

MEMO



DATE: August 14th, 2017
TO: Kansas Water Authority
FROM: Karma Mason and Katie Mitchell
RE: KWA Budget Committee

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The Kansas Water Authority Budget Committee had a conference call on July 12th, 2017. Primary topics of the call included:

1. State Water Plan Fund FY2017 Actuals, FY2018 Appropriated and FY2019 Appropriated
2. Additional \$1.2 Million SGF Transfer for FY2018 – (Streambank Stabilization, KS River Alluvial Aquifer, Bathymetry)
3. SGF Transfer and EDIF Fund Transfer – FY2019

Karma Mason (chair), Gary Harshberger, Brad Loveless and Mark Fischer were present on the call along with the agency representatives.

The Committee consensus was to affirm the target funding is for the Vision Implementation Priority Projects. The Committee requested that the agencies provide Vision Priority Projects for the \$8 million SGF/EDIF transfer and an additional \$8 million for Vision Implementation Projects.

The KWA Budget Committee had a discussion about the Kansas Water Authority continuing the implementation of Projects with in the Vision and the Blue Ribbon Task Force Report. The Kansas Water Authority Budget Committee tasked the Kansas Water Office, in coordination with other agencies, with the goal of updating the Project Sheets with details to be included along with the State Water Plan Fund Spreadsheet. The KWA Budget Committee believes the Project Sheets are a useful tool during the legislative session. The Kansas Water Office along with the other agencies will provide a comprehensive program analysis including program objectives, proposed activities, additional funding sources and consequences of not funding. Included in the detail would be RAC action plans, success stories and best management practice. The Project sheets will be presented at the October KWA Meeting. If members of the KWA believe other information would be helpful in deciding prioritization of projects or for the members to better understand the proposal, those suggestions should be passed along to the Kansas Water Office.

The Kansas Water Authority Budget Committee had a conference call on August 14th, 2017. Primary topics of the call included:

1. State Water Plan Fund FY2017 Actuals, FY2018 Appropriated and FY2019 Appropriated
2. Review of \$1.2 Million Legislative Appropriation
3. Priority Project Request by Agencies – Attachment A and Attachment B

Karma Mason (chair), Gary Harshberger, Brad Loveless, Randy Hayzlett and Mark Fischer were present on the call along with the agency representatives.

The Kansas Water Authority Budget Committee had a lengthy discussion on the priority projects that were presented to the committee. The KWA Budget Committee is recommending budgeting FY2019 expenditures associated with requests to reinstate the statutory SGF and EDIF transfers. The Committee consensus was to focus the funding on highest priority projects and the key to maintaining credibility by implementing the Vision process and continue to listen to the Regional Advisory Committee Goals. The committee recommended \$7,495,000 of projects that can be found on Attachment C with a description on Attachment D. The committee adjourned until Wednesday, August 16th, 2017 at the conclusion of the KWA tour to finalize the recommended Vision Implementation priority projects to the full Authority.

State Water Plan Fund

Agency/Program	FY2017 Actuals	FY2017 Carry forward	FY2018 Appropriated	FY2018 w/Carry Forward	FY2018 Enhancement	FY2019 Appropriated
Department of Health and Environment						
Contamination Remediation-1802	\$ 654,095	\$ 34,206	\$ 602,824	\$ 637,030	\$ -	\$ 688,301
TMDL Initiatives-1805	\$ 244,057	\$ 34,250	\$ 216,114	\$ 250,364	\$ -	\$ 276,307
Nonpoint Source Program-1804	\$ 297,768	\$ 7,000	\$ 238,540	\$ 245,540	\$ -	\$ 298,980
Watershed Restoration and Protection Strategy	\$ 555,884	\$ -	\$ 555,000	\$ 555,000	\$ -	\$ 555,884
Total--Department of Health and Environment	\$ 1,751,804	\$ 75,455	\$ 1,612,478	\$ 1,687,933	\$ -	\$ 1,819,472
University of Kansas--Geological Survey	\$ 26,841	\$ -	\$ 26,841	\$ 26,841	\$ -	\$ 26,841
Department of Agriculture						
Interstate Water Issues-0070	\$ 451,841	\$ 37,884	\$ 387,413	\$ 425,297	\$ -	\$ 487,000
Subbasin Water Resources Management-80	\$ 780,713	\$ 132,688	\$ 407,149	\$ 539,837	\$ -	\$ 610,808
Water Use-75	\$ 107,488	\$ 55,810	\$ 64,368	\$ 120,178	\$ -	\$ 72,600
Water Resources Cost Share-1205	\$ 2,041,643	\$ 81,023	\$ 1,727,387	\$ 1,808,410	\$ -	\$ 1,948,289
Nonpoint Source Pollution Asst.-1210	\$ 1,866,556	\$ 128,109	\$ 1,502,909	\$ 1,631,018	\$ -	\$ 1,858,350
Aid to Conservation Districts-1220	\$ 2,092,637	\$ -	\$ 2,000,000	\$ 2,000,000	\$ -	\$ 2,092,637
Watershed Dam Construction-1240	\$ 559,353	\$ 17,081	\$ 511,076	\$ 528,157	\$ -	\$ 550,000
Water Quality Buffer Initiative-1250	\$ 179,893	\$ 177,008	\$ 88,662	\$ 265,670	\$ -	\$ 200,000
Riparian and Wetland Program-1260	\$ 158,892	\$ 203	\$ 135,343	\$ 135,546	\$ 281,312	\$ 152,651
Water Supply Restoration Program-1275	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Water Transition Assistance Program/CREP	\$ 178,572	\$ 71,114	\$ 177,141	\$ 248,255	\$ -	\$ 200,000
	\$ 8,417,588	\$ 700,920	\$ 7,001,448	\$ 7,702,368	\$ 281,312	\$ 8,172,335
Kansas Water Office						
Assessment and Evaluation	\$ 545,732	\$ 94,023	\$ 500,000	\$ 594,023	\$ -	\$ 450,000
GIS Database Development	\$ 112,306	\$ -	\$ 50,000	\$ 50,000	\$ -	\$ -
MOU - Storage Operations & Maintenance	\$ 302,066	\$ -	\$ 363,699	\$ 363,699	\$ -	\$ 350,000
Stream Gaging	\$ 431,282	\$ -	\$ 350,000	\$ 350,000	\$ -	\$ 431,282
Technical Assistance to Water Users	\$ 377,646	\$ 96,479	\$ 325,000	\$ 421,479	\$ -	\$ 325,000
Kansas Alluvial			\$ 100,000	\$ 100,000	\$ -	\$ -
Bathymetric Study			\$ 100,000	\$ 100,000	\$ -	\$ -
Streambank Stabilization	\$ 400,000	\$ -	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -
Total--Kansas Water Office	\$ 2,169,032	\$ 190,502	\$ 2,788,699	\$ 2,979,201	\$ -	\$ 1,556,282
Total State Water Plan Expenditures	\$ 12,365,265	\$ 966,877	\$ 11,429,466	\$ 12,396,343	\$ 281,312	\$ 11,574,930
State Water Plan Resource Estimate	FY2017 Actual	FY2017 w/Carry Forward	FY2018 Appropriated	FY2018 w/Carry Forward	FY2018 Enhancement	FY2019 Appropriated
Beginning Balance	\$ 582,946		\$ 718,841	\$ 718,841	\$ 718,841	\$ (504,151)
Adjustments						
Division of Budget- released PY Enc. Not recorded	\$ 702,377					
Release of Prior Year Encumbrance	\$ 549,091					
Reduced Resources						
Other Service Charges	\$ 28,255		\$ 28,255	\$ 28,255	\$ 28,255	\$ 28,255
Transfers to SGF - John Redmond Bond	\$ (916,550)		\$ (1,260,426)	\$ (1,260,426)	\$ (1,260,426)	\$ (1,260,426)
Subtotal--Adjustments	\$ 363,174	\$ -	\$ (1,232,171)	\$ (1,232,171)	\$ (1,232,171)	\$ (1,232,171)
Revenues						
State General Fund Transfer	\$ -		\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ -
Economic Development Fund Transfer	\$ -		\$ -	\$ -	\$ -	\$ -
Municipal Water Fees	\$ 3,028,509		\$ 2,838,217	\$ 2,838,217	\$ 2,838,217	\$ 3,267,271
Clean Drinking Water Fee Fund	\$ 2,724,051		\$ 2,539,046	\$ 2,539,046	\$ 2,539,046	\$ 2,820,674
Industrial Water Fees	\$ 973,133		\$ 934,928	\$ 934,928	\$ 934,928	\$ 1,120,701
Stock Water Fees	\$ 387,655		\$ 415,975	\$ 415,975	\$ 415,975	\$ 464,256
Pesticide Registration Fees	\$ 1,359,410		\$ 1,334,523	\$ 1,334,523	\$ 1,334,523	\$ 1,334,523
Fertilizer Registration Fees	\$ 3,491,049		\$ 3,224,145	\$ 3,224,145	\$ 3,224,145	\$ 3,568,921
Pollution Fines and Penalties	\$ 152,205		\$ 155,000	\$ 155,000	\$ 155,000	\$ 165,000
Sand Royalties	\$ 21,975		\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000
Total Receipts	\$ 12,137,986	\$ -	\$ 12,686,834	\$ 12,686,834	\$ 12,686,834	\$ 12,786,346
Total Available	\$ 13,084,106	\$ -	\$ 12,173,504	\$ 12,173,504	\$ 12,173,504	\$ 11,050,024
Less: Expenditures	\$ 12,365,265	\$ -	\$ 11,429,466	\$ 12,396,343	\$ 12,677,655	\$ 11,574,930
Ending Balance	\$ 718,841	\$ -	\$ 744,038	\$ (222,839)	\$ (504,151)	\$ (524,906)

Attachment A

State Water Plan Fund requested Priority Projects by Agency presented to
KWA Budget Committee Conference Call: Monday August 14th, 2017

Kansas Department of Helath and Environment		
Watershed Restoration and Protection Strategy (increase)	\$ 244,000	BMP
Harmful Algae Bloom Pilot	\$ 500,000	*
Nutrient Reduction	\$ 1,500,000	BMP
Drinking Water Protection	\$ 750,000	
Contamination Remediation	\$ 400,000	*
Nonpoint Source Program	\$ 30,000	BMP
TMDL	\$ 25,000	
	<u>\$ 3,449,000</u>	
Kansas Geological Survey		
Aquifer Modeling Maintenance Project (AMMP)	\$ 150,000	
Long-term Operation of the Kansas River Index Well Network	\$ 25,000	
	<u>\$ 175,000</u>	
Kansas Department of Agriculture		
Telemetry	\$ 845,000	*
Feed Wheat and Other Alternative, Less Water-Intensive Forages	\$ 225,000	
Water Right Transition Assistance Program (WTAP)	\$ 1,000,000	
Conservation Reserve Enhancement Program (CREP)	\$ 1,800,000	
Interstate Water Compact Compliance	\$ 100,000	
Water Structures Inspections	\$ 200,000	
Kansas Sediment and Nutrient Reduction Program	\$ 3,750,000	BMP
State Aid to Conservation Districts	\$ 410,912	BMP
Conservation District Technical Contribution Agreement	\$ 200,000	BMP
Watershed Dam Construction	\$ 1,894,490	
	<u>\$ 10,425,402</u>	
Kansas Water Office		
Irrigation Technology	\$ 1,000,000	*
Streambank Stabilization - based on SB team recommendation	\$ 1,000,000	*
Groundwater Model of the Kansas River Alluvial Aquifer	\$ 100,000	Vision Imp Rsch
Bathymetry and Sediment Monitoring	\$ 100,000	Vision Imp Rsch
In Lake Algae Bloom Activities	\$ 500,000	
Milford Lake RCPP Match	\$ 400,000	BMP
Kansas Basin Watershed Management System	\$ 250,000	BMP
Vision Education Strategy	\$ 500,000	*
Chloride Plume Project	\$ 500,000	*
Water Technology Farms	\$ 250,000	*
MPSL Siting Evaluation / PL566 Rehab Siting	\$ 100,000	
Waters Leaving the State Evaluation	\$ 200,000	
	<u>\$ 4,900,000</u>	
Kansas Biological Survey		
Evaluating the Effectiveness of Streambank Stabilization in Reducing Sediment Yields	\$ 300,000	Vision Imp Rsch
Reservoir Water Quality: Harmful Algal Blooms (HABs)	\$ 100,000	Vision Imp Rsch
Reservoir Bathymetric Surveys and Biological Research	\$ 100,000	Vision Imp Rsch
	<u>\$ 500,000</u>	
<i>Additional Requested Priority Projects beyond the \$8 million request</i>		
Education and Outreach	\$ 1,000,000	
Data and Research	\$ 1,000,000	
Technical Assistance and Administration	\$ 2,000,000	
Reservoir Implementation Activities	\$ 6,000,000	
Ogallala Implementation Activities	\$ 3,000,000	
Water Quality Protection and Restoration Projects	\$ 3,000,000	
	<u>\$ 16,000,000</u>	
Kansas Department of Health and Environment		
Watershed Restoration and Protection Strategy (increase)	\$ 244,000	BMP
Harmful Algae Bloom Pilot	\$ 750,000	
Nutrient Reduction	\$ 2,500,000	BMP
Drinking Water Protection	\$ 1,500,000	
Contamination Remediation	\$ 900,000	
Nonpoint Source Program	\$ 60,000	BMP
TMDL	\$ 25,000	
	<u>\$ 5,979,000</u>	

Attachment B: Description

State Water Plan Fund requested Priority Projects by Agency presented to
KWA Budget Committee Conference Call: Monday August 14th, 2017

Department of Health and Environment

Contamination Remediation – Orphan Site Program - \$400,000 or \$900,000

This program uses these funds to address environmental contamination that have impacted soils, sediments, surface water and groundwater at orphaned sites. There are 53 orphan sites that are in need of a significant environmental assessment to determine the extent of contamination and if that contamination is impacting human health. The average cost of an assessment is approximately \$50,000, therefore, BER would be able to complete an additional 8 or 18 assessments with the additional \$400,000 or \$900,000. The additional funding would reduce the number of backlogged sites needing additional assessment by 15% or 34%, respectfully.

KGS Projects for Kansas Water Authority Budget Committee Consideration

The Kansas Geological Survey (KGS) is proposing two projects for funding consideration, both of which are directed at addressing important priorities identified in the 50 Year Water Vision. The overall goal of these projects is to provide critical information for managing the state's groundwater resources for decades to come.

1. Aquifer Modeling Maintenance Program (AMMP)

The High Plains aquifer, which includes the well-known Ogallala aquifer, is the most important water source for much of western and south-central Kansas, supplying 70 to 80% of the water used by Kansans each day. Water from the aquifer supports the region's cities, industry, and much of its agriculture. However, large-volume pumping from this aquifer has led to steadily declining water levels, particularly in western Kansas, and the region faces pressing water-related issues. Groundwater models have and will continue to be the primary tool for assessing what the future holds for this critically important resource for Kansas. We have received repeated requests from GMDs to update their existing models to incorporate the latest data and insights from KGS work. Although we have an experienced modeling group, it currently is too small to model more than one GMD at a time. The purpose of this funding would be to expand our group so that we can pursue more modeling projects concurrently. Given the pressing need to have the most up-to-date models to address issues of great importance for western Kansas, we designate the AMMP project as our highest priority.

Cost: \$150,000/yr – this is viewed as a recurrent cost so that we can continue to maintain and update aquifer models across the High Plains aquifer.

2. Long-term Operation of the Kansas River Index Well Network

In order to improve our understanding of the Kansas River alluvial aquifer and its relationship to Kansas River flow, we are currently establishing an index well network in the Kansas River alluvial aquifer that is similar to the KGS index well network in the High Plains aquifer. The first Kansas River index well will be operational shortly. A total of ten wells will be installed and equipped for real-time monitoring of water levels from upstream of Manhattan to the junction with the Missouri River. The information obtained from these wells will be used to develop a better understanding of how water levels respond to current pumping activity and how the aquifer and the Kansas River interact. The continuous water-level records from these wells will be accessible in real time to the general public through the KGS website in a manner similar to the High Plains aquifer index wells. The purpose of this funding is to support the long-term operation and maintenance of this index well network.

Cost: \$25,000/yr as a recurrent cost.

Kansas Department of Agriculture

Telemetry

Approximately 450 telemetry installations plus staff to install and maintain the installations. Telemetry would allow for remote observation of water right operations to increase management opportunities, study the effects of groundwater pumping on local aquifers and on neighboring wells in near-real time, and enhance enforcement in certain situations. (Budget - \$845,000)

Feed Wheat and Other Alternative, Less Water-Intensive Forages

Beef and dairy producers rely heavily on corn as the principal energy source in finishing cattle and dairy operations, and therefore have enormous impact on use of water for irrigation. Alternative crops that place less demand on precious water resources are needed to sustain the long-term viability of crop production throughout the irrigated regions of Kansas. Because the critical filling period for wheat and triticale occurs during cooler temperatures, relative to corn, it may be that they are superior candidates for converting limited water resources into meat and milk. Furthermore, wheat (and possibly triticale too) has several other key attributes that may prove useful in cattle feeding, potentially helping to alleviate nitrogen waste issues in feedlots, improving energetic efficiency for grain processing, and improved feed conversion. We propose to complete a series of experiments in an effort to identify attributes in wheat grain, as well as, triticale and Teff grass, which will provide a foundation for selection programs aimed at high-yielding forage varieties suitable as feed grains for finishing beef cattle and lactating dairy cattle. (Budget - \$225,000)

Water Right Transition Assistance Program (WTAP)

The WTAP program offers limited flexibility for permanent water right retirements as a conservation management tool – including enrollment for “partial” water rights and immediate conversion to dryland farming after the retirement. To date, 7,034 acre-feet of water rights have been retired in three approved target areas – Prairie Dog Creek, Rattlesnake Creek and GMD#4 High Priority Areas (HPAs). The interest in the Prairie Dog Creek area has been very minimal, and the six HPA areas in northwest Kansas are too numerous and too depleted for cost-effective results.

The WTAP program could be better refined to address further conservation efforts if restricted to just the Sheridan 6 HPA LEMA in northwest Kansas, the eastern portion of the Rattlesnake Creek corridor, and the Finney / Kearny county LEMA (if implemented). The current maximum bid price is \$2,000 per acre foot – which lately does not seem to be high enough (without local matching contributions) to draw any competitive offers. (Budget - \$1 million per year)

Conservation Reserve Enhancement Program (CREP)

The current enrollment in the Upper Ark CREP is 18,671 acres. To date, 37,430 acre-feet of vested and appropriated water rights have been retired. The project currently allows up to 28,950 acres, which leaves a balance of 10,279 acres to fill. Federal Services Agency (FSA) officials in two southwest Kansas counties with high water level decline areas (southern Kearny and Gray counties) are requesting that the county caps of 7,237 acres be expanded. Also, voluntary water right retirements in the developing Local Enhanced Management Area (LEMA) initiative in northern Finney and Kearny counties would provide a needed management alternative if the incentives are high enough to attract enrollment. (Budget - \$1.8 million)

Kansas Department of Agriculture

Interstate Water Compact Compliance

Additional interstate water engineer position in Garden City to monitor Colorado's compliance with the CO-KS Arkansas River compact. Colorado has a staff of over 20 to manage the Arkansas River basin in Colorado. Kansas has 2. It would be beneficial to Kansas water users to have more capacity to monitor Colorado actions in the basin. (Budget - \$100,000)

Water Structures Inspections

Additional engineers in the Stafford and Parsons Field offices to review water structures plans and perform inspections of water structures, channel changes and stream obstructions. These positions would benefit Kansas' by reducing travel time and thus increasing timeliness and efficiency of responding to complaints and issuing permits. (Budget - \$200,000)

Kansas Sediment and Nutrient Reduction Program

An initiative implemented by the Kansas Department of Agriculture, Division of Conservation to enhance participation under the Farm Service Agency continuous conservation reserve program by providing a one-time state incentive to supplement federal payments for grassed waterways, shallow water areas for wildlife, filter strips, riparian buffers, wetland restorations, farmable wetland/farmable wetland buffers, bottomland timber establishment and habitat buffers for upland birds.

For enrollment of 10,000 acres, the estimated total financial obligation will be approximately \$3.75 million with \$2.0 million provided by the State of Kansas in sign-up incentive payments and \$1.75 million to fund seven Water Quality Coordinator positions for five years. Water Quality Coordinators are needed for promoting the Sediment and Nutrient Reduction Initiative, local county NPS management plans, nine element plans and Kansas Sediment Reduction Plan. This includes information and education as well as promoting best management practices available from all cost-share programs. These positions would be located to service Brown, Jackson and Nemaha Counties; Washington and Marshall Counties; Shawnee, Douglas and Osage Counties; Clay Dickinson and Ottawa Counties; Lyon, Morris and Chase Counties; Marion, McPherson and Rice Counties; Ellis, Trego and Russell Counties. The Water Quality Coordinator positions would be housed in the following NRCS Management Units and would be employed by local Conservation Districts. (Budget - \$3.75 million)

State Aid to Conservation Districts

Provides matching funds (up to \$25,000 per district) to conservation districts. State aid provides incentive for the county commission to match and partner in maximum support / funding of activities (K.S.A. 2-1907c).

These funds assist the 105 county conservation districts to effectively deliver local, state, and federal natural resource programs as prescribed under Conservation District Law. At this time KDA-DOC is not able to fully match due to state budget restrictions. In 2010, the Legislature changed the state match from \$10,000 per county to \$25,000. Each year, from FY2011-FY2016, KDA – Division of Conservation (DOC) has made a supplemental budget request to receive the maximum allowable amount of \$2,625,000 for fully funding the Aid to Conservation Districts. In FY2018, Districts contributed \$2,410,912. (Budget - \$410,912)

Kansas Department of Agriculture

Conservation District Technician Contribution Agreement

Through a cooperative agreement between USDA Natural Resources Conservation Service (NRCS) and the Kansas Department of Agriculture, Division of Conservation, technical assistance is provided for best management practice design in high workload/high priority watersheds. Through the Contribution Agreement, training, workspace, vehicles, computers, etc. are provided by NRCS and technicians are hired by the participating conservation district. Currently, eleven technicians are part of this agreement, but additional technicians are needed to support the demand for projects in high priority areas. Proposed to add nine conservation district technicians. (Budget - \$200,000 per year)

Watershed Dam Construction

For the Watershed Dam Construction Program (WDCP), for FY 2018 KDA has \$528,157 in the budget (including FY 2017 carryover). FY 2018, the requested rehabilitation cost-share assistance amounts to \$1,122,647. In addition, KDA has 13 applications for new construction of flood control structures totaling more than \$1.3 million. One application will be shovel-ready in 2018 with a requested budget amount of \$120,000. (Budget - Rehab \$594,490; New Construction \$1.3 million (1 project shovel ready Spring of 2018))

Kansas Water Office

Irrigation Technology - \$1,000,000

Funds would be utilized to provide incentives to landowners/operators for irrigation technology adoption. Funding would be targeted to landowners/operators participating in a Water Conservation Area or Local Enhanced Management Area. *Vision: Technology and Crop Varieties (pgs. 28 & 29)*

Streambank Stabilization – \$1,000,000

Stabilization of 8-10 hotspot streambank erosion sites in the John Redmond Reservoir, Tuttle Creek Lake or Perry Lake watersheds. Sites for implementation have been prioritized based on the highest estimated sediment yield and proximity to the downstream reservoir. Stabilization of these sites would reduce the amount of sediment entering the river and downstream reservoir and restore the riparian buffer adjacent to the stabilized sites. *Neosho RAC Goal #1, Kansas RAC Goal #3*

Groundwater Model of the Kansas River Alluvial Aquifer - \$100,000

The Kansas River corridor is projected to continue to be a major area of population and economic expansion in the coming decades, and groundwater from the Kansas River alluvial aquifer will be utilized to help support that expansion. Currently, however, we do not have a groundwater model that enables us to assess how water levels in the aquifer and the Kansas River will respond to the increases in pumping that will undoubtedly accompany further development. In order to address this need, we propose to develop a model that extends from upstream of Manhattan to the junction with the Missouri River. This model would be used to examine the effects of future aquifer development on groundwater and river levels, as well as how river flow controlled by reservoir operations affects aquifer water levels. The model would be updated every five years in a manner similar to the AMMP project. The goal is to provide the state with a tool that is based on the most current data to evaluate future conditions in this most important aquifer in eastern Kansas. *Vision: Water Management Section (pg. 23)*

Bathymetry and Sediment Monitoring - \$100,000

Use of boat-mounted sonar to create a 3D map of the bottom of each reservoir. Once created, the current map would be compared to previous lake maps to determine the amount of storage that has been lost, how much remains, and how much is being lost on average annually. Surveys for most reservoirs have been completed; however, Waconda, Kirwin and Webster do not have completed surveys. Other federal lakes have surveys that were completed 7-10 years ago. Beginning another round of mapping will allow the state to better target resources to the areas losing the most storage. Collection of suspended sediment in the streams above the reservoir also would be completed to evaluate the effectiveness of installed streambank sites and other best management practices. *Vision: Technology and Crop Varieties Section (pg. 32), Neosho RAC Goal #1, Smoky Hill-Saline RAC Goal #3, Solomon –Republican RAC Goal # 3*

In-Lake Algae Bloom Activities - \$500,000

Focus on Milford Lake Harmful Blue-Green Algal Blooms (HABs) through study and sampling to better understand the spatial resolution and temporal frequency of phosphorus, nitrogen and chlorophyll concentrations in the upper zone of Milford Lake. Sampling/study efforts would attempt to geographically isolate the contributing areas that may support the cyanobloom in the lake toward late summer and autumn when loadings from the Republican River watershed have diminished with low flows. This information would be utilized to implement tactical treatment approaches to these “hot spots” and cut off the nutrient supply fueling the blooms. *Kansas RAC Goal #5*

Milford Lake RCPP Match - \$400,000

Funds would be used to incentivize landowners to participate in installation of nutrient and sediment reduction practices above Milford Reservoir. Incentive payments would leverage federal funding through the USDA-NRCS

program. Practices such as buffer strips, waterways, nutrient management programs and livestock practices will be implemented. **Kansas RAC Goal #5**

Kansas Basin Watershed Management System - \$250,000

Targeting of best management practices in conjunction with the Kansas Regional Advisory Committee to areas above federal reservoirs. Practices would be primarily focused on sediment reduction, with consideration given to practices which also reduce nutrients entering streams and reservoirs. **Kansas RAC Goal #3**

Vision Education Strategy - \$1,000,000

Implementation of a multipart educational strategic framework for target audiences of youth, municipalities, K-12, business entities, community leaders, media and the general public to address the education, communication and outreach action items from the Vision. **Vision: Education and Public Outreach Supplement, Marais des Cygnes RAC Goal #3, Missouri RAC Goal #4, Smoky Hill-Saline RAC Goal #2, Verdigris RAC Goal #2**

Equus Beds Chloride Plume Project - \$500,000

Chloride contamination within the Equus Beds Aquifer resulting from previous oil field production has resulted in areas of groundwater which is unsuitable for most uses. Remediation of areas of high chloride concentrations within the Equus Beds Aquifer would help generate an additional water supply source, as well as help protect and prolong the useable lifespan of groundwater wells around areas of chloride contamination. **Vision: Additional Sources of Supply (pg. 37), Equus-Walnut RAC Goal #5**

Water Technology Farms - \$250,000

Continued development and enhancement of demonstration farms that allow the installation and testing of the latest irrigation technologies and soil moisture management, as well as the opportunity to evaluate the effectiveness of conservation practice implementation in reducing sediment and nutrient runoff on a whole field scale. **Vision: Technology and Crop Varieties (pg. 29), Cimarron RAC Goals #1 & 2, Equus-Walnut RAC Goal #6, Neosho RAC Goal #1, Red Hills RAC Goal #1, Upper Arkansas RAC Goal #1, Upper Republican Goal #2**

MPSL/PL 566 Rehab Siting Evaluations - \$100,000

Determination of locations within regions that would benefit from the construction of Multi-Purpose Small Lakes (MPSL) for water supply, flood control, recreation, downstream sediment reduction, as well as conversion of flood storage to water supply storage within PL566 watershed structures. **Vision: Water Conservation (pg. 20) and Additional Sources of Supply (pg. 39), Kansas RAC Goal #2, Marais des Cygnes RAC Goal #2, Neosho RAC Goal #4, Red Hills RAC Goal #2, Verdigris RAC Goal #3**

Waters Leaving the State Legal Study - \$200,000

Evaluation of 2016 S. Sub. for HB 2059, which sought to amend certain procedures for the appropriation of surface water that would otherwise leave the State of Kansas; the effect of large-scale transfers of interstate water supplies on Kansas's relations with the water rights and interests of Native American Tribes within the Missouri River Basin and also in Oklahoma; and the legal and policy implications of large-scale transfers of interstate water supplies as they relate to the pursuit of effective and optimal methods of securing Kansas's ability to harvest Missouri River Basin flood flows.

Kansas Water Authority Budget Request: KBS and Joint KBS/KGS

Kansas Biological Survey

Reservoir Bathymetric Surveys and Biological Research

Bathymetric mapping of the bottom of Kansas water bodies is necessary to determine rates and patterns of sediment accumulation over time. As a result of sedimentation, reservoir capacity is reduced and pollutants as well as nutrients become concentrated in eroded sediments. This can lead to excessive plant growth and decay, as well as water quality degradation which impacts aquatic life, recreation, and drinking water processing expenses. Comparing water depth at various places around a lake with older lake maps enables the determination of sedimentation rates and patterns over time. This information is of key importance to lake managers and municipalities in the management of water supplies and to aquatic ecologists, fishermen and boaters. **\$100,000**

Kansas Geological Survey and Kansas Biological Survey:

Evaluating the Effectiveness of Streambank Stabilization in Reducing Sediment Yields

To date, most streambank stabilization projects in Kansas are done on a piecemeal basis, with little monitoring to assess the effectiveness in terms of reducing sediment yield and with little to no appreciation for the geomorphic and hydrologic processes operating in stream channels. Research has shown that restoration projects that attempt to create static or fixed forms (e.g., meanders with riprapped banks) commonly fail. Therefore, it is our conjecture that restoration of a *process* is more likely to succeed than restoration aimed at a fixed end point (i.e., bank stabilization). Importantly, assessing and restoring stream processes are more likely to address the *causes* of river degradation, which in Kansas have resulted in reservoir sedimentation, whereas restoration toward a fixed endpoint (i.e., stabilizing banks) addresses only the *symptoms*. The Kansas Geological Survey together with the Kansas Biological Survey therefore proposes to evaluate existing restoration projects in the context of stream processes. Such an evaluation focuses on the measurement of geomorphic characteristics with the understanding that interactions between the stream channel, floodplain, and stream flows are the dominant processes operating in stream channels. Also, such an approach requires assessing processes operating in a whole watershed rather than a single, isolated reach of a stream. Evaluating the success of current stabilization projects in terms of their impact on sediment yield is hampered by a lack of direct pre-project measurements. However, assessment of geomorphic and hydrologic processes may be achieved by analyzing historic data (e.g., maps, aerial imagery, USGS gaging station data, climate data). Reach-scale assessment of current and future change can be achieved by repeated cross sectional surveys in proximity to stabilization projects to assess changes in channel form and long profile surveys to assess changes in channel slope. **\$300,000**

Kansas Biological Survey

Reservoir Water Quality: Harmful Algal Blooms (HABs)

Some of the state's federal reservoirs and smaller impoundments experience harmful cyanobacterial blooms. These harmful algal blooms (HABs), also known as blue-green algae, cause problems in lakes, reservoirs, and rivers because they produce a potent suite of toxins that cause human and animal illness and even death. Cyanobacteria collected from Milford and Marion reservoirs by KBS staff are being grown under controlled conditions at the KU Field Station 8 miles from the main KU campus. KBS researchers seek to determine growth characteristics, predict reservoir susceptibility to HABs, determine conditions enabling prediction of HABs as toxin release events, and develop management recommendations. **\$100,000**

Attachment C

State Water Plan Fund Recommendation to the Kansas Water Authority
Priority Projects by KWA Budget Committee

FY2018 Enhancement Request	
Restore Carryover for Lake Restoration and move to Riparian & Wetland	\$ 281,312
FY2019 SGF/EDIF Transfer - Priority Projects Recommendation	
Irrigation Technology	\$ 1,000,000
Streambank Stabilization - SB team recommendation	\$ 1,000,000
Harmful Algae Bloom Pilot	\$ 500,000
Vision Implementation Research - Research Coordination Group	\$ 500,000
BMP Implementation - BMP Team	\$ 2,000,000
Vision Education Strategy	\$ 500,000
Water Technology Farms	\$ 250,000
Telemetry	\$ 845,000
Contamination Remediation	\$ 400,000
Equus Beds Chloride Plume Project	\$ 500,000
	\$ 7,495,000

Attachment D: Description
Kansas Water Authority Budget Committee Recommendations

FY2018 Enhancement

Riparian & Wetland - \$281,312

KDA was previously allocated \$281,312 in the Water Supply Restoration line item for a project at Gardner City Lake which ultimately could not be processed because of a latent water right inadequacy. The Division of Conservation had prior approval from the KDA Secretary to utilize these funds as seed money for the new Sediment & Nutrient Reduction Program authorized under K.S.A. 2016 Supp. 2-1915. The related program regulations which were intended to be completed during FY2017 are not finalized yet, so the plan was to allow the \$281,312 to be carried forward under the current line item and then transferred to the DOC's Riparian & Wetland line item immediately after the opening of the FY2018 budget cycle.

However, there was no FY18 Appropriation for the Water Supply Restoration fund, therefore KDA did not have the standard reappropriation language for this fund in the omnibus bill, and the money went back to the SWP mother fund.

FY2019 Recommendations

Irrigation Technology - \$1,000,000

Funds would be utilized to provide incentives to landowners/operators for irrigation technology adoption. Funding would be targeted to landowners/operators participating in a Water Conservation Area or Local Enhanced Management Area. ***Vision: Technology and Crop Varieties (pgs. 28 & 29)***

Streambank Stabilization – \$1,000,000

Stabilization of 8-10 hotspot streambank erosion sites in the John Redmond Reservoir, Tuttle Creek Lake or Perry Lake watersheds. Sites for implementation have been prioritized based on the highest estimated sediment yield and proximity to the downstream reservoir. Stabilization of these sites would reduce the amount of sediment entering the river and downstream reservoir and restore the riparian buffer adjacent to the stabilized sites. ***Neosho RAC Goal #1, Kansas RAC Goal #3***

Harmful Algae Bloom Pilot - \$500,000

The funding would utilize the funding to focus on Harmful Algae Blooms (HABs) at Milford and potentially Marion Reservoir. A portion of the funding would be contracted to enhance the phosphorus, nitrogen and chlorophyll sampling and investigation efforts within the reservoirs to identify sources and critical locations and other factors that are causing the proliferation and movement of the algae blooms. A portion of the funding will also be utilized to investigate/demonstrate possible in-lake treatment options such as ultrasound, superoxide or other chemical treatments. Some portion of the funding may be utilized to initiate renovation of the wetland complex at the upper end of Milford reservoir. ***Kansas RAC Goal #5***

Vision Implementation Research - \$500,000

A state-wide research coordination effort has been underway with representatives of K-State Research and Extension, Kansas Geological Survey, Kansas Biological Survey, the University of Kansas, U.S. Geological Survey, Kansas Department of Agriculture, Kansas Department of Health and Environment and the Kansas Water Office. The purpose of this group is to coordinate research needs and to facilitate statewide collaboration to support implementation of the Vision. The group has identified three major areas on which to concentrate efforts at this time: Water Quality, Ogallala-High Plains Groundwater Depletion, and Reservoir Sedimentation. Under each of these broad categories, the group will meet in the future to discuss specific focus areas in need of additional research. Small research coordination teams focusing on each of these areas are being convened to meet and discuss the needs and report back to the Research Coordination Group.

BMP Implementation - \$2,000,000

To protect water supply storage and improve water quality in reservoirs across Kansas that provides water to municipal and industrial customers through implementation of watershed conservation practices within Vision priority watersheds. Watershed conservation practices are individual or a combination of practices that are determined to be the most effective and practicable (including technological, economic, and institutional considerations) means of controlling non-point sources of pollution at levels compatible with resource and economic goals. ***Equus- Walnut RAC Goal #3 & #4 Kansas RAC Goal #3 & #5, Marais des Cygnes RAC Goal #1, Missouri RAC Goal #2, Neosho RAC Goal #1, #3, and #5, Smoky Hill-Saline RAC Goal #3, Solomon-Republican RAC Goal #2, Verdigris RAC Goal #1***

Vision Education Strategy - \$500,000

Implementation of a multipart educational strategic framework for target audiences of youth, municipalities, K-12, business entities, community leaders, media and the general public to address the education, communication and outreach action items from the Vision. ***Vision: Education and Public Outreach Supplement, Marais des Cygnes RAC Goal #3, Missouri RAC Goal #4, Smoky Hill-Saline RAC Goal #2, Verdigris RAC Goal #2***

Water Technology Farms - \$250,000

Continued development and enhancement of demonstration farms that allow the installation and testing of the latest irrigation technologies and soil moisture management, as well as the opportunity to evaluate the effectiveness of conservation practice implementation in reducing sediment and nutrient runoff on a whole field scale. ***Vision: Technology and Crop Varieties (pg. 29), Cimarron RAC Goals #1 & 2, Equus-Walnut RAC Goal #6, Neosho RAC Goal #1, Red Hills RAC Goal #1, Upper Arkansas RAC Goal #1, Upper Republican Goal #2***

Telemetry - \$845,000

Approximately 450 telemetry installations plus staff to install and maintain the installations. Telemetry would allow for remote observation of water right operations to increase management opportunities, study the effects of groundwater pumping on local aquifers and on neighboring wells in near-real time, and enhance enforcement in certain situations.

Contamination Remediation – Orphan Site Program - \$400,000

This program uses these funds to address environmental contamination that have impacted soils, sediments, surface water and groundwater at orphaned sites. There are 53 orphan sites that are in need of a significant environmental assessment to determine the extent of contamination and if that contamination is impacting human health. The average cost of an assessment is approximately \$50,000, therefore, BER would be able to complete an additional 8 assessments with the additional \$400,000. The additional funding would reduce the number of backlogged sites needing additional assessment by 15% or 34%, respectfully.

Equus Beds Chloride Plume Project - \$500,000

Chloride contamination within the Equus Beds Aquifer resulting from previous oil field production has resulted in areas of groundwater which is unsuitable for most uses. Remediation of areas of high chloride concentrations within the Equus Beds Aquifer would help generate an additional water supply source, as well as help protect and prolong the useable lifespan of groundwater wells around areas of chloride contamination. ***Vision: Additional Sources of Supply (pg. 37), Equus-Walnut RAC Goal #5***