

Approved: By acclamation  
Date 4-7-93

## MINUTES OF THE HOUSE COMMITTEE ON ENERGY AND NATURAL RESOURCES.

The meeting was called to order by Chairperson Carl Holmes at 3:30 p.m. on March 23, 1993 in Room 526-S of the Capitol.

All members were present except: Representative Lloyd, excused  
Representative Ruff, excused  
Representative Hendrix, excused  
Representative Webb, excused

Committee staff present: Dennis Hodgins, Legislative Research Department  
April Howell, Committee Secretary

Conferees appearing before the committee: Richard E. Koerth, Dept. of Wildlife and Parks  
Lawrence Brady, Kansas Geological Survey  
Charles Jones, KS Dept. of Health and Environment  
Wayland Anderson, Division of Water Resources  
Dennis Schwartz, Kansas Water Authority  
George Ham, KSU Agricultural Experiment Station

Others attending: See attached list

Chairman Holmes called the meeting to order and requested the Committee to review the minutes of March 22 for vote and approval at the conclusion of the briefing. The Chair opened the conclusion of the briefings on the Kansas State Water Plan.

Richard E. Koerth, Executive Manager of Dept. of Wildlife and Parks presented testimony, including a table which indicates projects associated with the State Water Plan. The list of projects includes those that have been requested by the Department, recommended by the Kansas Water Authority, or approved by the Legislature since FY 1991. The Secretary of Wildlife and Parks is an Ex-officio member of the Kansas Water Authority. In addition, employees of the Department attend all the basin committee meetings and area coordination team meetings. (Attachment 1)

Lawrence L. Brady, Associate Director for Research presented testimony on the Budget and Summary of Progress of the Dakota Aquifer Program During Kansas Water Plan Funding FY90-93. The Dakota aquifer program began in the state FY89 and is an eight-year-long multi-agency effort to assess the water-resources potential of the aquifer in order to meet the water-planning and regulatory needs of state and local agencies. (Attachment 2)

Charles Jones, Kansas Department of Health and Environment, provided for the Committee a folder including, but not limited to, an outline of the State Water Plan Fund and State Revolving Fund Concept. The concept definition of the program is to establish a State-sponsored Revolving Fund to provide low interest loans to qualified municipalities and small businesses for the remediation of soil, surface water, and groundwater contamination. (Attachment 3)

Wayland Anderson, Assistant Chief Engineer of the Division of Water Resources appeared and gave brief testimony on the State Water Plan. There was no written information, but he had previously supplied the Committee with information he would be speaking on. He summarized the allocations of State Water Plan Fund since FY90 explaining where the Division had utilized its funds.

Dennis Schwartz of the Kansas Water Authority appeared and gave a brief testimony on the State Water Plan. There was no written information supplied to the Committee. He stated that as a single member of the Water Authority he couldn't represent their statements, but he did present his interpretation and feelings regarding the expenditures from the State Water Plan Fund.

George E. Ham, Associate Director, KSU Agricultural Experiment Station, presented testimony on the Kansas Water Plan Projects. KSU has participated in one fund transfer and two projects associated with the State Water Plan. Water conservation is an important concept in the State Water Plan. In cooperation with the

## CONTINUATION SHEET

MINUTES OF THE HOUSE COMMITTEE ON ENERGY AND NATURAL RESOURCES, Room 526-S Statehouse, at 3:30 p.m. on March 23, 1993.

Kansas Water Office, KSU has initiated two water conservation projects utilizing state water plan funds. (Attachment 4)

The Chair opened the floor to questions of the Committee. Some questioning took place following each Conferee, but questions were now directed to all Conferees.

Representative Freeborn made a motion approving the minutes of March 22. Representative Shore seconded the motion. The motion carried.

The meeting adjourned at 5:15 p.m.  
No further committee meetings scheduled at this time.

Date: March 23 '93

## GUEST REGISTER

## HOUSE

## \* COMMITTEE ON ENERGY AND NATURAL RESOURCES \*

NAME	ORGANIZATION	ADDRESS	PHONE
Barbara Shirley	McGill Assoc.	Topeka	233-4512
Alan Steppat	Pete McGill + Assoc.	Topeka	233-4512
Kellynda Holmes		Topeka	
Jim + Charolyn Ramsey	- None -	Mulvane	-
Richard L. Jones	Ks Assoc. of Coun. Dist.	Salina	827-2547
Georg Ham	Kans. Ag. Exp. Sta. - KSU	Manhattan	532-6148
Sue Peterson	Kansas State University	Manhattan	
Terrie Kricho	Kansas Water Office	Topeka	296-0873
Jerry Quwall	"	"	296-0863
Stephen Hunt	"	"	3185
Dennis Schwartz	Ks Water Authority	Tecumseh	379-5553
Lola Warner	St. Conservation Comm.	Topeka	3600
Marty Burke	KDWSP	Topeka	3905
Larry Brody	Kansas Geological Survey	Lawrence	864-3965
Diane Giddard	Kansas Geological Survey	Lawrence	864-3965
Donald Whittemore	Kansas Geological Survey	Lawrence	864-3965
Wayland J. Anderson	Div. of Water Resources Kan. State Bd. of Ag.	Topeka	296-3718
Tom Sikes	KWO	Topeka	296-4094
Steve Adams	Wildlife & Parks	Topeka	296-2281
Dick Kuehl	DWP	Topeka	2281
Caliche Eieborn		Concordia	446-3645
DARRELL MONTEI	KDWP	PRATT	296-2281

STATE OF KANSAS



Joan Finney  
Governor

DEPARTMENT OF WILDLIFE & PARKS

Theodore D. Ensley  
Secretary

OFFICE OF THE SECRETARY

900 SW Jackson St., Suite 502 / Topeka, Kansas 66612 - 1233  
(913) 296-2281 / FAX (913) 296-6953

March 23, 1993

The Honorable Carl Holmes, Chairperson  
Committee on Energy and Natural Resources  
House of Representatives  
Room 526, State Capitol Building

Dear Representative Holmes:

Pursuant to a request from Legislative staff, the Department of Wildlife and Parks has prepared the attached table indicating projects associated with the State Water Plan. The list of projects includes those that have been requested by the Department, recommended by the Kansas Water Authority, or approved by the Legislature since FY 1991.

The list of projects includes Cheyenne Bottoms Renovation and Development of a State Park at Hillsdale State Park. These two projects have been included in the State Water Plan for a number of years.

The Department of Wildlife and Parks has been involved in the development of the State Water Plan and the annual recommendations to the Governor since the creation of the Department. The Secretary of Wildlife and Parks is an Ex-Officio member of the Kansas Water Authority. In addition, employees of the Department attend all basin committee meetings and area coordination team meetings.

I appreciate the opportunity to discuss the projects requested by the Department of Wildlife and Parks to be financed from the State Water Plan Fund. If you or members of the Committee have any questions, I am available at this time. Thank you.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard E. Koerth".

Richard E. Koerth  
Executive Manager

Attachment  
HENRH20

House E & NR  
Attachment 1  
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LISTING OF PROJECTS FINANCED FROM THE STATE WATER PLAN FUND  
(includes agency requests, KWA recommendations, and Legislative Approved)

22-Mar-93

Fiscal Year	DWP Requests	KWA Rec. Amount	Legislative Approved
<u>FY 1991</u>			
Cheyenne Bottoms Renovation	1,500,000	1,500,000	1,500,000
Hillsdale State Park Development	1,311,730	1,311,730	415,730
Geographic Information System	34,280	34,280	0
<u>FY 1992</u>			
Cheyenne Bottoms Renovation	1,000,000	1,000,000	1,000,000
Hillsdale State Park Development	1,000,000	1,000,000	0
Acquire Conservation Easements	150,000	0	0
River Access Program	150,000	150,000	0
Western Water Study for Recreation	200,000	200,000	0
<u>FY 1993</u>			
Cheyenne Bottoms Renovation	1,000,000	1,000,000	1,000,000
Hillsdale State Park Development	1,000,000	1,000,000	0
Acquire Conservation Easements	150,000	150,000	150,000
Neosho Madtom Research	0	0	15,000
Repair Dam at Crawford State Park	0	0	100,000
Riprap Shoreline at Cheney State Park	0	0	100,000

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<u>FY 1994</u>	DWP Request	KWA Rec.	Leg. Approved
Cheyenne Bottoms Renovation	1,000,000	1,000,000	820,000
Hillsdale State Park Development	1,000,000	1,000,000	0
Acquire Conservation Easements	150,000	150,000	0
Riprap Shoreline at Cheney State Park	175,000	0	175,000
Upper Arkansas River Access	50,000	0	0
River Recreation	90,270	90,270	0
Dam Repair and Maintenance	1,000,000	0	0
Land Acquisition for Flood Control - Cheyenne Bottoms WA	270,000	0	0

FY94BUDG\swpfund

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**BRIEFING DOCUMENT FOR THE KANSAS HOUSE ENERGY AND  
NATURAL RESOURCES COMMITTEE**

**ON**

**BUDGET AND SUMMARY OF PROGRESS OF THE DAKOTA  
AQUIFER PROGRAM DURING KANSAS WATER PLAN FUNDING  
FY90-93**

by the

**KANSAS GEOLOGICAL SURVEY**

Donald O. Whittemore, Coordinator - Dakota Project  
Diane H. Goddard, Associate Director for Administration  
Lawrence L. Brady, Associate Director for Research

March 23, 1993

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Attachment 2  
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## SUMMARY OF PROGRESS OF THE DAKOTA AQUIFER PROGRAM DURING KANSAS WATER PLAN FUNDING

Kansas Geological Survey  
March, 1993

The Dakota aquifer program began in state FY89 and is an eight-year-long multi-agency effort to assess the water-resources potential of the aquifer in order to meet the water-planning and regulatory needs of state and local agencies. In western Kansas localized depletion of near-surface sources of water coupled with the need to develop new water supplies is focusing the attention of planning and regulatory agencies on the next available source of water, the Dakota aquifer. However, uncertainties with respect to the quantity and quality of ground waters available, effects of withdrawals, and the potential impact of oil-brine disposal limits the ability of State agencies to evaluate the aquifer as a major water source for the future.

Work completed at the end of the Dakota program's first year (FY89) included data-base development, assessment of water use, a study of energy-use by high capacity wells, and initiation of research on stratigraphy, hydrogeology, and water-quality. Kansas Water Plan funding began in FY90. The overall objectives of the Dakota aquifer program during FY90-93 have been to (1) characterize subregionally the water-resources potential of the areas where the Dakota aquifer is shallowest and is undergoing development in central and southwestern Kansas in FY90-91, and (2) develop conceptual and functional models of ground-water flow and quality in FY92-93 for central and southwestern Kansas. Objectives for FY94-95 include (1) continuation of the conceptual and functional model development and application to assessment of water-planning and regulatory policies and (2) characterization of the water-resources potential of the west-central portion of the aquifer and extrapolation to northwest Kansas. We will use the final year of the program, FY96, to integrate the results, modify developed models and assessment applications based on reviews, determine the implications of the findings, and produce final synoptic reports and maps. The attached figure illustrates the subareas of investigation of the Dakota aquifer program. We have conducted the research with U.S. Geological Survey in cooperation with other state agencies involved in ground-water resources work.

Progress accomplished under the Water Plan funding can be generally grouped into three areas: (1) the geologic framework of the Dakota aquifer system, (2) the geohydrology (water quantity and flow properties related to the geologic framework), and (3) the geochemistry or water quality of the aquifer system. The Dakota aquifer is a system of interbedded lenses of sandstone and mudstones underlying most of the western two-thirds of Kansas. The geologic framework is extremely variable in composition because of the nature of the geologic processes that were responsible for deposition of the sediments that formed the rocks. To address the problem of aquifer variability, research has included subdividing the aquifer at the regional and subregional level into (1) aquifer units which allow the movement of ground water and are the primary water sources for wells, and (2) aquitards which impede the movement of ground water.

We have had considerable success in applying borehole geophysical and sequence-stratigraphic methods to the Dakota aquifer framework for classification into aquifer and non-aquifer units. This research effort has fostered a better understanding of regional ground-water flow patterns, which are an important constraint on the quantity and quality of ground water available to wells. The geologic and geophysical databases have been used to interpret the ancient depositional environments and paleogeography that produced the observed arrangement of aquifer and aquitard units in the Dakota aquifer. This has made possible delineation of the major sandstone aquifer trends and a limited ability to predict sandstone aquifer occurrence in areas of sparse data. We are using this information to predict hydrologic characteristics of the aquifer based on sandstone body trends and distribution.

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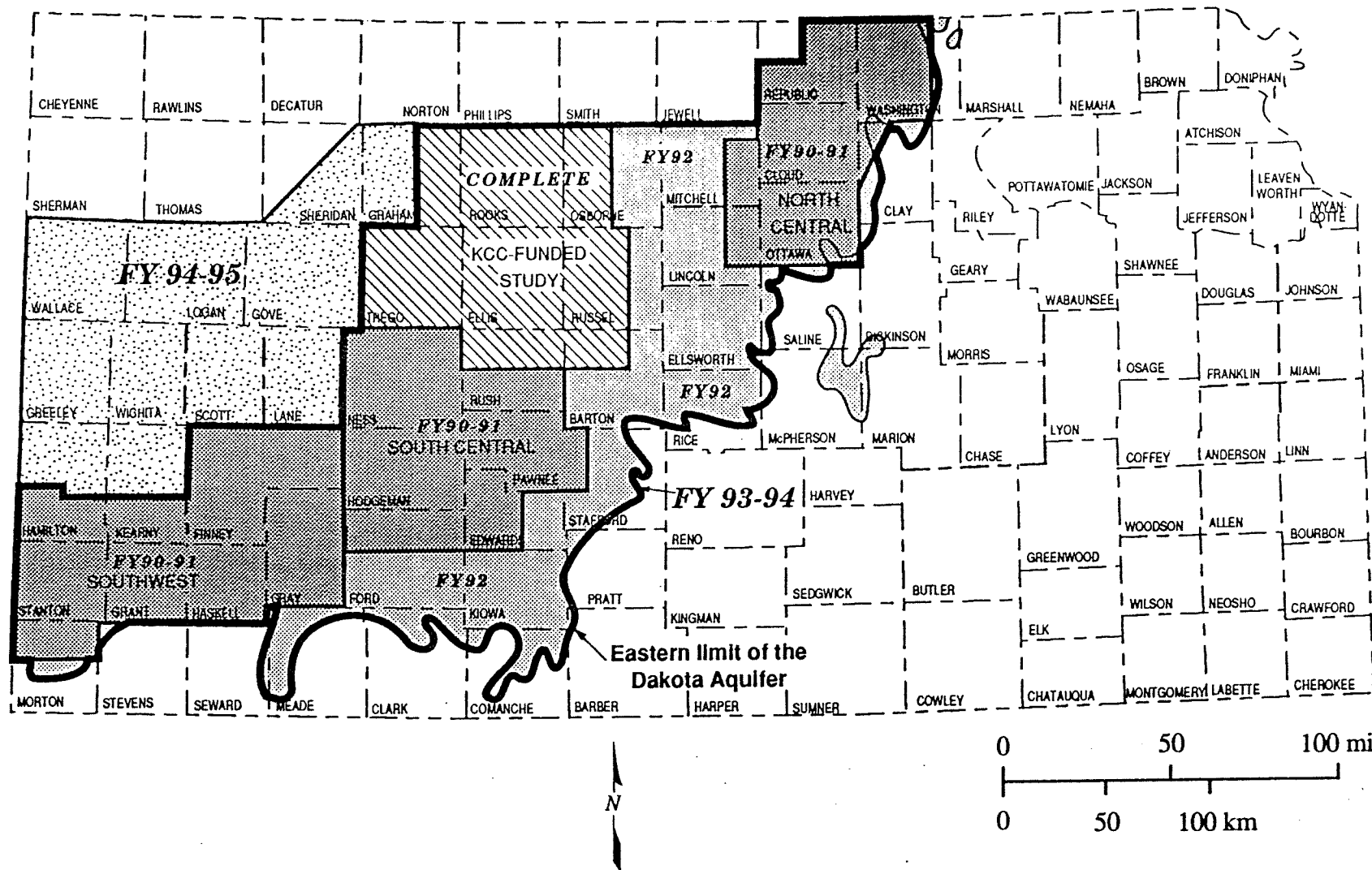
Program research has also concentrated on developing a better understanding of the overall ground-water flow system, including the hydraulic connection of the Dakota aquifer to other aquifer systems and those factors that affect water quality. The research has included both field measurements, such as water levels and pumping tests, and computer simulations. The computer models range in size from smaller scale areas in parts of the Kansas-lower Republican River and Solomon River basins in north-central Kansas, to a regional simulation for southwestern Kansas, to a large-scale model across the southern half of the aquifer, and a cross section model from southeastern Colorado to central Kansas.

We have established that most of the ground-water flow in the Dakota aquifer that flows into central Kansas originates from areas of southeastern Colorado and southwestern Kansas. Once in the aquifer, recharge moves toward discharge areas in central Kansas at rates of movement that are relatively much slower than the rate of movement in the Ogallala or in stream-aquifer systems. For most of the Kansas and southeastern Colorado portions of the aquifer, the Dakota is confined by overlying strata of much lower permeability and receives limited recharge from the surface where fracture pathways permit downward movement of water from the High Plains aquifer (Ogallala and associated alluvial aquifers), stream-aquifer systems, or precipitation. We believe that the Dakota and High Plains aquifers behave largely as a single system, given long enough time, in southwestern Kansas where they are in contact. This implies that development of water resources in one aquifer should eventually impact on the other. However, in the confined areas of the Dakota aquifer, geochemical age determinations and computer models of flow rates indicate that the Dakota waters are well over 10,000 years old, meaning that the present recharge rate in these areas is very small in comparison with current or future pumping withdrawal.

In central Kansas we have found that sources of saltwater in the lower part of the Dakota aquifer and in underlying strata move slowly upward and laterally toward shallower freshwater aquifers and surface waters. Saltwater from the Dakota aquifer substantially impairs the water quality of streams in several areas of central Kansas. Within the Dakota aquifer, we have found that, in general, ground-water chemistry reflects the composition of the aquifer framework and the effects of recharge from different sources and intrusion of natural saltwater from below. We have assessed the quality of waters for various uses on the basis of their chemical content and drinking-water and agricultural standards. Analytical determinations include not only inorganic and radiochemical constituents for which drinking-water standards exist, but also constituents for which maximum contaminant levels have been proposed by the federal government, such as additional trace metals and dissolved radon.

The main quality problem in the aquifer is high dissolved-solids concentrations, and thus, sodium and chloride and/or hardness and sulfate contents in many areas. Other quality characteristics include high, natural fluoride contents in much of the confined aquifer regions and large nitrate concentrations that appear to be related to older water-well construction practices. We have examined saline waters in the aquifer using chemical fingerprinting to determine where oil brine has impacted water quality. The results indicate only little contamination of the aquifer from oil-field brine. For example, analyses of salinity sources in the test and new production wells drilled by the cities of Hays and Russell show no identifiable presence of oil brine, even though many of the wells are in oil fields.

Communication of results from the Dakota aquifer program have included (1) reports and maps, (2) presentations to the Water Authority, different state agencies, local units of government, and scientific meetings, and (3) replies to requests for information from different agencies, industries, and the public. Maps developed or in the process of development include surfaces and thicknesses of geologic units in the Dakota aquifer and adjacent rock units, cross sections of the hydrogeology, and distribution of water quality parameters for the aquifer.



Extent of the Dakota aquifer in Kansas and subareas of investigation.

House E&R

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# WATER PLAN - DAKOTA FUNDS

	1993 projected	1992 actual	1991 actual	1990 actual
PERSONNEL				
Students	\$64,273	\$53,891	\$42,420	\$50,309
Unclassified - temporary	\$12,315	\$17,035	\$13,627	\$8,732
Fringe Benefits	\$5,084	\$5,471	\$2,909	\$2,607
TOTAL PERSONNEL	\$81,672	\$76,397	\$58,956	\$61,648
USGS	\$62,160	\$60,700	\$62,425	\$60,700
TRAVEL	\$6,100	\$6,334	\$5,233	\$10,177
SUPPLIES				
Office supplies	\$863		\$468	\$228
Field supplies	\$5,182	\$3,552	\$5,015	\$3,669
Scientific supplies	\$6,250	\$12,214		
TOTAL SUPPLIES	\$12,295	\$15,766	\$5,483	\$3,897
DRILLING			\$18,275	
SERVICES				
land use	\$1,000	\$1,000	\$1,000	
logging		\$3,402	\$4,002	\$15,302
digitizing		\$640	\$1,320	\$6,504
printing	\$2,000	\$980	\$3,600	\$1,480
miscellaneous	\$500	\$204	\$465	
repair		\$1,145		
Geostat study - Geography Dept	\$5,000			
TOTAL SERVICES	\$8,500	\$7,371	\$10,387	\$23,286
EQUIPMENT				
field equipment	\$9,000		\$12,369	\$10,200
computer equipment	\$14,240	\$27,502	\$7,890	\$17,792
software	\$4,183	\$4,080	\$14,879	\$12,300
analytical equipment	\$1,850	\$1,850	\$4,103	
TOTAL EQUIPMENT	\$29,273	\$33,432	\$39,241	\$40,292
TOTAL	\$200,000	\$200,000	\$200,000	\$200,000

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DAKOTA AQUIFER PROJECT -- PERSONNEL/PAYROLL SUMMARY -- FY 90 THRU FY 93

3/22/93

FISCAL YEAR	ACCOUNT NUMBER	PAYROLL CATEGORY	NUM POS	NUM EMPLS	TOTAL COST	
FY 93 (PROJECTED)	2951-20-0532	UNCLASSIFIED-TEMPORARY	1	1	\$12,315	
		CLASSIFIED	0	0	\$0	
		STUDENT	8	8	\$64,273	
		FRINGE	9	9	\$5,084	
						\$81,672 TOTAL
FY 92	2951-20-0532	UNCLASSIFIED-TEMPORARY	1	1	\$17,035	
		CLASSIFIED	0	0	\$0	
		STUDENT	7	7	\$53,891	
		FRINGE	8	8	\$5,471	
						\$76,397 TOTAL
FY 91	2951-20-0532	UNCLASSIFIED-TEMPORARY	1	1	\$13,627	
		CLASSIFIED	0	0	\$0	
		STUDENT	6	7	\$42,420	
		FRINGE	7	8	\$2,909	
						\$58,956 TOTAL
FY 90	2951-20-0044	UNCLASSIFIED-TEMPORARY	1	1	\$8,732	
		CLASSIFIED	0	0	\$0	
		STUDENT	11	11	\$50,309	
		FRINGE	12	12	\$2,607	
						\$61,648 TOTAL

HOUSE E&NR

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STATE WATER PLAN FUND  
State Revolving Fund Concept  
March 15, 1993

Concept Definition:

Establish a State sponsored Revolving Fund to provide low interest loans to qualified municipalities and small businesses for the remediation of soil, surface water, and groundwater contamination.

Background:

Since the 1970's a heightened awareness of environmental issues has stimulated the American public and government to take measures to protect the environment. The backlash of public concern over the ever broadening list of contaminated sites has created a plethora of new environmental regulations. Toxicological studies have identified chemicals which have been in use for years but are now known to cause health and environmental problems.

Federal and State legislation has forced municipalities and businesses to examine current and past storage, use and disposal practices for many substances which have been identified as being hazardous to health or the environment. Often the municipalities and small businesses are unable to bear the financial burden necessary to perform the required investigations and clean-up.

Many Kansas municipalities and small businesses identified as being potentially responsible parties at contaminated sites simply do not have the capital to finance investigations and subsequent remediation. In most cases, loans are not available through financial institutions as the risk is considered too great. In some cases the State has assumed responsibility for investigation and remediation. In other cases the State has mandated a clean-up, and the responsible party has gone into bankruptcy, once again leaving the burden of investigation and remediation upon the State. The current scenario is clearly a lose-lose situation for the State and it's citizens.

Financial assistance for municipalities and small businesses has traditionally been made available for large capital expenditures which are mandated and address concern for public safety, health and economic development. An example of this assistance is the Kansas Water Pollution Control Revolving Fund which was established to provide communities with financial assistance for the construction of wastewater treatment facilities.

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### Recommendations:

The ultimate goal of the State is to identify permanent solutions to the environmental problems in Kansas. This goal is essential for public health, environment, safety, and economic development in the State.

KDHE/BER recommends the implementation of a State Revolving Fund to assist with environmental investigation and remediation projects for qualifying organizations. The initial capital necessary to drive such a fund could be derived from any combination of State General Funds, State Water Plan Funds, of Economic Development Funds. An initial capital allocation of three million dollars, with an additional three million dollars per year for a minimum of four years would be necessary to finance the plan.

### Legislative Implications:

Legislation would be required to establish the fund. A combination of State funds, State Water Plan Funds and Economic Development Funds should be considered. The legislation must also address the conditions of the loan and the repayment agreements.

### Fiscal Impact

Interest on each one million dollars loaned at 4.2% for fifteen years will generate \$349,550.86. (The dollar amounts, interest rate, and term are for illustrative purposes only.)

## KANSAS WATER PLAN PROJECTS

Kansas State University  
Agricultural Experiment Station  
Cooperative Extension Service

Testimony prepared by  
George E. Ham  
Associate Director, Agricultural Experiment Station

### Introduction

Kansas State University has participated in one fund transfer and two projects associated with the State Water Plan.

In the 1990 session, the legislature lapsed \$100,000 in general fund appropriations from the experiment stations account and directed the transfer of \$100,000 from the state Water Plan Fund to the agricultural experiment stations water programs fund of Kansas state university (1990 Session Laws of Kansas, p. 273). This reduced expenditures from state general funds for the operational activities of the agricultural experiment Station on a one time basis. This transfer was initiated by legislative action and was not requested by Kansas State University.

### Water Conservation

Water conservation is an important concept in the State Water Plan. In cooperation with the Kansas Water Office, Kansas State University has initiated two water conservation projects utilizing state water plan funds.

#### Irrigation Water Conservation

The Irrigation Water Conservation Program is designed to help irrigators reduce their irrigation water application through on-site visits and educational programs. This project, initiated in July, 1992, is progressing well. Computer software is being developed to help irrigators adopt the management power, water-use efficiency, and economic advantage of superior site-specific water management techniques. For easy computation, a main frame computer program is being adapted for use on a personal computer in an interactive mode.

Water conservation techniques will be transmitted to irrigators through an intensified education program. The emphasis is on water measurement as a management tool, crop water requirements, irrigation scheduling, pumping plant efficiency, and irrigation system efficiency.

Since drainage is an important component of the software program, the model will be calibrated at irrigated sites at Colby and Garden City. This effort represents the first year of a planned five-year

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program of model development, data collection, and intensified water conservation education.

Fiscal year 1993 project expenditures will total \$50,000 and are projected to grow to \$350,000 over the five-year life of the project.

### **Zero Depletion**

Kansas State University also initiated a two-year study of the Economic impact of Zero Depletion in Northwest Kansas.

Zero depletion of the aquifer would conserve significant quantities of water but would also impact the economic, environmental, and social structure of the area.

The study will estimate the effect of irrigated agriculture on the economy of northwest Kansas, compare the regional effect of alternative groundwater use policies through time on crop production, farm income, land values, agribusiness income, employment and population, the feedlot industry, water use and saturated thickness.

The linear programming model to be used in the analysis of the impact of zero depletion has been developed and tested. Price, production costs, crop yields per acre, irrigation efficiency, and technology projection estimates are underway. The farm level research on the impact of zero depletion policy will be conducted as soon as the groupings of irrigators and projected future prices, costs, and technological changes have been made.

Fiscal year 1993 expenditures will total \$47,000 and are projected to grow to \$94,000 over the two-year life of the project.

I would be pleased to respond to questions.

House E & NR  
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