

# KANSAS WATER AUTHORITY 2022

*Annual Report to the  
Governor and Legislature*





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## Letter from the Chair

### *Governor Laura Kelly and Members of the 2022 Kansas Legislature*

On behalf of the Kansas Water Authority (KWA), it is my pleasure to present our 2022 Annual Report to the Governor and Legislature. This report is presented to you in keeping with the responsibilities of the KWA to advise the Governor and Legislature on Kansas water policy matters and to share the priorities identified by the KWA relative to the expenditure of the State Water Plan Fund (SWPF).



**“We have teams of scientists, agency personnel and the non-profit sector working together on innovative technologies and creative solutions. I feel confident that we have the right people, at the right time, to solve problems together.”**

The Kansas Water Authority (KWA) is tasked with approving the Kansas Water Plan (KWP), a comprehensive document that incorporates the characteristics mandated by the State Water Resources Planning Act: comprehensive, coordinated and continuous adaptive planning. This adaptive planning process is the cornerstone of our work to prepare for the future. In preparing the 2022 KWP, the Kansas Water Office (KWO) sought the input of the KWA and the Regional Advisory Committees. These groups worked hard to focus their collective efforts on getting it right. This important document will guide the water planning process and funding priorities in Kansas for years to come.

The year 2021 once again proved to be a challenge with the continuing COVID-19 pandemic. We’ve adapted to changes in our daily routines and found new ways to get things done. Likewise, the KWP team applied these lessons in adaptation as they developed the next Kansas Water Plan. For the first time, the 2022 plan will include strategies that will be useful as we work to mitigate the impacts of, and adapt to, a changing climate. Changes in rainfall patterns, temperatures and an increase in extreme weather events will put ever-increasing pressure on our water resources. Incorporating strategies into the Kansas Water Plan to mitigate these impacts is critical to future water resources protection and planning.

We face many challenges in securing a safe reliable water supply: reservoir sedimentation, aquifer depletion, surface and groundwater pollution, and extreme events. However, there is hope for the future. We have teams of scientists, agency personnel and the non-profit sector working together on innovative technologies and creative solutions. I feel confident that we have the right people, at the right time, to solve problems together. However, a secure and adequate funding source is essential. It will take all Kansans to make water a priority by securing necessary funding for the KWP.

The KWA appreciates the 2021 Kansas Legislature’s demonstrated commitment to these priorities, through partially restoring the \$6 million State General Fund (SGF) and \$2 million Economic Development Initiatives Fund (EDIF) demand transfers to the SWPF. The KWA continues to urge the Governor and Legislature to fully fund the \$8 million combined statutory transfers, even as we acknowledge that the funding needed for water far exceeds this amount.

The time is now for us to move this conversation forward and act to secure the long-term sustainability of Kansas water and a healthy future for our children. We hope that you will join us to make water a priority for every corner of our beautiful state.

Sincerely,



Dawn Buehler, Chair  
Kansas Water Authority

## State Water Plan Fund Recommendations

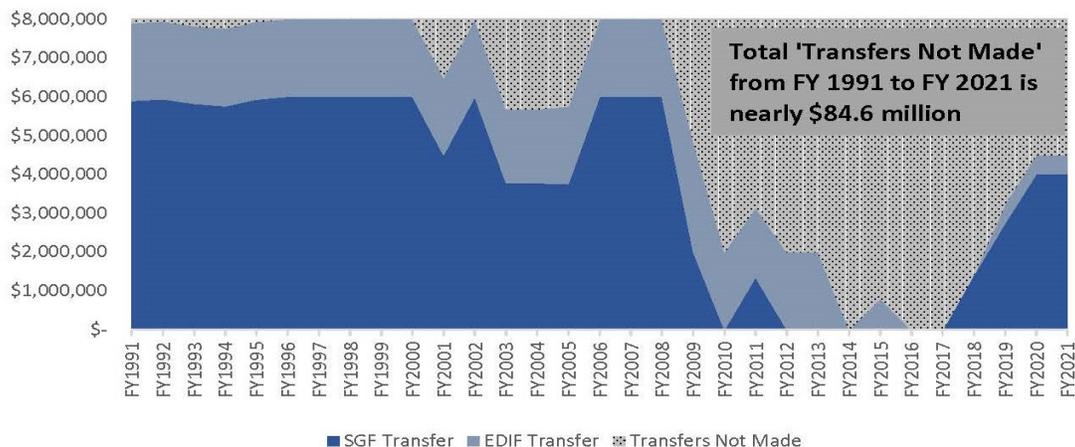
In 1989, the SWPF (K.S.A. 82a-951) was created and is used for establishing and implementing water-related programs or projects identified in the Kansas Water Plan. Revenue for the SWPF is received from fees assessed to municipal, industrial and agricultural water-related users and includes a demand transfer (statutory) from the SGF (\$6 million) and EDIF (\$2 million) as shown in the table below.

### State Water Plan Fund Revenue Estimate

SWPF Revenue Estimates	FY 2021 Actuals	FY 2022 Estimates	FY 2023 Recommendations
<b>Beginning Balance</b>	\$ 4,732,980	\$ 5,930,174	\$ 1,324,609
<b>Transfers and Adjustments</b>			
State General Fund Transfer	\$ 6,000,000	\$ 4,005,632	\$ 6,000,000
Economic Development Fund Transfer	\$ 913,325	\$ 1,719,264	\$ 2,000,000
Release of Prior Year Encumbrance	\$ 1,027,969	\$ -	\$ -
Other Service Charges	\$ 46,294	\$ 51,482	\$ 50,000
FY 2021 Governor's Allotment	\$ (2,407,699)	\$ -	\$ -
Transfers to SGF - John Redmond Bond	\$ (1,260,426)	\$ (1,260,426)	\$ (1,260,426)
<b>SUBTOTAL--Adjustments</b>	<b>\$ 4,319,463</b>	<b>\$ 4,515,952</b>	<b>\$ 6,789,574</b>
<b>Receipts</b>			
Municipal Water Fees	\$ 3,086,612	\$ 3,174,791	\$ 3,167,209
Clean Drinking Water Fee Fund	\$ 2,794,133	\$ 2,830,876	\$ 2,738,890
Industrial Water Fees	\$ 724,951	\$ 916,874	\$ 850,000
Stock Water Fees	\$ 482,459	\$ 384,120	\$ 375,000
Pesticide Registration Fees	\$ 1,522,250	\$ 1,362,734	\$ 1,365,000
Fertilizer Registration Fees	\$ 4,161,963	\$ 3,781,386	\$ 3,829,194
Pollution Fines and Penalties	\$ 135,519	\$ 200,000	\$ 200,000
Sand Royalties	\$ 17,166	\$ 30,000	\$ 25,000
<b>SUBTOTAL--Receipts</b>	<b>\$ 12,925,053</b>	<b>\$ 12,680,781</b>	<b>\$ 12,550,293</b>
Total Available	\$ 21,977,495	\$ 23,126,906	\$ 20,664,476
Less: Expenditures	\$ 16,047,323	\$ 21,802,297	\$ 20,454,982
<b>Ending Balance</b>	<b>\$ 5,930,173</b>	<b>\$ 1,324,609</b>	<b>\$ 209,494</b>

The fee structure that supports the SWPF has remained virtually unchanged since the fund was established in 1989. Sand Royalty Receipts were added to the funding stream in FY 1996 and the Clean Drinking Water Fee began in FY 2008.

SGF & EDIF Demand Transfers to SWPF



The above chart represents the historical SGF and EDIF transfers to the SWPF. As shown, FY 2008 was the most recent year the legislature approved the full \$8,000,000 statutory demand transfers from these two funds.

## State Water Plan Fund Expenditure Recommendations

Agency/Program	FY 2021 Actuals	FY 2022 Appropriation w/carry forward	FY 2023 KWA Recommendations
<b>Department of Health and Environment</b>			
Contamination Remediation	\$ 1,089,869	\$ 1,088,772	\$ 1,088,301
Nonpoint Source Program	\$ 393,118	\$ 316,247	\$ 403,208
TMDL Initiatives	\$ 275,574	\$ 345,232	\$ 380,738
Harmful Algae Bloom Pilot	\$ 326,697	\$ 1,272,064	\$ 150,000
Watershed Restoration/Protection (WRAPS)	\$ 752,127	\$ 730,884	\$ 1,000,000
Drinking Water Protection Program	\$ 264,346	\$ 350,000	\$ 800,000
<b>SUBTOTAL--KDHE</b>	<b>\$ 3,101,731</b>	<b>\$ 4,103,199</b>	<b>\$ 3,822,247</b>
<b>Department of Agriculture</b>			
Interstate Water Issues	\$ 435,436	\$ 722,886	\$ 499,281
Subbasin Water Resources Management	\$ 443,342	\$ 979,587	\$ 621,651
Water Use	\$ 65,908	\$ 143,531	\$ 100,000
Water Resources Cost Share	\$ 2,404,488	\$ 2,475,044	\$ 2,698,289
Nonpoint Source Pollution Asst.	\$ 2,002,236	\$ 1,978,238	\$ 1,860,104
Aid to Conservation Districts	\$ 2,192,637	\$ 2,223,373	\$ 2,473,373
Watershed Dam Construction	\$ 411,715	\$ 688,285	\$ 550,000
Water Quality Buffer Initiative	\$ 192,855	\$ 436,599	\$ 200,000
Riparian and Wetland Program	\$ 80,479	\$ 555,840	\$ 154,024
Water Transition Assistance Program/CREP	\$ 132,709	\$ 768,820	\$ 546,593
Irrigation Technology	\$ 76,178	\$ 325,046	\$ 350,000
Crop and Livestock Research	\$ 350,000	\$ 250,000	\$ 250,000
Soil Health		\$ -	\$ 100,000
Streambank Stabilization	\$ 1,196,678	\$ 918,286	\$ 750,000
Transfer for KRPI* (Water Supply/Lake Rest.)	\$ 769,915	\$ -	\$ -
<b>SUBTOTAL--KDA</b>	<b>\$ 10,754,576</b>	<b>\$ 12,465,535</b>	<b>\$ 11,153,315</b>
<b>Kansas Water Office</b>			
Assessment and Evaluation	\$ 491,110	\$ 812,287	\$ 850,000
MOU - Storage Operations & Maintenance	\$ 582,408	\$ 578,862	\$ 514,542
Stream Gaging	\$ 413,580	\$ 423,130	\$ 413,580
Technical Assistance to Water Users	\$ 325,000	\$ 341,391	\$ 325,000
Vision Education Strategy	\$ 225	\$ 224,775	\$ 250,000
Reservoir and Water Quality Research	\$ 266,027	\$ 486,277	\$ 350,000
Water Technology Farms	\$ 4,125	\$ 175,000	\$ 200,000
Watershed Conservation Practice Imp (KRPI)	\$ -	\$ 550,000	\$ 1,000,000
Equus Beds Chloride Plume Project	\$ -	\$ -	\$ 50,000
Milford Lake Watershed RCPP	\$ 20,000	\$ 580,000	\$ 50,000
Water Injection Dredging (WID)	\$ -	\$ 975,000	\$ 875,000
Arbuckle Study	\$ 61,700	\$ 60,000	\$ 150,000
Flood Response Study	\$ -	\$ -	\$ 200,000
<b>SUBTOTAL--KWO</b>	<b>\$ 2,164,175</b>	<b>\$ 5,206,722</b>	<b>\$ 5,228,122</b>
<b>Department of Wildlife &amp; Parks</b>			
Aquatic Nuisance Species (ANS) Program	\$ -	\$ -	\$ 224,457
<b>University of Kansas--Geological Survey</b>	<b>\$ 26,841</b>	<b>\$ 26,841</b>	<b>\$ 26,841</b>
<b>Total State Water Plan Expenditures</b>	<b>\$ 16,047,323</b>	<b>\$ 21,802,297</b>	<b>\$ 20,454,982</b>

## Summary of Request for SGF/EDIF Transfer Restoration

After reviewing the agency and RAC requests, the KWA recommended projects for the SGF/EDIF transfers in FY 2023 and the KWA supports restoration of the full \$8 million SGF/EDIF demand transfer to the SWPF.

The table to the right shows the additional SGF/EDIF requests for the indicated programs that are an increase from the FY 2022 Appropriation.

The KWA will continue to focus funding on priority projects that are in the KWP, along with KWA and RAC goals/action plans consistent with the KWP. Page 3 of this report contains the KWA total SWPF recommendations for FY 2023.

KWA SWPF Recommendations	Agency	FY 2023 KWA Add'l Requests
Watershed Restoration/Protection (WRAPS) (pg. 14)	KDHE	\$ 269,116
Drinking Water Protection Program (pg. 16)	KDHE	\$ 450,000
Total Maximum Daily Load Program (pg. 20)	KDHE	\$ 100,000
Subbasin Water Resources Management (pg. 6)	KDA	\$ 37,628
Water Use (pg. 6)	KDA	\$ 27,400
Irrigation Technology (pg. 7)	KDA	\$ 100,000
Water Transition Assistance Program/CREP (pg. 8)	KDA	\$ 100,000
Water Resources Cost Share (pg. 16)	KDA	\$ 450,000
Non-Point Source Pollution Assistance (pg. 18)	KDA	\$ 6,919
Aid to Conservation Districts (pg. 18)	KDA	\$ 250,000
Soil Health (pg. 15)	KDA	\$ 100,000
Water Technology Farms (pg. 7)	KWO	\$ 100,000
Watershed Conservation Practice Imp (pg. 11)	KWO	\$ 450,000
Equus Beds Chloride Plume Project (pg. 17)	KWO	\$ 50,000
Arbuckle Study (pg. 19)	KWO	\$ 90,000
Flood Response Study (pg. 24)	KWO	\$ 200,000
Aquatic Nuisance Species (pg. 20)	KDWP	\$ 224,457

## Kansas Water Plan 5-Year Update *Incorporation of Vision & Updated RAC Goals and Action Plans*

The Kansas Water Office continues to make progress on updates to the Kansas Water Plan (KWP). The updated KWP includes incorporation of the 'Long Term Vision for the Future of Water Supply in Kansas', as well as an appendix of the goals and action plans submitted by the 14 RACs.

The updated KWP will include strategies to address ongoing and emerging water resource issues of the state, including focused efforts on groundwater declines, decreasing reservoir water supply storage lost to sedimentation, statewide water quality issues, and increasing awareness of these water issues across the state.

In 2021, KWO staff continued efforts to solicit input from the RACs and other stakeholders, groups and organizations as the updated plan continued to be developed. The KWO compiled a draft document for KWA initial review, facilitated two public hearings for comment on the draft KWP, and is presently reviewing the public comments received for inclusion and KWA approval of the final document.



The updated Kansas Water Plan will serve as the state's primary tool to address current water resource issues and to plan for future needs.

The updated KWP includes the following Guiding Principle sections:

- Conserve & Extend the High Plains Aquifer
- Secure, Protect and Restore Kansas Reservoirs
- Improve the State's Water Quality
- Reduce Vulnerability to Extreme Events
- Increase Awareness of Kansas Water Resources

# KWA Performance-Based Budgeting

## Kansas Water Plan Budget Guidelines

Recognizing the purpose of the SWPF is to implement the KWP, and the adoption of performance based budgeting by the state in recent years, the KWA adopted a set of budget guidelines in January 2020. The guidelines, consisting of eight guiding principles, were utilized by the KWA Budget Committee to develop the KWA SWPF budget recommendations for FY 2023 presented within this report.

The KWO has worked with the other agencies to categorize the SWP-funded programs into the major water resource issues they are primarily addressing (see table below) in order to determine priorities and to evaluate measures of success.

With limited resources, the KWA continues efforts to balance the competing needs and requests for the SWPF, and to identify which programs and practices will provide the biggest return on investment. As indicated in the table below, many of the programs address multiple issues. The KWO continues to work with the other agencies to refine the categories and programs.

**“Water Plan Funds should be allocated to maximize accomplishing the goals and objectives established by the Kansas Statutes, the Kansas Water Authority and the Regional Advisory Committees.”**

- Kansas Water Plan Budget Guidelines  
KWA

### KWA SWPF Budget Recommendations by Category

Category	Program Name	Agency	FY2023 KWA Total Recommendations
Groundwater Initiatives	Water TAP/CREP	KDA	\$546,593
	Irrigation Technology	KDA	\$350,000
	Crop and Livestock Research	KDA	\$250,000
	Water Technology Farms	KWO	\$200,000
	Kansas Geological Survey	KGS	\$26,841
Groundwater Initiatives & Water Quality	Interstate Water Issues	KDA	\$499,281
	Subbasin Water Resources Management	KDA	\$621,651
	Water Use	KDA	\$100,000
GW Initiatives, WQ & Res. WS & Sed	Vision Education Strategy	KWO	\$250,000
	Assessment and Evaluation	KWO	\$850,000
	Flood Response Study	KWO	\$200,000
Water Quality	Contamination Remediation	KDHE	\$1,088,301
	Nonpoint Source Program	KDHE	\$403,208
	TMDL Initiatives	KDHE	\$380,738
	Harmful Algae Bloom Pilot	KDHE	\$150,000
	Watershed Restoration/Protection	KDHE	\$1,000,000
	Drinking Water Protection Program	KDHE	\$800,000
	Nonpoint Source Pollution Asst.	KDA	\$1,860,104
	Soil Health	KDA	\$100,000
	Technical Assistance to Water Users	KWO	\$325,000
	Equus Beds Chloride Plume Project	KWO	\$50,000
	Milford Lake Watershed RCPP	KWO	\$50,000
	Arbuckle Study	KWO	\$150,000
Aquatic Nuisance Species Program	KDWP	\$224,457	
Water Quality/Res. Water Supply & Sedimentation	Aid to Conservation Districts	KDA	\$2,473,373
	Riparian and Wetland Program	KDA	\$154,024
	Stream Gaging	KWO	\$413,580
	Reservoir and Water Quality Research	KWO	\$350,000
Reservoir Water Supply & Sedimentation	Water Resources Cost Share	KDA	\$2,698,289
	Watershed Dam Construction	KDA	\$550,000
	Water Quality Buffer Initiative	KDA	\$200,000
	Streambank Stabilization	KDA	\$750,000
	MOU - Storage Operations & Maintenance	KWO	\$514,542
	Watershed Conservation Practice Imp	KWO	\$1,000,000
	Water Injection Dredging (WID)	KWO	\$875,000

## Ogallala Aquifer Initiatives

### Water Conservation Areas/Local Enhanced Management Areas

Subbasin Water Resources Management (KDA) - FY 2023 Request - \$621,651 (↑ \$37,628 from FY 2022)

Water Use (KDA); FY 2023 Request - \$100,000 (↑ \$27,400 from FY 2022)

#### Water Conservation Areas

WCAs are a simple, streamlined and flexible tool that allow any water right owner or group of owners the opportunity to voluntarily develop a management plan to reduce withdrawals in an effort to extend the usable life of the High Plains Aquifer.

WCAs allow flexibilities that are not available to water right owners outside of a WCA.

Flexibilities include elements such as:

- Multi-year water right allocations.
- Moving allocations between enrolled water rights.
- Allowing for new uses of water.



### 2021 Ogallala Aquifer Initiatives Accomplishments

# 53

#### Water Conservation Areas

WCAs with 86,625 total enrolled acres. To date the planned savings is more than 11,900 af/yr.

# 39%

#### Local Enhanced Management Areas

Reductions by the SD-6 LEMA from historical water use. There are currently three approved LEMAs in the state of Kansas.



### Local Enhanced Management Areas

Sheridan County 6 (SD 6), was the first approved LEMA in Kansas. After initially meeting a water conservation goal of 20%, LEMA participants almost doubled it, reducing withdrawals by 39%. Per KGS, the SD 6 area has nearly doubled the life of its aquifer.

Groundwater Management District (GMD) No. 4 has since developed another LEMA, which regulates nearly their entire district.

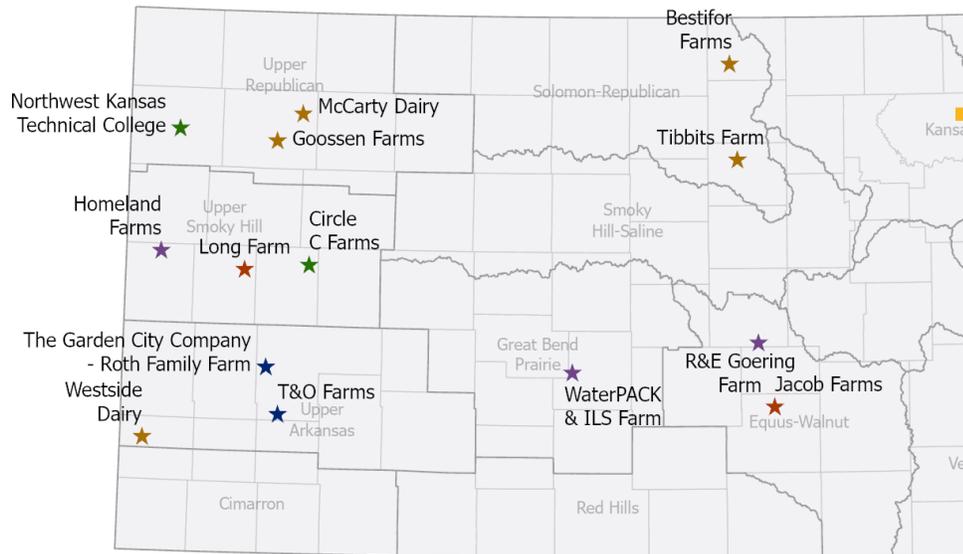
The success of GMD No. 4's execution of LEMAs has motivated other GMDs to look towards implementing them into their regions as well.

In 2020, GMD No. 1 filed a request to initiate proceedings for a Wichita County LEMA. The proposed LEMA plan called for reductions in water use in those areas of Wichita County within GMD No. 1. In 2021, this LEMA was approved and water users are making appropriate adjustments during the first year of implementation.

# Ogallala Aquifer Initiatives

## KWO Water Technology Farms - FY 2023 Request \$200,000 (↑ \$100,000 from FY 2022)

Water Technology Farms continue to showcase the latest in irrigation technology, field-scale research, and water conservation efforts. These farms are public-private partnerships that began in 2016 and continue to demonstrate producers can reduce water use and input costs, while increasing overall profitability.



**“Our goal, in water conservation is to be able to raise our families, grow crops, and support livestock, for generations to come. How we do it is the only factor that differs from what has been done in generations past ”**

- Matt Long  
Long Water Technology Farm

2021 Water Technology Farms

Tech Farm Since  
★ 2016 ★ 2017 ★ 2018 ★ 2019 ★ 2020

August 2021  
Kansas Water Office

## KDA Irrigation Technology - FY 2023 Request \$350,000 (↑ \$100,000 from FY 2022)

As groundwater declines continue to impact aquifer conditions and surrounding hydrology, producers are becoming more interested in implementing innovative tools to improve irrigation water management.

This funding is used to improve irrigation efficiency and reduce water use by providing cost-share assistance to landowners for irrigation technology.



### 2021 Ogallala Aquifer Initiatives Accomplishments

**14** **Water Technology Farms**  
total farms enrolled to expand the concept to additional areas of Kansas. More than 100 sponsors and partners working together to save water and increase overall net profit.

**1.7K+** **Irrigation Technology**  
acres were improved with the FY 2021 funding through irrigation management.

The Irrigation Technology program is currently focused on the Rattlesnake Creek Sub-basin and the LEMA areas in GMD No. 4.

Moving forward, the program is working in conjunction with the GMDs to increase effectiveness and leverage additional resources to improve technology utilization across high water level decline areas in the High Plains Aquifer.

## Ogallala Aquifer Initiatives

### KDA Water Transition Assistance Program/Conservation Reserve Enhancement Program

FY 2023 Request: \$546,593 (↑ \$100,000 from FY 2022)

The purpose of the Water Transition Assistance Program (WTAP) is to reduce Historic Consumptive Water Use (HCWU) in targeted areas by permanently retiring irrigation water rights with incentive-based cost-share. Priority areas are targeted and approved by the KDA-DOC, with recommendations from GMDs in applicable areas.

WTAP differs from the Conservation Reserve Enhancement Program (CREP) in that:

- The funding mechanism is solely state-driven.
- Partial water rights can be retired.
- Dryland farming is allowed.

**A new conservation practice called 'Prairie Strips', which incorporates dryland farming opportunities, was approved for the CREP program in 2021 and will be added to eligible practices in the coming year.**

The CREP is designed to permanently retire water rights in the Upper Arkansas River Basin, a 10-county project area in western Kansas, while also providing other related benefits such as soil conservation, water quality protection, energy savings, and wildlife habitat enhancement. A landowner is compensated for agreeing to enroll in continuous CRP, permanently retire related irrigation water rights and plant a permanent cover (e.g. prairie grass or wildlife habitat mixture) on the contracted land. So far, 212 irrigation wells and 169 water rights have been voluntarily dismissed in the Ark River project area.

CREP is a federal and state partnership where 80% of the costs are paid by USDA. The KDA is currently working with USDA and other partners to open CREP enrollment in the Rattlesnake Creek Sub-basin for 2022.



### Index Well Network & Modeling

#### Funded through KWO Assessment and Evaluation Program

The KWO and KGS have a continued partnership to develop, monitor, and expand the High Plains Index Well Network. The overall objective of the index well program is to better understand groundwater conditions on regional and local scales. Index wells are used to calibrate annual water level measurements to aid in aquifer evaluation and management. The network currently consists of 27 index wells and 7 expansion wells with real-time data access from the KGS website.

### 2021 Ogallala Aquifer Initiatives Accomplishments

# 25

#### Water Transition Assistance Program

enrollments to date, which retired 7,089 acre-feet of HCWU with a total of \$3,600,409 of state money spent.

# +\$1.6 Million

#### Conservation Reserve Enhancement Program

in direct cash contributions as incentive payments on 23,455 enrolled acres, with 47,643 acre-feet of annual water rights permanently retired.

# 27

#### Index Well Network & Modeling

index wells and 7 expansion wells operational in GMDs No. 1, 2, 3, 4, and 5, as well as a completed GMD No. 4 model.

KWO's Assessment and Evaluation program continues to provide funding for these efforts, utilized in conjunction with funds from participating GMDs to contract with KGS for groundwater model updates and enhancements.

The KGS completed models for GMD No. 2 and GMD No. 4 in 2020 and 2021, respectively, and is currently working on a model for GMD No. 3.



# Reservoir Water Supply & Sediment Management

## KWO Bathymetric Survey Program

Funded through KWO Reservoir and Water Quality Research Program

Kansas reservoirs are being filled with sediment, some at a faster rate than others, reducing the amount of water available for water supply, flood control, and recreational benefits to the citizens and industries of the state. The KWO is working to increase data collection and future reservoir volume estimates, while looking into new initiatives to extend the usable lifetimes of our reservoirs.

In 2019, the KWO launched the Bathymetry and Storage Evaluation (BaSE) program to increase the frequency of bathymetric data collection for Kansas water supply reservoirs/lakes. These underwater surveys estimate water depth and topography to determine how much sediment has accumulated on the bottom of the reservoir.

The BaSE program will allow KWO to work towards completing bathymetric surveys on a five-year rotation on multiple reservoirs, to gain a better understanding of reservoir conditions and sedimentation rates impacting future water supply planning.

Funding received since 2019 has allowed the KWO to measure impacts to reservoir water supplies after the record 2019 flooding, enabling updated water supply projections and improving future water supply planning.

KWO has been working to update bathymetric surveys at reservoirs within the Kansas River Basin in collaboration with the federal government for the current Kansas River Reservoirs Flood and Sediment study.



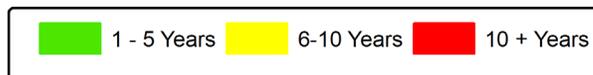
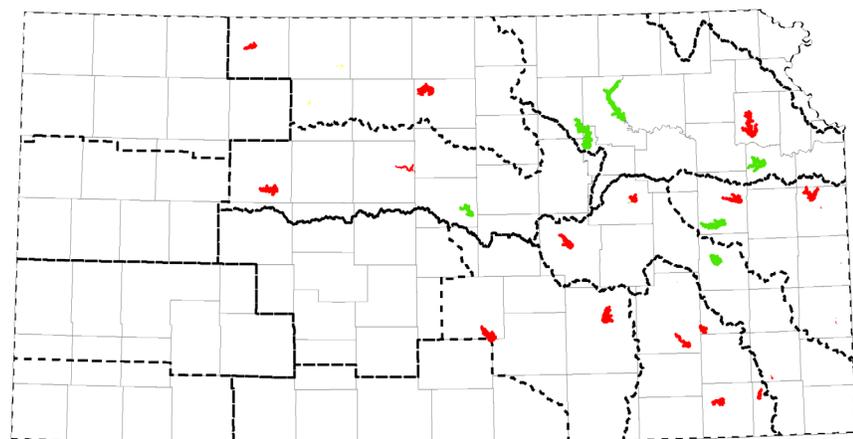
### 2021 Reservoir Water Supply & Sediment Management Accomplishments

1

#### KWO Bathymetric Survey Program

survey at Perry lake is being completed in 2021, providing data on reservoir conditions following the record flooding of 2019 and to update Kansas River water planning.

Years since last reservoir survey



## Reservoir Water Supply & Sediment Management

### *KWO Water Injection Dredging - FY 2023 Request: \$875,000 (No increase from FY 2022)*

Sediment filling valuable reservoir storage is a significant problem throughout Kansas. Recent estimates from the KWO indicate that approximately 50% of Tuttle Creek Lake's original conservation pool storage capacity has been lost due to sedimentation.

In response to this issue, the KWO has been working with the U.S. Army Corps of Engineers (USACE) Kansas City District and the USACE Engineer Research and Development Center (ERDC) to pursue a WID (Water Injection Dredging) demonstration at Tuttle Creek Lake.

The proposed demonstration project includes the following major components:

1. Construction of a WID prototype.
2. Demonstration of the WID prototype at Tuttle Creek Lake at different elevations and flow discharges.
3. Monitoring and evaluation of both the operational and environmental results.

The demonstration would evaluate if injecting water into the reservoir bed to resuspend sediment and allowing it to be discharged downstream through the low-level outlet, using WID, is a viable means of sustaining long-term use and water storage at Tuttle Creek Lake and other reservoirs.



### **KDA Streambank Stabilization**

#### ***FY 2023 Request \$750,000 (No increase from FY 2022)***

Streambank stabilization continues to be a key component in the reduction of sediment entering our water supply reservoirs. The KDHE, KDA-DOC and KWO coordinate efforts, resources and pooled funding to accomplish streambank protection aimed at reducing erosion in priority watersheds.

Streambank Stabilization efforts continue to be concentrated in three priority Kansas watersheds above Federal reservoirs:

- Tuttle Creek Lake
- Perry Lake
- John Redmond Reservoir

**Tuttle Creek Lake is a vital resource within the Kansas River Basin; its continued loss of capacity and impending impact to the authorized purposes are major concerns for Kansas.**

### **2021 Reservoir Water Supply & Sediment Management Accomplishments**

1

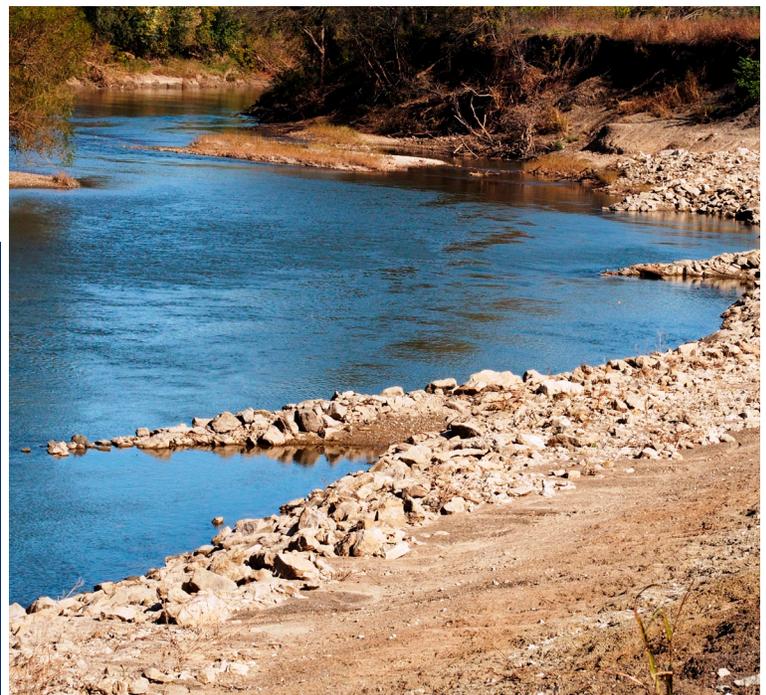
#### **Water Injection Dredging**

agreement for Planning Assistance to States (PAS) between USACE and KWO continues ongoing research, data collection, lab studies and numerical analysis to support WID demonstration.

15

#### **Streambank Stabilization**

sites under construction or completed this year. These sites were contributing a total 47,400 tons of sediment/year prior to stabilization.



# Reservoir Water Supply & Sediment Management

## KWO Watershed Conservation Practice Implementation

### FY 2023 Request \$1,000,000

(↑ \$450,000 from FY 2022)

Water storage is being diminished over time due to reservoir sedimentation. Water quality is also being impacted in both streams and reservoirs by nutrient runoff, potentially resulting in harmful algal blooms, taste and odor issues with drinking water, and impacts to recreation in Kansas.

To help address these concerns, watershed conservation practice implementation within priority watersheds above key reservoirs protects water supply storage and improves water quality through the reduction of sediment and nutrient runoff.

Currently, these funds provide financial assistance to landowners in the Fall River, Kanopolis, John Redmond and Tuttle Creek watersheds for sediment-reducing practices through the Kansas Reservoir Protection Initiative (KRPI). This requested level of funding would provide the opportunity for expansion of KRPI to additional watersheds of reservoirs impacted by sedimentation.



#### Common types of practices to reduce sediment and nutrient runoff include:

- cover crops
- grassed waterways
- buffer strips

## KDA Watershed Dam Construction

### FY 2023 - Request \$550,000

(No increase from FY 2022)

This program provides financial assistance to organized watershed districts, drainage districts, and other special purpose districts for the preservation and protection of the state's land and water resources.

Watershed dam construction and rehabilitation in Kansas is driven by increasing demands of both flood control and sediment reduction above federal reservoirs that have water supply components.

In past years, there have been few requests for construction of new structures due to restrictive federal mitigation requirements. In 2019, there was one new watershed dam construction for flood control.

For FY 2022, the KDA-DOC received cost-share applications amounting to \$2.4 million for rehabilitation of 28 existing flood control dams. The FY 2022 appropriation was \$550,000, which would cover approximately 23% of the total cost-share requests, but \$138,000 carry-over from FY 2021 enabled cost-share for 29% of the amounts requested.

### 2021 Reservoir Water Supply & Sediment Management Accomplishments

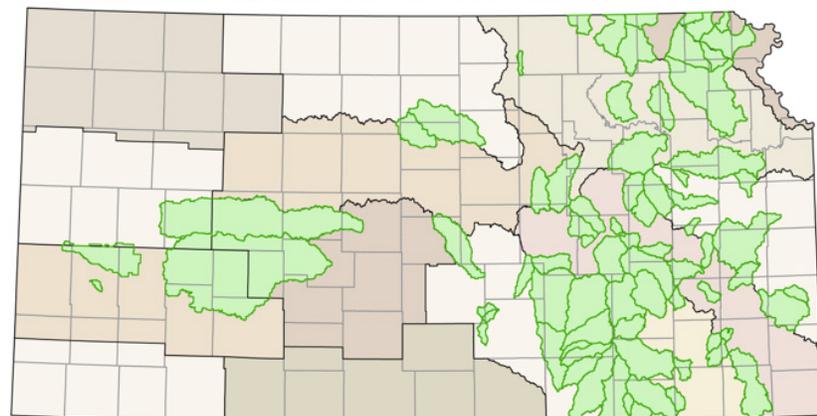
17K+

**Watershed Conservation Practice Implementation**  
acres benefitted from sediment-reducing practices with FY 2021 funding.

23%

**Watershed Dam Construction**  
of the state is covered by watershed districts. Since FY 2012, 86 structures have had rehabilitation work, for a total state cost-share of \$5.2 million.

Active Watershed Districts in Kansas



# Reservoir Water Supply & Sediment Management

## KWO Unfunded Liability & Comprehensive Capital Development Plan Update

### Expense obligations to the United States Army Corps of Engineers

The Kansas Water Office (KWO) administers the State’s Water Marketing, Water Assurance, and Water Supply Access programs which utilize federal reservoirs to help meet water supply needs. The State of Kansas has purchased storage space in fourteen United States Army Corps of Engineers (USACE) reservoirs. Water users, primarily municipal and industrial, must participate in one of the three programs to access water stored in these reservoirs. The obligation of expenses due to the USACE differs between the programs.

### Water Assurance Program

The members of an Assurance District are entirely responsible for the Principal and Interest (P&I) costs associated with the purchase of storage space and annual Operations and Maintenance (O&M) costs. Members are municipal and industrial water right holders downstream from reservoirs where the District has purchased storage. Membership is mandatory.

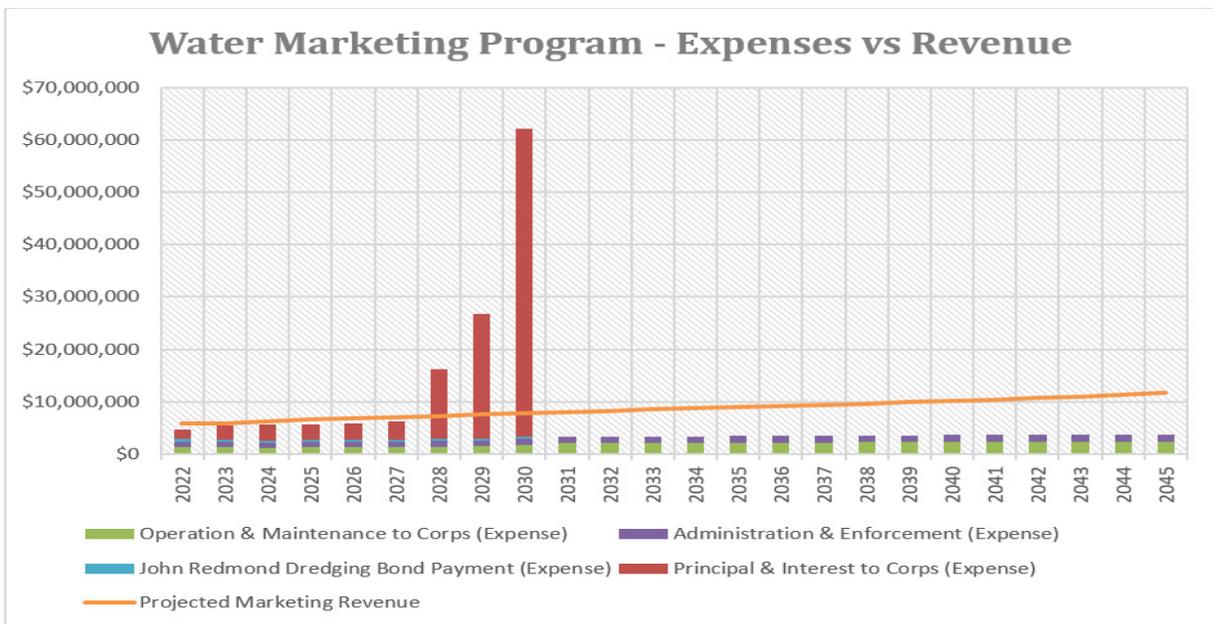
### The Water Supply Access Program

The members of an Access District are entirely responsible for the costs associated with P&I and O&M. The members are municipal, industrial, irrigation, and recreational water right holders downstream from reservoirs where the District has purchased storage. Membership is voluntary.

### Water Marketing Program

The Water Marketing Program is a wholesale raw water utility. Revenue is generated from the sale of water to municipal and industrial customers, typically through 40-year water purchase contracts. The water is sold at a cost per 1,000 gallons and the rate (\$) is set annually by the Kansas Water Authority. Program expenses are entirely the obligation of rate-paying customers. The chart below is intended to illustrate the need to restructure the debt service to the USACE associated with the program. Annual program revenue varies and is currently \$5 to \$6 million. P&I due to the USACE in the next 9 years is greater than \$110 million, primarily due in balloon payments in 2028, 2029, and 2030. Current capital debt (P&I) balance is approximately \$84 million and is in dire need of restructuring with bonding or funding assistance from the State.

In 2021, the KWO continued work to update the capital development plan, accounting for changes to marketing contracts and bonding options. The primary effort was toward debt restructuring scenarios with Kansas Development Finance Authority – an effort that will continue through 2022.



# Reservoir Water Supply & Sediment Management

## KWO Unfunded Liability & Comprehensive Capital Development Plan Update (cont.)

The capital expenses due to the USACE are associated with Clinton Lake, Hillsdale Lake, and Big Hill Lake as illustrated in the Water Marketing Program chart. There is also an unfunded liability associated with a portion of the contracted storage in Milford Lake and Perry Lake, a total current capital cost balance of about \$52 million. This storage is not currently committed to any of the three programs. The Kansas River Water Assurance District No.1 may purchase a small portion of the storage in Milford and Perry Lakes, but that is not anticipated in the near-term. This debt is a contractual obligation of the State of Kansas.

The table below summarizes the contractual obligations for these two reservoirs:

2021 Reservoir Water Supply & Sediment Management Accomplishments

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\$2.6 Million

**Reservoir Water Supply**

was utilized in 2021 to pay down additional principal balance associated with the state's water storage purchase contracts at Clinton and Hillsdale Lakes.

Reservoir	Contract Interest Rate	Contract Capital Costs Due Date	Balance on Due Date
Perry Lake	3.046%	2041	\$49.3 Million
Milford Lake	2.632%	2034	\$37.9 Million

Current projections indicate that the full demand for this storage in these two reservoirs is beyond the capital cost due date of the contracts. Due to the time gap created between due date of the contractual capital costs and the need for the storage based on projected customer demands, there is a need to develop a funding strategy for this specific liability.

In addition to the time gap mentioned above, there is also a potential to reallocate a portion of the subject storage in Milford and Perry to a water quality pool. Typically, USACE reservoirs with state-owned storage have a designated water quality pool to support downstream flow targets and water quality standards; however, there is currently no designated water quality pool in either Perry or Milford. Ownership and associated costs for water quality pools remains with the USACE, reducing the state's financial obligation, but would relinquish control of the storage to the USACE. As part of the Kansas River Reservoirs Flood and Sediment Study (with funding from KWO's Assessment and Evaluation Program) the KWO has, and will continue to, work with USACE to evaluate the potential reallocation of a portion of the storage in Milford and Perry. Alternatively, and maybe preferably, the State could make this capital investment of \$52 million now or \$87.2 million in the future to ensure that the storage is controlled by the state for the benefit of Kansans. Regardless of ownership or control, drought simulations of the Kansas River/Reservoir system model indicate that this storage is necessary to adequately meet in-stream flow requirements for Kansas River users.



# Water Quality Initiatives

## KWO Milford Lake Watershed Regional Conservation Partnership Program FY 2023 Request \$50,000 (No increase from FY 2022)

Through the Milford Lake RCPP, technical and financial assistance are available to agricultural producers to improve nutrient management, benefiting watershed health.

The Milford Lake Watershed RCPP is a collaborative effort to improve water quality in Milford Lake and upstream. The program is a result of a \$2.88 million award through the NRCS, used in collaboration with nearly \$3 million in partner contributions to improve water quality conditions in the watershed.

Nutrient runoff from agricultural practices within the Milford Lake watershed causes nutrient loading that contributes to aquatic conditions that promote formation of harmful algal blooms (HABs) in Milford Lake. This RCPP project through NRCS implements best management practices within the watershed to decrease nutrient runoff, thus decreasing the introduction of nutrient loading, which helps prevent the formation of HABs in Milford Lake.

Funding requested for this project would provide additional leveraging opportunities for nutrient reduction work within the Milford Lake watershed beyond the current term of this existing RCPP project.



## KDHE Watershed Restoration and Protection Strategy (WRAPS) FY 2023 Request \$1,000,000 (↑ \$269,116 from FY 2022)

The WRAPS Program contributes to the Kansas Nutrient Program Management Plan through the implementation of a voluntary targeted watershed-based program funded by the Clean Water Act 319 and SWP.

This program seeks citizen and stakeholder input and participation in identifying watershed protection issues and restoration needs, establishing watershed protection and restoration goals, developing 9-Element Watershed Plans to achieve established goals, and implementing fully developed plans.



**The WRAPS Program targets Best Management Practices for watershed restoration activities in impaired watersheds designated as high priority for implementation through Total Maximum Daily Loads.**

### 2021 Water Quality Initiatives Accomplishments

**\$2.16  
Million**

**Milford RCPP**  
dollars in total NRCS contractual financial assistance through FY 2021 for planned & completed practices across more than 9,500 acres.

**\$3.03  
Million**

**WRAPS**  
dollars in funding received in CWA Section 319 funding to help implement an Interseeder program in high priority watersheds.

KDHE 9-Element Watershed Plans identify and outline priority areas for BMP implementation as well as needed pollutant load reduction amounts to improve water quality and remove waterbodies from KDHE's 303(d) List of Impaired Waters. Current 9-Element Plans collectively serve and protect 45% of the state's total land surface (24,576,154 acres). This includes most watersheds draining into large federal reservoirs.

KDHE worked with the City of Wetmore and Glacial Hills RC&D to secure funding of \$3.5 million in FY 2021 to implement the interseeder program with agricultural service providers in WRAPS high priority watersheds.

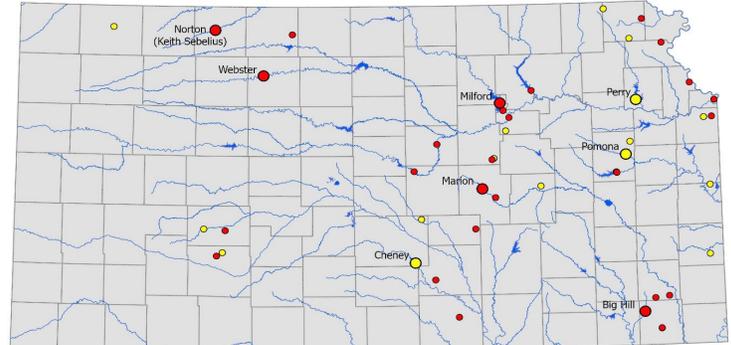
## Water Quality Initiatives

### ***KDHE Harmful Algal Bloom Pilot Project - FY 2023 Request \$150,000 (No increase from FY 2022)***

HABs can produce potent toxins that can cause human and animal illness or even death. The HAB mitigation pilot project investigates and demonstrates in-lake treatment options to reduce the frequency and duration of these blooms. The objective is to assess the effectiveness of such treatment options at minimizing the impact of HABs in Kansas public lakes.

Most of the \$150,000 appropriation is for investigation of algae blooms and evaluation of certain prevention and treatment options, such as nutrient control and peroxide algaecide application. Selection of strategies corresponds to the variety of lakes in the state, with current emphasis on Marion Reservoir and Milford Gathering Pond as model systems. Other public lakes in Kansas may be considered if appropriate to assess the scale of the demonstrations and if transferable to other lakes.

Public Lakes Confirmed with Harmful Blue-Green Algae Blooms (HABs) in 2021



Maximum Advisory Level:      ● Watch      ● Warning

Some of the activities this year included:

- Establishing in-lake sensors, and sampling for modeling nutrient dynamics that foster algal bloom development, in Milford Lake and Marion Reservoir.
- Expanding the capacity of the KDHE Laboratory to analyze for algal toxins, with anatoxin now being detected in addition to the typical microcystin detections associated with blooms.
- Investigating overwinter treatments to destroy resting cells in the sediments that provide a seed bank for blooms in the following growing season.
- Employing remote sensing and satellite imagery to track the emergence of algal blooms in moderate to large lakes in Kansas.

The goal is to evaluate the best mitigation practices throughout the United States and develop preferred long-term options for major reservoirs, along with appropriate recommendations for public lakes of varying sizes and scale.

**In 2021, 48 waterbodies/zones within the state of Kansas had Harmful Algal Bloom (HAB) advisories.**

### **2021 Water Quality Initiatives Accomplishments**

**11**

#### **Harmful Algal Bloom Pilot Project**

small ponds and farm ponds had barley straw bales installed to evaluate effectiveness at curtailing algae blooms.

### ***KDA Soil Health - FY 2023 Request \$100,000 (New from FY 2022)***

This new FY 2023 SWPF budget request by the KWA would provide resources to the KDA – Division of Conservation for soil health-related initiatives across Kansas. Funding would be utilized for soil health education and outreach activities. It could also be used to leverage other state, local, federal and/or private resources to advance the adoption of soil health practices and principles in priority areas to benefit surface and groundwater resources of Kansas.

## Water Quality Initiatives

### **KDHE Drinking Water Protection Program - FY 2023 Request \$800,000 (↑ \$450,000 from FY 2022)**

The Drinking Water Protection Program (DWPP) has two components.

- Ensure all Kansas communities have a clean, healthy, affordable drinking water source by planning and implementing strategies to prevent and mitigate contamination.
- Analyze the impacts of naturally-occurring minerals on water used for human consumption from private water wells in some Kansas regions.

There are currently nine communities actively participating in the DWPP program. The investigation needs of each Public Water Supply (PWS) vary depending on current monitoring capability and assessment needs. KDHE contracts with technical service providers to investigate the source water area. The average cost of an investigation ranges from \$20,000 to \$120,000. Investigation results will determine strategies and plans unique to the PWS needs. The average cost of completing a study ranges from \$100,000 to \$150,000 with the program. The DWPP continues to assess regional impacts of naturally-occurring minerals by concentrating work in northwest Kansas during FY 2021. (See pg 19.)



### **KDHE Contamination Remediation - FY 2023 Request \$1,088,301 (No increase from FY 2022)**

The Orphan Sites Program (OSP) in KDHE's Bureau of Environmental Remediation uses money from the SWPF for the assessment and remediation of contaminated sites where the responsible party is unknown or unable to undertake the necessary cleanup action. The purpose of this program is to protect human health while protecting the environment from the effects of hazardous chemicals or pollutants to soil, sediment, groundwater, surface water, or other natural resources of the state. Sites which pose the most serious threat to the public and the environment are remediated. There are currently 134 orphaned sites in the program.

### **KDA Water Resources Cost-Share FY 2023 Request \$2,698,289 (↑ \$450,000 from FY 2022)**

This program is administered by KDA-DOC and provides financial assistance to landowners for the establishment of conservation practices in the form of cost-share contracts. The primary goals are to prevent soil erosion, reduce sedimentation, reduce nutrients, pesticides, and fecal coliform bacteria in targeted public water supply reservoirs, as well as increase irrigation efficiency through irrigation technology initiatives.

Some of the most common practices are terraces and waterways, ponds, pasture and rangeland planting, filter strips, cross fencing, water wells and pumping plants. Irrigation technology such as automated soil moisture probes, mobile drip irrigation systems and remote monitoring systems are offered through special initiatives implemented by the DOC.

### **2021 Water Quality Initiatives Accomplishments**

200

**Drinking Water Protection Program**  
current PWS systems that show trends in increased nitrate or have occasionally violated the maximum contaminant level, and are a current focus of the program.

35

**Contamination Remediation**  
assessments, investigations or remediation occurred at contaminated sites.

90

**Water Resources Cost-Share**  
automated soil moisture probes approved for cost-share located in authorized Water Conservation Areas and the Rattlesnake Creek Priority Areas in the last two years.

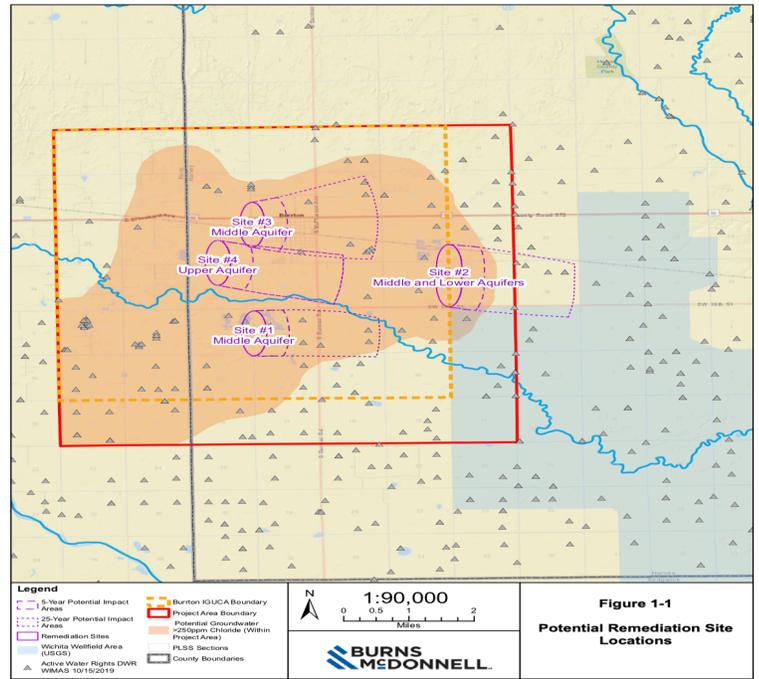
The funding appropriated in FY2022 and requested in FY2023 will continue to be utilized to implement practices aimed at reducing sedimentation and protecting and restoring water quality, in conjunction with the additional funds requested for water conservation through Irrigation Technology Initiatives.

# Water Quality Initiatives

## KWO Equus Beds Chloride Plume Project FY 2023 Request \$50,000 (↑ \$50,000 from FY 2022)

Groundwater in the Burrton area of western Harvey County continues to be impacted by elevated chloride concentrations, primarily caused by historic oil field operations in the region dating back to the 1930s. The plume of high chloride groundwater is expanding and migrating southeast in the Equus Beds Aquifer, threatening to impact a larger area of the aquifer which is used for municipal, industrial, and agricultural water supplies.

There was collaboration with KDHE on framework development for a pilot treatment project within the Equus Beds Aquifer to remediate the plume. Burns & McDonnell presented a final report in 2020 to demonstrate the most cost-effective way to utilize contaminated groundwater in the region, while protecting existing freshwater resources. The report identified extremely expensive options. Local engagement is taking place to find next steps utilizing the report recommendations.



Planning is being finalized to install additional monitoring wells in 2022 by the KCC; these wells will be maintained by GMD No. 2.

### KWO Produced Water Pilot Project

The Kansas Water Office previously secured a Bureau of Reclamation WaterSMART grant to help fund a project to address produced oil field water. This produced water is a by-product of oil production having a high chloride content along with other dissolved minerals and oil which is currently being injected into the Arbuckle formation. In partnership with Fisk/Neptune, the University of Kansas (KU) and the Kansas Water Office, equipment is being developed to treat produced water. The project site located in Barber County near Hardtner has a deep disposal well with chloride levels often measuring over 120,000 ppm.

A recent sample collected at the site had chlorides at 125,000 ppm and Boron at 17 ppm. These values need to be reduced to 250 ppm and 4 ppm, respectively, to meet stock water/irrigation requirements. Current requirements for human consumption limits are 250 mg/L for chloride and 2 mg/L for Boron. Anticipated delivery of equipment is spring of 2022. There will be a 60-day period during which the equipment will be operated and evaluated, after which KU will issue a final report. The report will also evaluate the potential to repurpose residuals such as chlorides to off-set the need to mine this material.

### 2021 Water Quality Initiatives Accomplishments

4

**Equus Beds Chloride Plume Project**  
potential remediation sites were identified in the 2020 final report. 78 domestic wells and water rights will be impacted by the Equus Bed Chloride Plume if not remediated.

1

**Produced Water Pilot Project**  
entity is constructing a piece of equipment that has the potential to impact the oil and gas industry, changing produced oil field water into potable water at the rate of 2,000 barrels/day.

## Water Quality Initiatives

### **KDA Non-Point Source Pollution Assistance - FY 2023 Request \$1,860,104 (↑ \$6,919 from FY 2022)**

This program is administered through the KDA-DOC and provides financial assistance to landowners for the establishment of conservation practices supported by the KWP. The primary goals are (1) water quality protection and restoration in watersheds with TDMLs, (2) information and education for adults and youth, and (3) other water quality issues.

Similar to the Water Resources Cost-Share program, appropriated funds are broken down into sub-categories and allocated to county conservation districts for KWP program implementation. In partnership with KDHE, funds are also directed to high priority watersheds for the restoration and protection of water quality.

Cover crops were added to the program this year and 95 county conservation districts participated in an on-farm trial initiative. This initiative allowed conservation districts to sponsor field trials that addressed a county-specific water resource issues. Doniphan County Conservation District (with assistance of NRCS) conducted three on-farm trials to evaluate if an increase to 12% slope creates effective conservation if certain practices are used such as: no till farming, crop rotation, and cover crops, etc.



### 2021 Water Quality Initiatives Accomplishments

10.5K+

**Non-Point Source Pollution Assistance**

acres were protected and 5,441 tons of soil saved in 2021. To date 154K+ tons of soil have been saved.

105

**State Aid to Conservation Districts**

county conservation districts were assisted by funds to effectively deliver local, state, and federal natural resource programs per the KWP.

Some of the practices implemented through the Non-Point Source Pollution Assistance Program include :

- Abandoned-well plugging
- Ponds
- Pasture and rangeland planting
- Cover Crop
- Cross fencing
- Livestock waste management
- Nutrient management grid sampling with variable rate fertilizer application

### **KDA State Aid to Conservation Districts - FY 2023 Request \$2,473,373 (↑ \$250,000 from FY 2022)**

The State Aid to Conservation Districts program provides funds that the KDA-DOC requests through the State Water Plan Fund budgeting process, for conservation district activities implementing local, state and federal programs identified in the Kansas Water Plan. The KDA-DOC requests up to \$25,000 per district of SWP funds to match the amount of funding provided each district by the county in which the district is located. K.S.A. 2-1907c.

Program funding is utilized by conservation districts to assist landowners in implementing the KWP, including best management practices that improve natural resources, as well as to provide information and education reaching all ages through field days, workshops, and school visits.



# Water Quality Initiatives

## KWO Arbuckle Study - FY 2023 Request \$150,000 (↑ \$90,000 from FY 2022)

At the request of Governor Kelly, an Arbuckle Study Group, representing a variety of state agencies and stakeholders, was formed and began meeting in 2020 with a goal of addressing fundamental data needs to characterize the Arbuckle's disposal and storage capabilities for continued long-term safe use. In FY 2020, \$68,000 in SWPF was appropriated late in the 2020 legislative session to initiate discussions and scoping of the Arbuckle Study.

In January 2021, the KGS was contracted to begin a study of Class II wells at which static fluid level, density, and bottom-hole pressure data could be acquired. Methodologies developed and implemented at these locations were to be evaluated to determine the accuracy and functionality of various measurement techniques for future routine acquisition of time-lapse data across a broader Arbuckle monitoring network. Unfortunately, difficulty identifying suitable sampling wells and obtaining consent for accessing privately owned wells has slowed progress in accomplishing key milestones. However, the KGS, with assistance from the Arbuckle Study Group, is continuing to pursue identification of, and access to, wells that would be suitable for data collection and that could lay the groundwork for the development of an expanded monitoring network capable of answering some of the basic questions in areas of high priority. Obtained data and analysis would provide guidance on appropriate actions needed to protect this valuable resource and its economic benefit to Kansans, and to address any associated seismicity and water quality risks.

**Governor Kelly created the Arbuckle Study Group, headed by the KWO, to obtain and evaluate data for determining risks associated with deep disposal within the Arbuckle formation.**

## Mineralization Studies

### Upper Arkansas Mineralization Study

The KWO continues to work with KDHE, KDA, KGS and Southwest KS Groundwater Management District No. 3 in a two-year study to collect current data on areas adjacent to the Arkansas River and surface irrigation canals on the declining quality of groundwater in Hamilton, Kearny, Finney, Gray, and Ford Counties in response to a legislative resolution passed in 2019. KDHE is analyzing the water samples and KGS is sampling additional water wells for lab analysis. KGS will combine the additional laboratory data with the first phase lab results to develop a report of findings. This study is funded through KWO Assessment and Evaluation Program.

### Northwest Kansas Mineralization Study

KDHE partnered with Fort Hays State University (FHSU) to conduct a two-year groundwater mineralization study in Northwest Kansas. In 2021, the focus was on private water wells located in the Prairie Dog River alluvium in Norton and Phillips Counties. The primary focus of the study is to identify uranium concentrations in the groundwater, but samples were tested for conductivity, sulfates, nitrates, chlorides, arsenic, manganese, selenium, iron, and uranium. FHSU sampled 31 domestic wells in 2021. Owners who have wells with mineral concentrations at or above the primary drinking water standards will be provided information regarding potential health effects, potential causes of the contaminant, and potential remedies. The Northwest Kansas Mineralization Study will continue through 2022 and is funded in part through the KDHE Drinking Water Protection Program.

## 2021 Water Quality Initiatives Accomplishments

8

### Arbuckle Study

county study area that will have a proposal from KGS for analysis of critical fluid data, assimilation of geologic, geophysical, & hydrological data significant to the Arbuckle.

31

### Mineralization Studies

domestic wells were sampled by Fort Hays State University in 2021 in the Northwest Kansas Study.



# Water Quality Initiatives

## ***KDHE Total Maximum Daily Load Program - FY 2023 Request \$380,738 (↑ \$100,000 from FY 2022)***

The Clean Water Act requires states to identify all water bodies where state water quality standards are not being met. Every two years, a list of impaired waters is submitted to the EPA for approval, utilizing water quality data associated with the KDHE targeted stream, biological and lake monitoring networks.



The waters listed in the Section 303(d) list require a TMDL. The TMDL sets a limit for the maximum amount of a contaminant that a water body can receive and still meet standards. TMDLs are developed consistent with Kansas' TMDL Prioritization Framework, which focuses on stream phosphorus and nitrate impairments and addresses the impaired water bodies. A variety of local, state, and federal programs utilize the 303(d) list and TMDLs to establish watershed restoration, protection, and funding priorities to address contributing pollutant sources.

A few updates from this past year include:

- Resurrected the lake and wetland program to sample 61 sites.
- Initiated a cooperative investigation into the source of bromide loads into the Kansas River that create disinfection byproduct complications for public water suppliers such as Water One, Lawrence and Topeka. This effort involves KDHE, KWO, the Kansas River PWS, KGS and USGS.

**KDHE met its TMDL Vision commitments to EPA for 2012-2022, covering 25% of Kansas with a nutrient (nitrate or phosphorus) TMDL and establishing 392 stream segments or lakes with TMDLs by 2022. KDHE also realized improvements and enhancements to reservoir sampling and biological data analyses in 2021.**

## **2021 Water Quality Initiatives Accomplishments**

# 531

### **TMDL Initiatives**

segments or lakes in Kansas have established TMDLs, with another 26 poised for approval.

## ***KDWP Aquatic Nuisance Species Program - FY 2023 Request \$224,457 (↑ \$224,457 from FY 2022)***

ANS are non-native species that threaten the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters.

ANS can diminish food supplies and degrade habitat for other species; reduce numbers and variety of desirable fish; reduce fishing, boating, and other recreational activities; lower property values and decrease quality of municipal water sources; foul water lines; clog intakes; burn out pumps; damage power generating facilities; and decrease water system efficiency, as well as increase the risk of flooding due to overcrowded biomass and clogging of lake outlets.



In 2005, the Kansas ANS Management Plan was created and established within KDWP. SWP funding for FY 2022 will allow the ANS program to expand watercraft inspection and decontamination activities, which will help prevent ANS introductions into currently uninfested waterbodies.

Some goals of the ANS Management Plan include: prevent introductions of ANS to Kansas; prevent dispersal of established populations of ANS into uninfested waters in Kansas; eradicate or minimize the adverse ecological, economic, social, and public health effects of ANS in an environmentally sound manner; educate all aquatic users of ANS risks and how to reduce the harmful impacts.

# Statewide Water Issues

## Quivira/Rattlesnake Creek

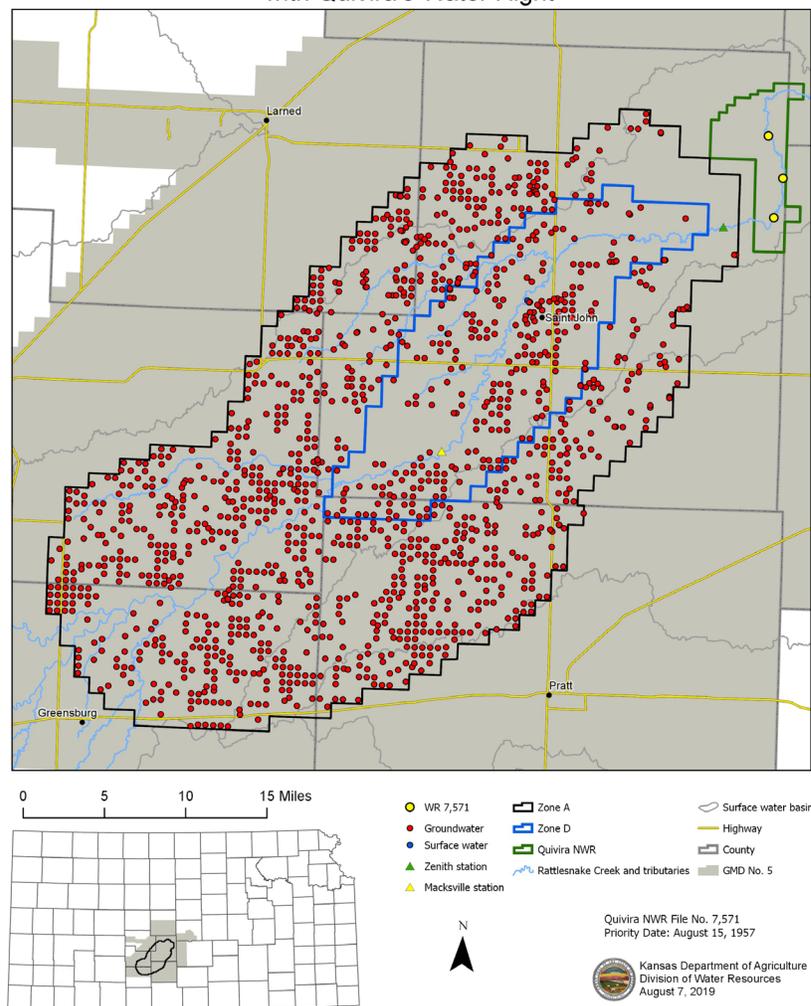
In Kansas, as in most western states, the date of a water right defines its relative priority. When there is not enough water to satisfy all rights, older (“senior”) rights are entitled to be satisfied before newer (“junior”) rights can use the same source of water. For decades, the U.S. Fish & Wildlife Service (USFWS) expressed concern that its senior water right on Rattlesnake Creek, held for the operation of the Quivira National Wildlife Refuge, was being impaired by reductions to Rattlesnake Creek streamflow caused by junior groundwater pumping.

In response to USFWS’s 2013 formal complaint, KDA-DWR investigated and in 2016 found that junior groundwater pumping impairs the senior right frequently and significantly prevents the refuge from getting the water to which it is entitled. After years of negotiations, the USFWS and GMD No. 5 agreed to pursue stream augmentation (pumping groundwater into the stream) as the primary way to address the impairment. Other strategies to help relieve the impairment included development of a water rights purchase program, a water rights relocation program, and a program to incentivize the removal of center pivot end guns within the district.

In December 2020, a \$725,000 grant was awarded to GMD No. 5 through the NRCS Watershed Protection and Flood Prevention Program (WPFPP) for the development of a watershed plan covering the Rattlesnake Creek Basin as one of the steps necessary for GMD No. 5 to begin fulfilling the terms of its agreement with the USFWS.

While local efforts to address the impairment continued to take shape, In January of 2021 the Audubon of Kansas (AOK) filed suit in federal court against the U.S. Department of the Interior alleging they had failed to protect the senior water rights belonging to the Quivira NWR. The lawsuit sought an injunction that would ensure the refuge has sufficient water supplies by ordering the defendants to protect the refuge and its water right. The litigation was dismissed in October. The AOK appealed the ruling dismissing the Feds but did not appeal the dismissal of KDA.

Points of Diversion under Junior Water Rights Found to be Interfering with Quivira's Water Right



In September 2021, GMD No. 5 secured a contract with a consulting firm to develop the augmentation plan and environmental assessment as required by the grant. GMD No. 5 expects to hold public meetings beginning in January 2022 and have the plan finalized by the end of 2022.

## Statewide Water Issues

### *Hays/Russell – R9 Ranch Water Transfer*

In 1995, the City of Hays purchased the R9 Ranch near Kinsley, KS, later selling an interest to the City of Russell. With this purchase, the cities own a cumulative water right authorization for irrigation use of approximately 7,700 acre-feet.

In 2015, Hays and Russell began the process to request permission to convert the water rights to municipal purposes and transfer the water. Based on a modeling analysis with the change application process, they have agreed to limit the quantity which could be diverted from those wells for municipal use to a 4,800 acre-feet average over 10 years, an amount they describe as sustainable on an annual basis. In 2019, following consideration of comments from local individuals and entities, including GMD No. 5, the Chief Engineer of KDA-DWR contingently approved the change applications submitted by Hays and Russell to convert the R9 Ranch irrigation rights to municipal use for the cities. In May 2019, the Water Protection Association of Central Kansas (WaterPACK) filed a request for judicial review of the contingent approval of the change application in Edwards County District Court where a legal ruling is still pending.



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### *Wichita Aquifer Storage and Recovery (ASR)*

The City of Wichita currently operates an ASR project which allows for the diversion of water from the Little Arkansas River during high flow periods, treatment of the diverted water to drinking water standards, then injection of the treated water into the Equus Beds Aquifer for later recovery and use. Through this process, the city accumulates recharge credits with KDA-DWR, allowing Wichita to subsequently withdraw this recharged water from the Equus Beds Aquifer in addition to their native water rights. With the recent recovery of the Equus Beds Aquifer in the Wichita wellfield area to near pre-development conditions, recharge activities were being hampered by limited space within the aquifer.



In March 2018, Wichita submitted to KDA-DWR a proposal for modifications to the conditions associated with Wichita’s existing Phase II ASR permits. The request included lower minimum index levels used to determine when Wichita can withdraw accumulated recharge credits, as well as authorization of a new type of credits. Under the proposal, Wichita would receive recharge credits for treating surface water diverted at its ASR Project on the Little Arkansas River and sending it directly to Wichita, and leaving previously injected recharge credit water in the Equus Bed Aquifer. Formal administrative hearings took place from 2018 though 2021. Public comments were accepted throughout that time. The presiding officer will issue a recommended ruling to the Chief Engineer of KDA-DWR. This recommended ruling is pending.

## Statewide Water Issues

### Republican River Update

After decades of legal conflict arising from violations of the Republican River Compact, Kansas received settlement funds from the both Nebraska and Colorado to resolve any disputes over past use of water. Funds are being used to implement water conservation projects, water use efficiency upgrades, water management plans by water right holders, and cost-share programs in the Republican River Basin.



#### **Republican River Water Conservation Project – Nebraska Fund \$3.5 million**

To enhance benefits through the full reach of the Lower Republican River, an Ad Hoc Board of Directors was selected to explore the concept of a Lower Republican Water Supply Access District to address irrigation water shortages further downstream during drought. The desire of the Board is to establish permanent storage in Harlan County Lake for timely release and delivery of water downstream and outside the boundaries of the Kansas Bostwick Irrigation District (KBID). This could provide much needed drought tolerance to 107 junior water right holders.

KBID is in the process of converting portions of their remaining open irrigation canals to a buried pipe system. As of FY 2021, KBID has completed five installments of the canal project, which included the elimination of a total of 14.77 miles of open irrigation canals. The first five installments have saved approximately 3,080 acre-feet of water annually. KBID also started progress on the automation of the Upper Courtland Canal from the diversion dam to the Lovewell Reservoir inlet.

#### **Republican River Water Conservation Project – Colorado Fund \$2 million**

Approximately \$137,000 was expended in 2020 for irrigation technology cost-share in the South Fork Republican River Basin, and to date, approximately \$211,000 has been allocated for the 2021 sign-up period. In October 2020, \$500,000 was sent to the Cheyenne County Conservation District for projects supporting improved water use efficiency and water conservation in the South Fork Basin. By leveraging these funds, along with other contributions, the Cheyenne County Conservation District was awarded RCPP funding through NRCS.

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### **Kansas-Colorado Arkansas River Compact Update**

One main feature of the Kansas-Colorado Arkansas River Compact (Compact) is that Kansas and Colorado share the benefits of John Martin Reservoir (JMR), on the Arkansas River about 60 miles upstream of the state line. Kansas has two JMR accounts that can be called upon to satisfy the surface water irrigation demands by six irrigation ditches in southwest Kansas.

Drought conditions in the Arkansas River Basin in both Colorado and southwest Kansas creates heavy demand on storage in JMR for the irrigation season. With drought conditions forecast to continue, it is anticipated surface water supplies will be limited, including water stored in JMR, resulting in greater demand and impact on groundwater supplies.

The Kansas-Colorado Arkansas River Compact Administration's 2021 annual meeting was in December. At the meeting Federal agencies and local water districts provided updates on last year's water operations and on current and future projects. Water quality continues to be a prominent issue among the states. Dry conditions have worsened the water quality issues in the basin. The states will continue to meet regularly to work on ways to improve water quality.

The Compact's Special Engineering Committee continues to review Colorado's request for a new multi-purpose account. One of the proposed purposes is to facilitate irrigation improvements in Colorado that have the potential to benefit water quality. The states have also been working to resolve long-standing compact issues such as apportioning flood flows and Pueblo Reservoir winter operations.

## Statewide Water Issues

### Missouri River Coordination

The Lower Missouri River extends from Sioux City, Iowa, to St. Louis, Missouri, draining thousands of square miles of rural and urbanized areas while also containing numerous federal and non-federal projects that provide varying levels of flood protection. The Missouri River set a new record of flow in the Lower Missouri River Basin in 2019.



As a result of the record-setting flooding in 2019, the states of Kansas, Iowa, Nebraska and Missouri partnered with USACE to begin the process of developing a comprehensive plan to evaluate solutions to lessen flood risk in the Lower Missouri River Basin. These planning efforts include input from local citizens who have been repeatedly impacted by flooding.

In 2021, the 4 states signed a formal Memorandum of Understanding designating the respective contribution amounts each would provide to the Lower Missouri River Flood Risk and Resiliency Study to comprise the total sponsor share in coordination with USACE. Kansas committed to contributing \$184,375; of this amount, \$10,000 was paid in 2021. Also, during 2021, the states were given the opportunity to comment on the accompanying draft PAS report. Various coordination meetings between the USACE and the state sponsors took place during 2021, including a milestone meeting with USACE headquarters to review the study progress and path forward.

#### **Flood Response Study - FY 2023 Request \$200,000 (↑ \$200,000 from FY 2022)**

The 2019 Special Legislative Committee on Flooding recommended funding for a basin-by-basin evaluation of flood risks in Kansas. In 2020, \$100,000 in funding from KWO's Assessment and Evaluation Program was appropriated for Flood Response Study efforts. In conjunction with this previously appropriated funding, the KWO is continuing efforts to leverage federal resources for completion of studies in flood prone areas of Kansas. Flood study efforts look to identify areas of recurring flooding, determine economic loss from these events, and identify potential mitigation projects that can lessen future flood damage.

In previous fiscal years, a portion of KWO's Reservoir & Water Quality Research was utilized for the development of a stand-alone flood inundation mapping tool by the Kansas Biological Survey, which will allow for real-time estimation of flooding and potential impacts. Additional funding in FY 2022 was utilized to continue support of these ongoing efforts.

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### Kansas River Reservoirs Flood and Sediment Study



River Reservoirs Flood and Sediment

STUDY

The Kansas River Basin includes 18 federal reservoirs, 12 of which reside in the State of Kansas, which regulate 85% of the drainage area in the basin, providing critical water supply, flood damage risk reduction, and vital river flow support to downstream regions. In an effort to more effectively manage those resources and improve overall understanding of the Kansas River Basin, the USACE, KWO, and KDWP launched the Kansas River Reservoirs Flood and Sediment Study in March 2019.

Study efforts have included planning discussions and stakeholder outreach to identify and define issues and opportunities, goals and objectives, and measures and strategies for the watershed. Additionally, assessments to evaluate existing conditions and projected future conditions without action in the watershed are underway for flood risk management, water management, sediment management, water supply, water quality, and biological resources. The Shared Vision Milestone was officially completed in June 2021. Future study milestones will include recommendations and, ultimately, a Watershed Study Report expected to be completed in 2024. The total cost of the study is \$3,000,000 including \$2,250,000 from USACE and \$750,000 in contributions from the State of Kansas.

## Statewide Water Issues

### Groundwater Recharge and Sustainability Project

The Groundwater Recharge and Sustainability Project (GRASP) project is now underway to build on the momentum achieved by existing water conservation efforts implemented in Wichita and Greeley counties to address declining aquifer levels within focused areas. The economic vitality and resiliency of communities such as Leoti and Tribune are dependent on a clean, sustainable water supply; however, over-appropriation and extensive over-use, primarily from irrigation, has caused severe depletion of the groundwater supplies within the area.



This project, as one of several active RCPP projects in the state, utilizes \$1.5 million in partner resources in conjunction with \$1.4 million in federal resources through USDA Natural Resources Conservation Service (NRCS) to help to provide technical and financial assistance opportunities for landowners within the project area to address the declining aquifer levels. Current project partners include local producers, the Kansas Association of Conservation Districts, the Kansas Dept. of Agriculture, the Kansas Department of Health and Environment, Kansas Department of Wildlife and Parks, Kansas Farm Service Agency, Kansas Groundwater Mgmt. District 1, Kansas NRCS, KWO, Wichita and Greeley Conservation Districts, Ducks Unlimited, Kansas Alliance for Wetlands & Streams, Pheasants Forever and Playa Lakes Joint Venture.



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### General Mills/KDHE/Cheney Lake Watershed Initiative

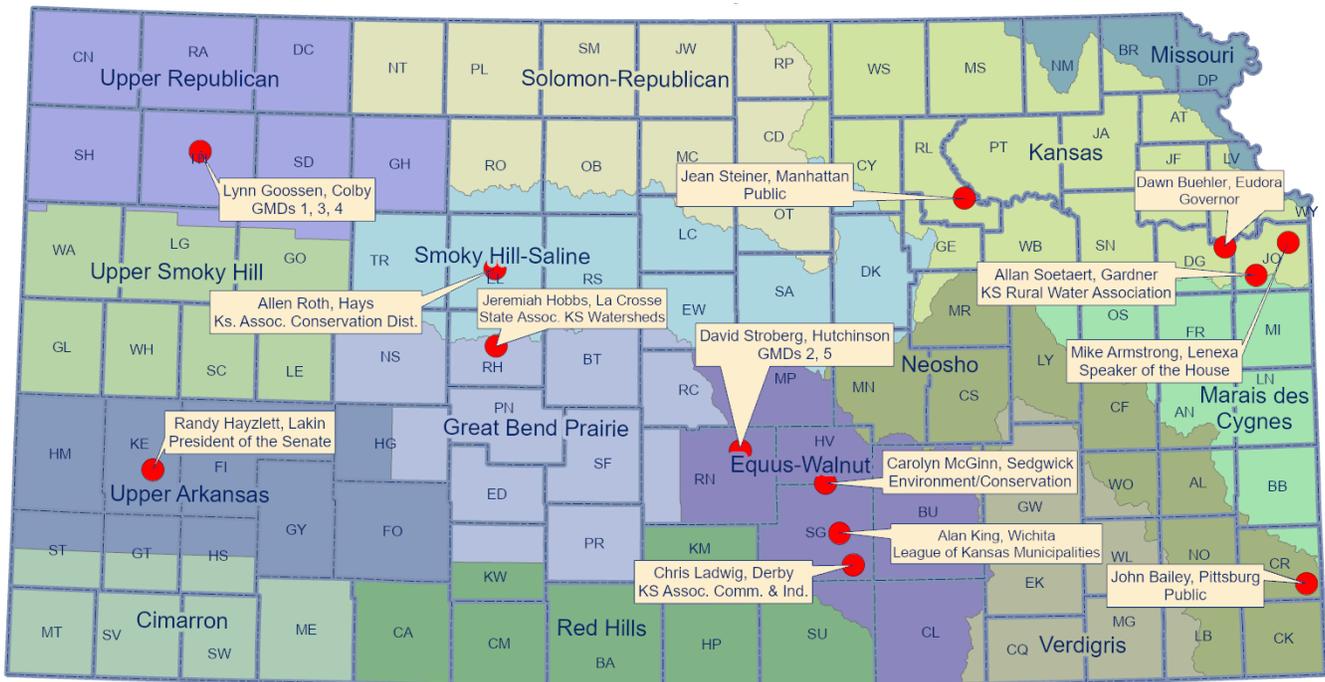
General Mills, with the help of KDHE, the Cheney Lake Watershed Incorporated and the Ecosystem Services Market Consortium, selected the 650,000-acre Cheney Reservoir region as the location to implement new technologies and management strategies to improve soil health, reduce nutrient runoff all while increasing yields.

The project involves 24 farmers in five counties; Kiowa, Reno, Pratt, Kingman and Stafford. Water from the reservoir where receiving runoff from these farms is used by residents of Wichita. These efforts are being driven by consumer demand for companies, producers and communities that demonstrate investments in environmentally sustainable practices and actions to reduce greenhouse gas emissions that contribute to the climate crisis.



This partnership is helping to enhance the sustainability of the agricultural ecosystem, as well as the natural ecosystem, encouraging farmers to implement regenerative agriculture practices. KDHE and General Mills are planning on quantifying and verifying both carbon and water quality credits to be purchased by industry and municipalities in future fiscal years.

## Kansas Water Authority Membership Map



Kansas Water Office  
November 2021

### Kansas Water Authority Ex Officio Members

- |  |  |  |   |
|--|--|--|---|
| Earl Lewis<br>Division of Water Resources<br>KS Dept. of Agriculture | Dr. Ernie Minton<br>Ag Experiment Station<br>KS State University | Andrew Lyon<br>Division of Conservation<br>KS Dept. of Agriculture | Rolf Mandel<br>KS Geological Survey             |
| Brad Loveless<br>KS Dept. of Wildlife, Parks & Tourism               | David Toland<br>KS Dept. of Commerce                             | Sara Baer<br>KS Biological Survey                                  | Leo Henning<br>KS Dept. of Health & Environment |
| Mike Beam<br>KS Dept. of Agriculture                                 | Connie Owen<br>KS Water Office                                   | Andrew French<br>KS Corporation Commission                         |   |

The Kansas Water Authority (KWA) consists of 13 voting members who are appointed by the Governor or Legislative Leadership. State agency directors serve as ex-officio members. KWA is statutorily within and part of the Kansas Water Office (KWO). The KWA is responsible for advising the Governor, Legislature and Director of the KWO on water policy issues, approving the Kansas Water Plan and making recommendations for funding and spending the State Water Plan Fund. The KWA also approves federal contracts, administration and regulations proposed by the KWO. The KWA provides the leadership to ensure that water policies and programs address the needs of all Kansans.

***Kansas faces water challenges in every corner of the state, many with potentially severe and far-reaching consequences. Comprehensive planning for water management, conservation and development of the state's water resources is more critical than ever before.***

## Notes



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