaries as well as on the main stream.

Secondary benefits stemming from the project are realized from transporting, processing and marketing greater quantities of agricultural commodities produced as a result of improved management. Secondary benefits include: Increased net return to suppliers of farm equipment and materials; increased net return to local retailers and wholesalers; increased farm income; and by any other increase in net returns resulting from marketing or using project-increased goods or services. Secondary benefits from a national viewpoint were not considered pertinent to the economic evaluation.

Recreational benefits from the multipurpose sites will accrue to the general public. The 315 combination floodwater retarding-grade stabilization dams and the 5 multipurpose dams will have a combined sediment pool area of 3791 acres. These pools will afford recreational opportunities for fishing, boating, and hunting. Access to all sites except multipurpose sites No. 15-36, 20-17, 21-14A, 24-7 and 31-25 will be controlled by the landowner.

A general benefit to the fish and wildlife resources of the area is expected. Stream fishing will be improved as a result of more stabilized flow below floodwater retarding structures. Permanent storage pools in the floodwater retarding reservoirs will increase fishing opportunities in the watershed. Increased

water ares of these widely scattered dams will benefit waterfowl by providing resting areas and some winter habitat. Upland game birds will be displaced from the permanent pools of the structures, but terrestrial species will benefit from flood reduction in the protected bottom lands and from areas which would be voided without the project. Land owners and operators will be encouraged to include wildlife conservation practices along with other conservation measures on their land.

The above benefits attributable to planned structural measures total $2,936,650.00 on an average annual basis. Individual items of benefit are shown on Table IV.

PROVISIONS FOR OPERATION AND MAINTENANCE

The 124 combination floodwater retarding-grade stabilization structures eligible for PL 566 program assistance will be operated and maintained by the Nemaha-Brown Watershed Joint District No. 7. All structural measures will be inspected by representatives of the watershed district at least annually and after each heavy runoff producing storm, and after any other condition that may adversly affect the operation, maintenance or safety of the structures. Items of inspection will include but not be limited to the condition of the principal spillway and its appurtenances, the emergency spillway, the earth fill, the vegetative cover of the earth fill and emergency spillway, and any fences installed as a part of the

structures. Nemaha-Brown Watershed Joint District No. 7 will maintain a record of maintenance and inspections. Provisions will be made for free access by district, state, and federal representatives so the structure system may be inspected at any time.

The Nemaha-Brown Watershed Joint District No. 7 will assume responsibility for by-passing the natural flow of the stream through the PL 566 reservoirs to satisfy downstream water rights acquired in accordance with the water appropriation act. In addition, the district may make releases, if requested from storage they have acquired, to meet downstream water needs during drought periods, or for pool drainage for operation and maintenande.

The estimated average annual operation and maintenance cost for structural measures is $16,000. Necessary maintenance will be accomplished through contributed labor and equipment and/or hired labor and equipment. Funds for accomplishing the maintenance work will be obtained from an annual tax levy within the district. An agreement providing for operation and maintenance of the structural measures will be executed by the Nemaha-Brown Watershed Joint District No. 7 before federal funds are available.

The multipurpose structures, sites No. 15-30, 20-19, 21-14A, and 24-7 will be operated and maintained by the Kickapoo Tribal Council. Site 31-25 will be maintained by the city of Sabetha. Therefore no cost to the watershed district is shown.

The remaining 191 structures designated as detention-grade stabilization structures will be maintained by the landowners and operators on whose land the measures are installed. This

will be done under agreement between the watershed district and the conservation districts serving the area in which the measures are installed. Maintenance needs will be determined through periodic inspections by the watershed district.

Table I
Estimated Installation Cost of Proposed Works (1978)
Nemaha-Brown Watershed Joint District No. 7, Kansas

Dollars

Item	Unit	No.	Federal	District	Other	Total
CONSTRUCTION						
Critical area treatment, vegetative	Acres	4,475	$ 83,775	$ 224,030	$ 337,925	$ 645,730
Grade Stabilization	No.	160	29,360	76,610	115,975	221,945
Flood Retarding Structures(PL566)	No.	124	7,515,410	-------	-------	7,515,410
Detention-Grade Structures	No.	191	------	544,145	3,083,489	3,627,634
Multipurpose Structures	No.	5	2,075,340	-------	1,998,210	4,073,550
Recreational Facilities	No.	5	513,210	-------	342,140	855,350
Jetties and Gabions	L. Ft.	300	-------	6,000	2,000	8,000
Sub-Total Construction			$10,217,095	$ 850,785	$ 5,879,739	$16,947,619
Engineering			$ 1,061,345	$ 17,200	$ 20,250	$ 1,098,795
Project Administration						
Construction Inspection			$ 1,465,000	$ 320,540	$ ------	$ 1,785,540
Other			505,200	80,140	4,250	$ 589,590
Sub-Total Project Administration			$ 1,970,200	$ 400,680	$ 4,250	$ 2,375,130
Land Rights			$ 250,000	$ 650,000	$ 160,000	$ 1,060,000
Project Totals			$13,498,640	$1,918,665	$ 6,064,239	$21,481,544

Table II

Installation Costs Floodwater Retarding-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Dollars (1978 Rates)

Site	Construction	Site	Construction	Site	Construction
1-3A	$ 50,050	9-31	$ 67,000	17-21	$ 44,000
1-18A	54,000	10-7	31,000	20-9	41,100
1-23	13,200	10-11	35,800	20-17MP	760,000
2-21A	59,500	10-12B	53,100	21-4	49,000
2-29	20,750	10-15	15,000	21-9A	91,250
2-31	36,500	11-23	58,600	21-14	30,150
3-6	53,700	12-1	28,000	21-14A MP	900,000
3-9	40,000	12-2	26,000	22-25	52,250
3-12	45,300	12-3	25,000	22-36	74,500
3-16	45,700	12-3A	24,500	23-12A	23,450
3-17	50,200	12-33	90,500	23-27	63,400
3-18	50,000	13-21	43,000	23-35	59,100
3-18A	60,500	13-22	43,000	24-7	800,000
4-3A	42,500	13-27B	79,000	24-13	38,600
4-4A	40,600	13-28	39,000	24-19	62,000
4-5	61,500	14-6	53,300	24-19A	46,100
4-13	35,700	14-7A	23,000	24-20	36,850
4-13A	46,900	14-12	66,450	24-30A	54,600
4-14	49,750	14-18	60,500	25-8	38,250
4-14A	38,200	14-18A	71,000	25-17	56,600
				25-18	32,350
5-35	23,100	14-20	103,000	25-20	72,000
6-26	71,600	14-24	42,150	25-29	52,750
6-30	57,300	15-25	20,500	26-3	53,700
6-32	54,750	15-27	61,000	26-3A	58,150
6-34	17,000	15-28	45,100	26-10	62,500
7-19	25,000	15-30 MP	198,900	26-14	31,750
7-23A	56,400	16-23	21,900	26-15	50,500
8-16A	61,300	17-16	36,500	26-15A	60,100
9-1	54,000	17-20A	16,500	26-22	44,500
9-25	57,100	17-20B	26,300	26-23	56,750

Table II

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Site	Construction	Site	Construction	Site	Construction
26-23A	$ 34,150	28-32	$ 48,400	31-2	$ 40,000
26-33	31,100	28-34	57,350	31-3	54,900
27-6	18,150	28-34A	64,850	31-7	75,000
27-9	82,000	29-1	58,300	31-11	44,500
27-30	58,750	29-10	61,750	31-13	110,000
27-31A	37,300	29-10A	60,600	31-19	62,100
28-4	55,000	29-15	29,800	31-25	1,470,000
28-5A	70,000	29-15A	45,000		
28-9	48,500	29-22	45,900		
28-10	49,600	29-35	68,250		
28-10B	77,000	29-36	76,750		
28-11	48,500	30-16	37,750		
28-12	37,850	30-17	49,150		
28-14B	45,250	30-21	74,000		
28-31	52,000	30-30	31,000		

Benefit/Cost ratios for these structures(less the multipurpose dams) range from 1.0:1 to 4.49:1. Average B/C ratio of all dams is 1.91:1.0

* Grade stabilization features will be considered and designed as a component of all dams to the utmost of feasibility.

Table II A

Installation Costs Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed District No. 7, Kansas

Dollars (1978 Rates)

Site	Construction	Site	Construction	Site	Construction
1-1	$ 25,150	3-5	$ 25,200	7-17	$ 12,750
1-2	35,950	3-7	14,250	7-18	22,100
1-3	17,600	3-17A	16,800	7-23	26,300
1-7	19,400	3-19	16,600	7-25	17,100
1-12	35,200	4-2	22,600	7-25A	12,400
1-13	31,300	4-3	10,750	7-29	15,900
1-18	12,500	4-4	11,600	7-30	22,500
1-18B	28,100	4-4B	13,900	8-8	17,000
1-19	9,800	4-5A	30,800	8-8A	31,200
1-21	29,100	4-9	18,200	8-10	16,050
1-22	18,250	4-9A	9,200	8-16	24,700
1-23A	30,150	4-14B	15,100	8-17	9,100
1-24	14,300	4-15	10,500	9-2	20,500
1-25	11,150	4-24	8,000	9-25A	16,500
1-26	15,900	5-1	14,700	9-29	16,900
1-27	15,600	5-7	5,200	9-30	18,250
1-34	30,670	5-36	9,400	9-31A	23,400
1-34A	23,750	5-36A	13,600	9-32	29,700
1-35	10,850	6-15	22,350	9-36	18,900
2-15	17,100	6-22	20,450	10-7A	22,100
2-16	15,750	6-27	14,000	10-12	21,500
2-21	17,400	6-27A	14,900	10-12A	10,000
2-22	23,800	6-28	24,600	10-12C	10,400
2-27	16,400	6-29	8,300	10-14	18,500
2-28	25,100	6-33	9,300	10-14A	19,600
2-31A	26,900	6-34A	16,600	10-21	22,850
2-33	28,600	6-34B	10,600	10-22	19,150
3-1	26,250	6-35	16,000	11-14	32,150
3-1A	16,150	6-35A	14,700	11-23A	7,500
3-2	20,350	7-13	22,350	11-25	12,300

Table II A

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Site	Construction	Site	Construction	Site	Construction
11-25A	$ 7,600	17-17	$ 22,400	22-19	$ 26,700
11-25B	9,800	17-17A	13,000	23-1	24,000
11-30	10,000	17-18	24,000	23-2	30,000
11-30A	16,800	17-20	9,000	23-12	20,200
11-31	16,200	17-20C	14,850	23-34	30,600
11-31B	12,100	17-22	20,750	24-5	14,300
11-32	12,100	17-27	11,700	24-6A	14,175
11-32A	12,900	17-28	18,500	24-7A	14,450
11-32B	10,250	18-19	19,200	24-19B	10,250
12-11	12,000	18-20	19,250	24-24	18,250
12-13	16,100	19-18	10,600	24-29	17,100
12-24	8,000	20-4	22,300	24-30	15,750
12-35	22,200	20-9A	14,600	24-31	19,700
12-34A	16,310	20-10	19,250	25-18A	15,400
13-27	12,250	20-16	28,770	25-21	12,300
13-27A	21,000	20-16A	16,900	25-28	17,000
13-34	9,800	20-29	10,300	25-33	14,300
14-7	26,500	20-33	22,500	26-8	16,400
14-8	8,100	21-8	31,750	26-9	18,100
14-16	28,000	21-9	22,000	26-10A	22,750
14-17	27,400	21-11	20,410	26-11	19,250
14-17A	22,750	21-15	19,500	26-16	14,200
14-20A	20,300	21-29	15,150	26-25	17,200
14-24A	14,350	21-32	24,250	26-26	19,500
15-34	24,150	21-32A	17,750	27-5	11,100
15-35	25,300	22-6	19,000	27-5A	24,150
15-36	12,800	22-6B	15,150	27-8	23,500
15-36A	21,700	22-7	21,000	27-8A	26,000
16-13	14,700	22-7A	12,600	27-9A	18,250
16-13A	28,000	22-8	16,750	27-19	9,900

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Site	Construction
27-29	$ 38,100
27-29A	13,200
27-31	7,200
27-33	21,750
28-2	24,000
28-3	22,300
28-10A	22,400
28-13	36,900
28-13A	15,400
28-13B	21,750
28-14	17,800
28-14A	18,250
28-33	13,550
30-21A	17,900
30-28A	29,350
30-29	18,000
31-23	18,600
31-24	18,400

Benefit/Cost ratios for these structures range from 1.0:1 to 4.6:1. The average B/C ratio for all the structures is 1.7:1.0.

* Grade Stabilization features will be considered and designed as a component of all dams to the utmost of feasibility.

Table III

Structural Data Floodwater Retarding-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft	Total Vol. Ac. Ft	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Volume of Fill Cu. Yds
1-3A	.89	I A	70	138	208	8	22	30	36,800
1-18A	.96	I A	142	175	317	11	22	29	48,500
1-23	.55	II A	53	91	144	9	16	17	10,000
2-21A	.81	I A	125	139	264	10	25	35	61,500
2-29	.57	II A	88	91	179	10	17	22	23,500
2-31	.62	I A	72	70	142	4	11	34	25,000
3-6	.52	I A	86	97	183	12	20	30	48,250
3-9	.96	I A	74	174	248	13	23	23	26,000
3-12	1.14	I A	175	188	363	21	36	30	47,500
3-16	.54	II A	68	96	164	10	21	31	38,500
3-17	1.11	I A	128	172	300	15	28	28	38,300
3-18	1.81	I A	209	261	470	22	44	30	32,900
3-18A	.88	I A	129	149	278	16	29	35	49,000
4-3A	1.00	I A	115	160	275	17	28	23	29,100
4-4A	.63	II A	81	80	161	7	25	27	28,200
4-5	1.13	I A	130	168	298	15	25	30	50,000
4-13	.59	II A	49	89	138	7	15	22	19,000
4-13A	.73	I A	61	96	157	11	20	26	35,300
4-14	1.29	I A	124	186	310	17	30	29	37,000
4-14A	.66	I A	55	94	149	11	21	26	27,000
5-35	.53	II A	27	77	104	4	13	26	11,250
6-26	1.93	I A	198	330	528	21	42	31	58,000
6-30	.75	I A	106	116	222	11	20	32	45,000
6-32	1.78	I A	205	313	518	24	48	30	38,500
6-34	.46	II A	33	59	92	5	12	21	14,300
7-19	.52	II A	50	69	119	8	15	23	28,300
7-23A	1.26	I A	129	214	343	14	32	30	46,000
8-16A	1.40	I A	162	202	364	20	34	34	55,200
9-1	1.51	I A	95	210	305	13	33	28	38,000

Table III

Structural Data Floodwater Retarding-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft.	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Ft.	Vol. of Fill Cu. Yds
9-25	1.13	I A	188	211	399	19	36	32	51,000
9-31	.48	I A	79	76	155	7	11	39	63,000
10-7	.63	II A	49	85	134	8	16	30	31,000
10-11	.70	II A	44	87	131	8	16	22	26,000
10-12B	.96	I A	98	169	267	12	25	32	40,000
10-15	.37	II A	57	55	112	9	14	26	16,600
11-23	1.30	I A	109	230	339	13	30	36	46,000
12-1	.53	II A	61	87	148	7	20	28	35,500
12-2	.48	II A	74	84	158	9	16	33	30,000
12-3	.78	I A	90	142	232	7	18	31	22,500
12-3A	.99	I A	139	200	339	17	35	25	21,000
12-33	1.04	I A	160	189	349	17	30	35	74,500
13-21	.73	I A	85	130	215	10	17	32	42,000
13-22	.43	II A	67	81	148	6	13	33	41,000
13-27B	1.23	I A	205	217	422	18	34	32	69,000
13-28	.59	I A	76	85	161	7	14	32	48,500
14-6	1.27	I A	195	203	398	20	48	29	41,000
14-7A	.56	II A	86	93	179	12	19	22	23,700
14-12	1.50	I A	252	282	534	30	54	30	53,000
14-18	2.34	I A	316	376	692	35	60	31	45,000
4-18A	.94	I A	126	150	276	14	28	30	61,500
14-20	1.94	I A	285	310	595	28	36	43	96,000
14-24	.95	I A	134	163	297	20	33	21	28,000
15-25	.41	II A	48	46	94	6	8	25	23,200
15-27	1.37	I A	193	190	283	27	37	30	50,000
15-28	.77	I A	126	129	255	22	32	23	34,500
15-30	5.9	I A	680	881	1561	80	150	45	132,000
16-23	.43	II A	75	72	147	12	19	19	24,000
17-16	.39	I B	66	81	147	8	16	26	22,000
17-20A	.43	II A	56	51	107	7	9	26	18,600

Table III

Structural Data Floodwater Retarding-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft.	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
17-20B	.43	II A	50	49	99	5	10	31	34,800
17-21	.51	II A	93	74	167	12	18	28	37,500
20-9	.50	I A	80	84	164	10	18	29	30,000
20-17MP	7.47	I B	4417	1858	6275	330	396	38	258,000
21-4	1.04	I A	176	186	362	15	30	33	60,500
21-9A	1.81	I A	255	319	574	18	45	42	81,500
21-14	.31	II A	53	53	106	7	14	25	36,000
21-14A	MP16.38	I A	2096	2621	4717	220	400	39	180,500
22-25	1.00	I A	141	176	317	15	23	35	39,000
22-36	1.20	I A	192	211	403	20	35	32	68,500
23-12A	.40	II A	46	45	91	6	11	28	19,400
23-27	1.02	I A	170	190	360	19	26	32	52,500
23-35	.94	I A	108	150	258	13	24	27	46,000
24-7 MP	9.55	I A	1284	1733	3017	180	255	31	110,000
24-13	.62	II A	71	96	167	12	21	27	26,500
24-19	1.6	I A	247	266	513	32	48	31	47,100
24-19A	.59	I A	99	101	200	10	17	33	33,700
24-20	.91	I A	104	135	239	17	29	24	27,200
24-30A	.75	I A	121	124	245	14	24	28	43,200
25-8	.57	I A	96	92	188	15	24	25	27,900
25-17	1.15	I A	192	197	389	23	43	29	45,100
25-18	.45	I A	80	89	169	12	21	24	28,000
25-20	.67	I A	111	103	214	14	24	32	77,200
25-29	.47	I A	81	81	162	10	18	27	44,200
26-3	1.00	I A	162	172	334	21	32	27	43,000
26-3A	.87	I A	146	149	295	13	22	30	46,600
26-10	1.43	I A	147	214	361	18	30	34	56,500
26-14	.61	I A	59	98	157	55	13	35	18,250
26-15	.94	I A	97	161	257	12	25	31	38,000
26-15A	.40	I B	66	59	125	8	13	28	45,500
26-23	1.00	I A	116	129	245	13	22	36	49,000

Table III

Structural Data Floodwater Retarding-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
26-23A	.56	I A	60	81	141	6	13	33	22,300
26-23B	.63	I A	88	84	172	10	18	28	37,000
26-33	.79	I A	142	134	276	18	30	19	20,000
27-6	.49	II A	50	73	123	8	15	25	18,750
27-9	1.00	I A	175	189	364	19	32	39	74,000
27-30	.94	I A	145	165	310	15	21	33	47,000
27-31A	.41	II A	53	61	114	6	8	32	41,500
28-4	1.44	I A	221	238	559	25	40	30	41,300
28-5A	.70	I A	89	104	193	13	20	34	59,000
28-9	.49	I B	76	110	186	13	21	23	39,000
28-10	.64	I A	98	106	204	12	26	31	40,000
28-10B	.99	I A	164	163	327	18	28	35	68,500
28-11	.50	II A	80	88	168	11	17	26	36,500
28-12	.40	II A	62	71	133	6	12	33	41,500
28-14B	.44	II A	73	73	146	7	13	37	31,000
28-31	.73	I A	117	132	249	20	23	27	47,500
28-32	1.85	I A	284	296	580	24	50	32	54,000
28-34	.85	I A	130	149	279	14	28	30	45,500
28-34A	1.37	I A	202	249	451	18	40	34	58,500
29-1	.41	II A	71	75	146	10	25	30	48,500
29-10	1.07	I A	179	178	357	24	36	29	51,000
29-10A	1.15	I A	192	221	413	24	41	30	50,500
29-15	.44	II A	73	80	153	14	20	22	19,000
29-15A	.52	I A	87	100	187	12	20	33	34,000
29-22	.58	I A	100	111	211	16	22	30	33,500
29-35	.84	I A	118	148	266	16	25	30	59,000
29-36	.46	II A	73	81	154	7	14	33	68,500
30-16	.56	I A	94	93	187	12	18	27	33,000
30-17	1.03	I A	171	181	352	18	35	24	37,000

Table III

Structural Data Floodwater Retarding-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft.	Sed. Pool Acres	Det. Pool Acres	Ht. of Dam Feet	Vol. of Fill Cu. Yds.
30-21	2.11	I A	351	383	734	35	70	37	68,500
30-30	.43	II A	72	79	151	10	22	21	27,500
31-2	.54	II A	90	98	188	18	24	21	12,000
31-3	1.23	I A	212	236	448	24	62	25	43,500
31-7	.87	I A	151	158	309	17	40	28	69,500
31-11	.43	II A	68	77	145	7	15	26	26,000
31-13	2.53	I A	405	445	850	45	60	33	73,000
31-19	.84	I A	145	107	252	16	25	33	57,000
31-25	11.03	I B	1552	2881	4433	150	280	44	98,300

* Grade Stabilization features will be considered and designed as a component of all dams to the utmost of feasibility.

Summary of

Multiple Purpose Structures (MP)

Str. No.	D.A. Sq. Mi.	Sed. Vol. Ac. Ft.	Recreat. Water Storage Ac. Ft.	Munic. Water Storage Ac. Ft.	Flood Det. Ac. Ft.	Total Vol.	Ht. of Dam
15-30	5.9	680	230	434	881	2225	45
20-17	7.47	702	2890	825	1858	6275	38
21-14A	16.38	2096	1076	1020	2621	6813	39
24-7	9.55	1284	416	780	1733	4213	31
31.25	11.03	1552	1392	936	2881	6761	44
TOTALS	50.3	6314	6004	3995	9974	26287	---

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft.	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
1-1	.55	I A	91	102	193	11	17	32	23,100
1-2	.48	I A	74	83	157	12	21	35	36,700
1-3	.53	II A	62	94	156	9	22	23	17,300
1-7	.38	II A	52.8	68	102.8	9	15	19	19,000
1-12	.68	I A	96	124	220	13	23	30	36,500
1-13	.57	I A	88	104	192	11	21	25	30,000
1-18	.23	II A	39	44	83	6	9	20	12,000
1-18B	.37	I A	60	60	120	7	14	28	28,500
1-19	.14	II A	18	20	38	2.5	4	23	9,800
1-21	.52	I A	53	86	139	10	17	26	27,500
1-22	.36	II A	53	61	114	8	13	27	21,500
1-23A	.64	I A	73	109	182	12	18	31	30,000
1-24	.22	II A	28	37	65	4	7	25	17,000
1-25	.20	II A	29	37	66	6	15	17	9,500
1-26	.23	II A	27	43	70	4	10	21	18,000
1-27	.23	II A	25	40	65	3	9	22	16,500
1-34	.45	II A	69	72	141	8	14	36	43,000
1-34A	.53	II A	61.4	85	146.4	7	14	29	28,500
1-35	.17	II A	10.9	28	38.9	2.5	8	21	11,500
2-15	.30	II A	25	46	71	5	10	21	18,500
2-16	.36	II A	42	61	103	8	22	25	16,000
2-21	.22	II A	22.9	37	59.9	3	9	25	23,500
2-22	.22	II A	32	30	64	3.5	6	24	33,700
2-27	.23	II A	20.8	39.5	60.3	4	17	22	21,000
2-28	1.35	I A	120.8	158.3	279.1	16	28	33	42,600
2-31A	.17	II A	8	15	23	2	5	19	7,500
2-33	.39	II A	55	71	126	7	14	32	35,000
3-1	.24	II A	38.8	48	86.8	6	14	26	36,000
3-1A	.32	II A	14	57	71	4	13	20	16,000
3-2	.30	II A	48.5	58	106.5	5	13	20	23,000

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
3.5	.50	I A	57	88	145	9	18	25	21,000
3-7	.20	II A	21	34	55	5	9	19	14,500
3-8	.47	I A	61	86	147	7.5	12.5	34	41,000
3-17A	.53	II A	87.7	95.5	183.2	9	18	29	24,000
3-19	.35	II A	54	61.9	115.9	6	10	22	20,000
4-2	.40	II A	52.2	66	118.2	9	18	25	25,000
4-3	.21	II A	24.3	36	60.3	0.5	10	18	12,500
4-4	.27	II A	37.4	42.5	79.9	6	10	21	15,000
4-4B	.39	II A	61.8	61.8	123.6	7	14	26	27,500
4-5A	.56	I A	79.2	93	172.2	9	19	33	44,000
4-9	.36	II A	55.2	46	101.2	7	12	26	18,500
4-9A	.20	II A	15.6	32.5	48.1	3	5	21	8,000
4-14B	.33	II A	48.3	56	104.3	8	13	21	19,500
4-15	.20	II A	13	27.5	40.5	2.5	6	17	11,000
4-24	.22	II A	32.2	39.7	71.9	4.5	9	22	7,000
5-1	.16	II A	12	18	30	4	8	20	13,750
5-7	.16	II A	12	21.7	33.7	2	7	20	7,000
5-36	.20	II A	10	26	36	3	5	22	7,000
5-36A	.27	II A	14	35	49	3	7	21	12,500
6-15	.43	II A	60.9	73.9	134.8	9	16	25	29,500
6-22	.33	II A	38	51	89	5	13	29	25,500
6-27	.14	II A	22	21	43	2.5	4	25	15,750
6-27A	.14	II A	24	25	49	3.3	6	20	15,000
6-28	.33	II A	51	47	98	6	11	30	32,250
6-29	.22	II A	11	27	38	3	6	17	6,250
6-33	.16	II A	8	15	23	1.5	4	21	8,000
6-34A	.34	II A	28	44	72	4	11	31	19,000
6-34B	.21	II A	17	24	41	4.5	10.5	18	7,500
6-35	.17	II A	10	23	33	2	5.5	25	16,300
6-35A	.25	II A	29	33	62	0.5	8.5	22	13,000

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac.Ft.	Det. Vol. Ac.Ft.	Total Vol. Ac.Ft.	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet.	Vol. of Fill Cu. Yds.
7-13	.36	II A	39	42	71	6	13	23	24,600
7-17	.22	II A	17	28	45	4	8.5	18	9,800
7-18	.30	II A	44	46	90	8	14	22	25,000
7-23	.51	II A	59	93	152	7	16	27	33,000
7-25	.22	II A	28	29	57	5	8	22	20,100
7-25A	.25	II A	24	35	59	5	8	19	10,600
7-29	.30	II A	19	35	54	4	7	18	12,900
7-30	.31	II A	37	49	86	7	13	26	27,800
8-8	.35	II A	27	46	73	5.5	12	22	17,300
8-8A	.34	II A	44	61	105	6.5	11	29	41,300
8-10	.25	II A	21	42	63	3.5	9	22	14,900
8-16	.25	II A	29	41	70	5	9	26	34,600
8-17	.25	II A	23	37	60	3.5	6	26	18,000
9-2	.33	II A	27.8	49.9	77.7	5	13	16	25,000
9-25A	.31	II A	24	40	64	5	9	24	16,500
9-29	.27	II A	39	47	86	6.5	11	21	18,100
9-30	.32	II A	45	52	97	9	11	16	16,800
9-31A	.18	II A	19	28	47	3	5	26	36,100
9-32	.31	I A	52	50	102	5	8	33	41,800
9-36	.28	II A	41	46	87	6	10	27	19,700
10-7A	.24	II A	40	36	76	5	8	27	28,700
10-12	.36	II A	34	51	85	4	11	27	27,000
10-12A	.18	II A	16	29	45	3	7	22	11,000
10-12C	.26	II A	22	39	61	5	10	21	10,000
10-14	.32	II A	53	54	107	7	11	26	21,500
10-14A	.31	II A	46	43	89	5.5	9	25	23,300
10-21	.36	II A	55	46	101	8	13	24	29,000
10-22	.22	II A	31	39	70	6	10	26	24,400
11-14	.50	II A	71	88.6	159	8	16	29	44,000
11-23A	.16	II A	8	20	28	2	3	21	5,000

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
11-25	.32	II A	16	38	54	4	7	21	9,900
11-25A	.25	II A	13	29	42	3	6.5	17	5,000
11-25B	.20	II A	13	24	37	2.5	4	19	7,400
11-30	.21	II A	25	23	48	3.5	5	24	9,200
11-30A	.16	II A	29	27.5	56.5	3	6	26	21,500
11-31	.17	II A	30	30	60	4	7	26	20,100
11-31B	.15	II A	28	27	55	4.5	8	20	13,500
11-32	.23	II A	14	31	45	2.5	6	25	14,000
11-32A	.16	II A	8	22	30	1.5	4	25	15,000
11-32B	.32	II A	28	28	56	5	8	18	10,500
12-11	.18	II A	12	24	36	2	4	26	16,000
12-13	.34	II A	17	48	65	3	6	29	23,500
12-24	.15	II A	10	21	31	2	4	25	7,000
12-35	.31	II A	44	62	106	4	11	33	32,000
12-35A	.23	II A	33	40	73	5.5	9.5	22	22,000
13-27	.25	II A	16	35	51	2.5	5	26	18,500
13-27A	.31	II A	40	47	87	5	10	29	28,000
13-34	.16	II A	18	28	46	3	7	20	10,000
14-7	.25	II A	35	42	77	6	12	18	18,500
14-8	.27	II A	38	44	82	6	11	15	8,500
14-16	.35	II A	59	65	124	10	15	26	33,000
14-17	.48	II A	65	80	145	6	18	29	35,000
14-17A	.41	II A	64	73	137	7	14	27	28,000
14-20A	.42	II A	56	67	123	7	14	26	25,500
14-24A	.46	II A	53	81	134	9	16	20	14,000
15-34	.39	II A	38	59	97	4	10	26	28,000
15-35	.39	II A	20	62	82	4	9	17	8,000
15-36	.28	II A	33	32	65	7	9	16	10,000
15-36A	.37	II B	57	46	103	7	12	26	28,700
16-13	.17	II A	28	24	52	6	9	22	17,000

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D. A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
16-13A	.33	II A	56	54	110	9	14	23	37,400
17-17	.46	II A	77	81	158	9	17	24	30,000
17-17A	.16	II A	28	25	53	3	5	29	22,500
17-18	.30	II A	27	49	76	4	10	29	32,000
17-20	.26	II A	31	31	62	10	14	21	7,250
17-20C	.24	II A	41	41	82	4.6	6.5	31	18,600
17-22	.30	II A	48	40	88	8	16	23	26,900
17-27	.17	II A	9	17	26	2.5	6	21	10,500
17-28	.25	II A	29	29	58	3.5	6	26	22,500
18-19	.26	II A	30	37	67	4	9	25	26,000
18-20	.18	II A	29	27	56	5	8	21	26,500
19-18	.18	II A	21	25	46	3.5	7	22	10,000
20-4	.48	II A	54	68	122	6.5	13	24	30,000
20-9A	.36	II A	37	48	85	6	10	25	17,000
20-10	.31	II A	57	50	107	11	17	23	20,000
20-16	.29	II A	50	50	100	6	10	30	36,000
20-16A	.26	II A	20	36	56	3.5	6	22	22,500
20-29	.28	II A	47	61	108	6	12	24	23,000
20-33	.33	II A	37	49	86	6	10	26	29,000
21-8	.67	I A	112	111	223	13	26	27	26,500
21-9	.38	II A	66	53	119	7	12	31	29,500
21-11	.19	II A	27	24	51	3.5	5.5	29	26,300
21-15	.35	II A	59	60	119	7	12	31	24,000
21-29	.18	II A	31	30	61	5	10	21	16,800
21-32	.33	II A	58	56	114	8	15	24	33,500
21-32A	.38	II A	63	65	128	10	16	20	23,000
22-6	.30	II A	46	38	84	4.5	7	29	23,100
22-6B	.26	II A	40	32	72	4.5	8	27	17,300
22-7	.18	II A	30	22	52	3.5	5	33	28,900
22-7A	.20	II A	21	22	43	4.5	7	21	13,900

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac. Ft.	Total Vol. Ac. Ft.	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds
22-8	.19	II A	35	33	68	4.5	6.5	28	22,000
22-19	.19	II A	35	27	62	5	6.5	28	36,000
23-1	.37	II A	55	49	104	6	10	29	31,900
23-2	.43	II A	74	57	131	16	21	25	39,300
23-12	.23	II A	14	23	37	3.5	7	19	19,500
23-34	.35	II A	45	47	92	7	13	25	42,500
24-5	.26	II A	47	44	91	5	8	26	15,300
24-6A	.19	II A	32	31	63	5	7	23	15,300
24-7A	.18	II A	;9	29	48	3	7	24	13,500
24-19B	.19	II A	34	32	66	5	8	20	11,400
24-24	.39	II A	65	64	129	10	15	22	23,500
24-29	.24	II A	36	43	79	4	10	24	22,500
24-30	.23	II A	41	40	81	3.7	6.2	24	18,600
24-31	.44	II A	45	70	115	7	13	23	19,500
25-18A	.28	II A	51	54	105	8	17	21	16,800
25-20A	.28	II A	32	48	80	6.5	12	20	11,400
25-21	.25	II A	43	45	88	7	11	21	16,000
25-28	.24	II A	37	35	72	5.5	10	29	20,200
25-33	.18	II A	29	25	54	4	8	23	15,800
26-8	.16	II A	30	26	56	4	7	18	19,000
26-9	.25	II A	47	45	92	6.5	10	25	32,400
26-10A	.20	II A	37	36	73	4	6.5	31	30,700
26-11	.22	II A	37	35	72	5	10	25	25,000
26-16	.23	II A	35	36	71	4	6	29	18,000
26-25	.25	II A	42	31	73	6	9	22	20,500
26-26	.18	II A	21	23	44	3	7	28	25,300
27-5	.16	II A	8	17	25	2	3	23	10,000
27-5A	.32	II A	41	44	85	5.5	9	30	32,500
27-8	.30	II A	55	42	97	8	12	26	31,300

Table III A

Structural Data Detention-Grade Stabilization Dams *

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Str. No.	D.A. Sq. Mi.	Hazard Class	Sed. Vol. Ac. Ft.	Det. Vol. Ac.Ft.	Total Vol. Ac. Ft.	Sed. Pool Acres	Det. Pool Acres	Ht of Dam Feet	Vol. of Fill Cu. Yds.
27-8A	.37	II A	67	51	118	5	14	32	36,000
27-9A	.19	II A	28	30	59	3	4	29	22,500
27-19	.61	I A	106	108	214	12	22	36	73,000
27-29	.38	I A	66	53	119	7	11	41	42,400
27-29A	.23	II A	35	31	66	6	7	24	13,200
27-31	.17	II A	13	23	36	2.5	5	22	6,500
27-33	.33	II A	54	49	103	8	11	21	22,600
28-2	.25	II A	36	41	77	2.5	8	31	26,500
28-3	.31	II A	50	57	107	6	11	27	29,000
28-10A	.23	II A	38	38	76	4	7	31	31,000
28-13	.33	I A	52	59	111	3.5	9	48	52,000
28-13A	.16	II A	22	25	47	3	5	29	20,000
28-13B	.18	II A	31	35	66	2	6	35	27,500
28-14	.29	II A	44	51	95	7.5	11	28	21,600
28-14A	.22	II A	36	42	78	4	5.5	30	25,000
28-33	.30	II A	35	48	83	5.5	10	21	18,000
30-21A	.26	II A	43	44	87	7	13	17	24,100
30-28A	.21	II A	37	38	75	6	9	31	42,000
30-29	.32	II A	50	58	108	8	11	21	23,500
31-23	.18	II A	30	34	64	6	9	17	25,500
31-24	.25	II A	42	46	88	6	10	28	20,000

* Grade Stabilization features will be considered and designed as a component of all dams to the utmost of feasibility.

Table IV

Monetary Benefits from Works of Improvement

Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Crop and Pasture Damage Reduction	$ 1,230,000	
Other Agricultural Damage Reduction	490,000	
Flood Plain Scour Reduction	50,000	
Road and Bridge Damage Reduction	38,000	
Indirect Benefits	35,000	
Secondary Benefits	80,000	
Siltation Reduction into Lower Delaware Valley and Perry Reservoir	65,650	
More Intensive Use of Land Resources	15,000	
Recreational, Environment Enhancement	27,000	
Municipal and Industrial Water Supply	250,000	$2,280,000
Benefits to Development of Kickapoo Indian Reservation. Supplement to Above Listings.		
Municipal and Industrial Water	$ 450,000	
Supplemental Irrigation	125,000	
Recreational, Environmental Enhancement	80,000	$ 656,000
Annual Benefits Total		$2,936,650

Table V

Summary of Physical Data

Nemaha-Brown Watershed Joint District No. 7, Kansas

Item	Unit	Quantity
Watershed District Area	Acres	173,110
Years to Complete Project	No.	20
Floodplain area Benefited	Acres	22,100
Upland area not responsive to Normal Treatment measures	Acres	4,475
Structural Measures		
Floodwater retarding-grade Stabilization Dams	No.	124
Detention-grade stabilization Dams	No.	197
Multipurpose structures	No.	5
Land Treatment grade dams	No.	160
Area Inundated by Reservoirs		
Sediment pools (permanent water)	Acres	3,838
Flood detention (flood expanded)	Acres	7,641
Multipurpose structures		
Sediment Pools	Acres	960
Flood detention pools	Acres	1,481
Storage Capacity of Structures		
Sediment pools	Acre Ft.	14,224
Flood Detention Pools	Acre Ft.	45.012
Multipurpose Structures		
Sediment Pools	Acre Ft.	10,029
Flood Detention	Acre Ft.	9,974
M. and I. and Recreation	Acre Ft.	20,003
Total Sediment and Flood Detention All Structures	Acre Ft.	99,242

Table VI

Areas Benefited

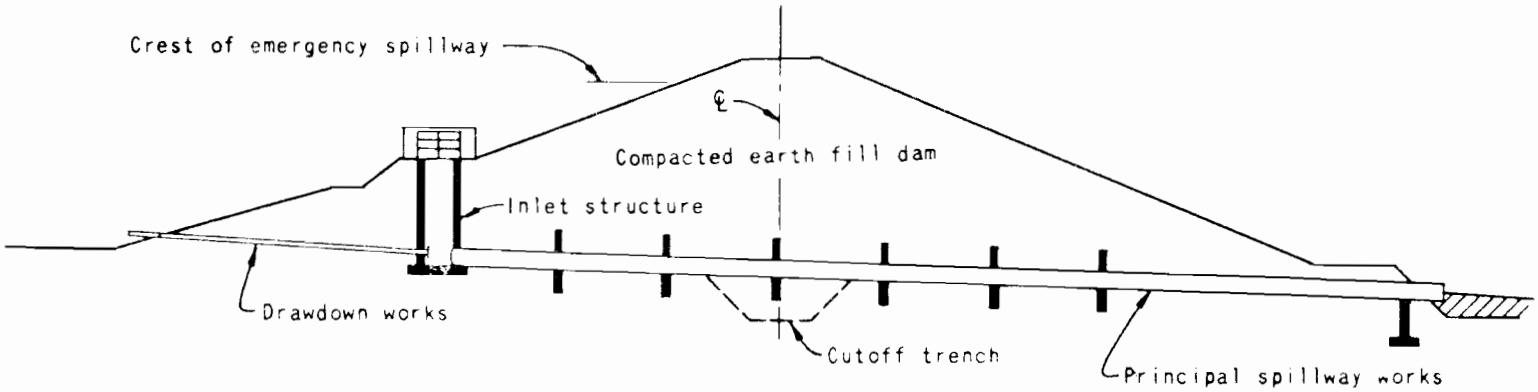
Upper Delaware and Tributaries

Nemaha-Brown Watershed Joint District No. 7, Kansas

Reach	Flood Plain Acres	Grade Stabilization Acres	Total
1-2-15 Lower Delaware River	4,610	2,582	7,192
3-4-11-12-13-14 Muddy Creek	5,040	7,421	12,461
5-6-7-8-9-10 Wolfley Creek	1,940	4,807	6,747
21-25 Plum Creek	1,220	1,844	3,064
16-17-22-28-30 Greg Creek	3,160	4,459	7,619
18-19-20 23-24 26-27 29-30-31 Upper Delaware River	6,140	10,135	16,275
Totals	22,110	31,248	53,358

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

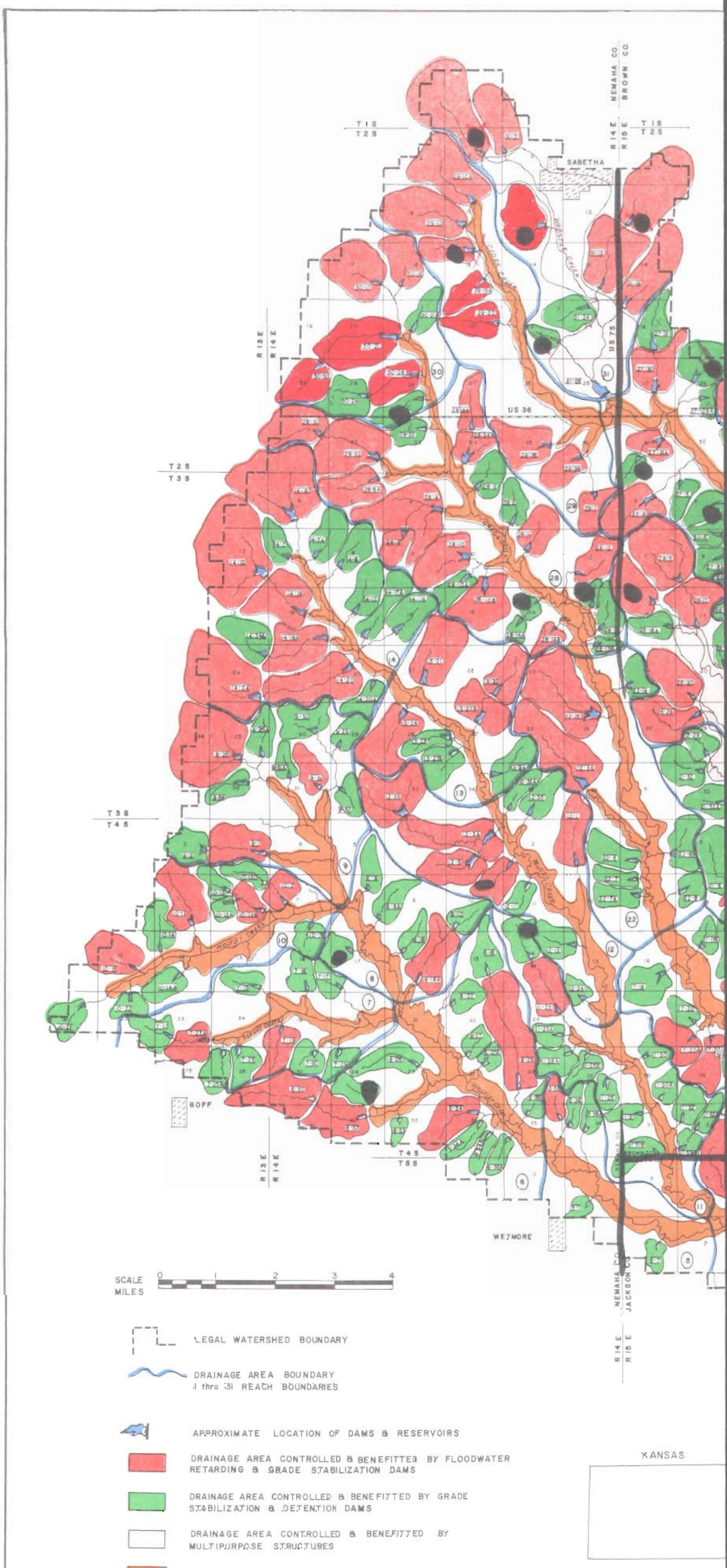
TYPICAL EARTH DAM WITH PIPE DROP INLET



CROSS SECTION OF DAM ON CENTERLINE OF PRINCIPAL SPILLWAY

NOTES:

1. FOR INDIVIDUAL STRUCTURE DATA SEE TABLE 3.
2. EMBANKMENT AND FOUNDATION DESIGN FEATURES NOT SHOWN.


T1S
T2S
R13E
R14E
R15E
NEMAHA CO
BROWN CO
SABETHA
US 75
US 36
T2S
T3S
T3S
T4S
T4S
T5S
GOFF
WETMORE
NEMAHA CO
JACKSON CO
SCALE
MILES
0
1
2
3
4
LEGAL WATERSHED BOUNDARY
DRAINAGE AREA BOUNDARY
1 thru 31 REACH BOUNDARIES
APPROXIMATE LOCATION OF DAMS & RESERVOIRS
DRAINAGE AREA CONTROLLED & BENEFITTED BY FLOODWATER RETARDING & GRADE STABILIZATION DAMS
DRAINAGE AREA CONTROLLED & BENEFITTED BY GRADE STABILIZATION & DETENTION DAMS
DRAINAGE AREA CONTROLLED & BENEFITTED BY MULTIPURPOSE STRUCTURES
AREA BENEFITTED
KANSAS

UPPER DELAWARE & TRIBUTARIES

NEMAHA — BROWN WATERSHED JOINT DISTRICT #7

ATCHISON, BROWN, JACKSON, & NEMAHA COUNTIES, KANSAS