Kansas Water Authority Meeting
Wichita, Kansas
10:00 a.m. – December 19, 2018

Time	*Agenda Item*	*Presenter*	*KWA Advice*	*KWA Decision*	*Page No.*
10:00 am	**Call to Order/Introductions**	Gary Harshberger			
10:05 am	**Welcome**				
10:10 am	**Approval of Minutes of August 22, 2018**			X	2
10:15 am	**KWA PWS Committee**	Dennis Schwartz			4
	2019 Surplus Water Report	Cara Hendricks		X	--
10:35 am	**Federal Updates**	Cara Hendricks Ginger Harper			5
11:15 am	**KWA RAC Operations Committee**	Greg Graff			7
	RAC Membership	Matt Unruh		X	
	RAC Messages to the KWA	Matt Unruh		X	
	RAC Training	Matt Unruh	X		
12:00 pm	***Working Lunch Break***				
12:30 pm	**Interstate Water Management Fund**	Earl Lewis			13
12:45 pm	**Water Injection Dredging at Tuttle Creek Lake**	John Shelley	X		16
1:15 pm	**Vision Implementation Update**	Matt Unruh			--
	Kansas Reservoir Protection Initiative	Matt Unruh	X		
	2018 Harmful Algal Bloom Update	Leo Henning	X		
	2018 Water Technology Farm Update	Armando Zarco	X		
2:00 pm	**KWA Annual Report to the Governor and Legislature**	Matt Unruh/ Cara Hendricks		X	--
2:30 pm	**Non-Public Household Water Well Project**	Matt Unruh/Jack Brown	X		17
3:00 pm	**Director's Report**	Earl Lewis	X		--
3:15 pm	**New Business**				
3:30 pm	**Adjourn**				

Upcoming Kansas Water Authority Meetings: January 30-31, 2019, Topeka, KS

Minutes

KANSAS WATER AUTHORITY

August 22, 2018 **Manhattan, Kansas** **Regular Meeting**

CALL TO ORDER: Chairman Gary Harshberger called the **August 22, 2018** Kansas Water Authority meeting to order at **9:03** a.m. at the Kansas Dept. of Agriculture, Manhattan, KS

MEMBERS PRESENT: Gary Harshberger, Chairman; Mike Armstrong; John Bailey; Mark Fischer; Greg Graff; Randy Hayzlett; Alan King; Calvin Kissick; Brad Loveless; Karma Mason; Ted Nighswonger; Dennis Schwartz; Lynn Wobker; David Barfield; Rolfe Mandel; Susan Metzger; Ed Martinko; Leo Henning; Josh Roe/Jackie McClaskey; Rob Reschke; Sue Schlapp; Tracy Streeter; Steve Adams

MEMBERS ABSENT:

APPROVAL OF MINUTES:

Motion No. 08-22-01 It was moved by **Dennis Schwartz** and seconded by **Brad Loveless** the **April 18, 2018** Minutes for the Regular Meeting of the Kansas Water Authority be approved as presented. **Motion carried with no dissenting votes.**

It was moved by **Dennis Schwartz** and seconded by **Brad Loveless** the **July 20, 2018** conference call minutes of the Kansas Water Authority be approved as presented. **Motion carried with no dissenting votes.**

KWA/RAC OPERATIONS:

KWA RAC Committee-Membership

Greg Graff and Matt Unruh presented the Membership Report for approval

Motion No. 08-22-02 It was moved by **Greg Graff** and seconded by **Mark Fischer** to approve RAC membership items as presented, including appointment to the Smoky Hill-Saline RAC from Dan Baffa and the Upper Republican RAC from Scott Ross and Kenny Sanderson.
Motion carried with no dissenting votes.

RAC COMMITTEE UPDATES:

Great Bend Prairie **Berry Bortz** presented an update.

Neosho **Angela Anderson** presented an update.

Solomon-Republican **Don Hellwig** presented an update.

RESEARCH COORDINATION WORK GROUP:

Ed Martinko and Ted Harris presented on Harmful Algae Bloom.

Rolfe Mandel and Tony Layzell presented on Streambacnk Stabilization Effectiveness.

Susan Metzger presented on Water Efficient Crops & Irrigation Efficiency.

VISION AND WATER PLANNING:

Matt Unruh and Katie Goff presented on the State of the Resource

Matt Unruh presented on BMP Implementation.

Tracy Streeter presented on Water Technology Farms.

David Barfield presented on LEMA/WCA.

INTERSTATE ISSUES UPDATE:

Tracy Streeter presented.

DROUGHT UPDATE:

Tracy Streeter provided update.

CONSERVATION DISTRICT PRESENTATION:

Dan Meyerhoff, Kerri Harris and Stephanie Royer presented.

KWA BUDGET COMMITTEE:

It was moved by **Karma Mason** and seconded by **Brad Loveless** to adopt the State Water Plan Fund as presented, as well as full restoration of the State General Fund and Economic Development Initiatives Fund demand transfers. The KWA Budget Committee also recommends the KWA support additional agency staff requests as presented.

Motion carried with no dissenting votes.

DIRECTORS REPORT: Provided by **Tracy Streeter**

NEW BUSINESS:

UPCOMING MEETINGS: December 18-19, 2018 Wichita and January 29-30, 2019, Topeka

Adjournment The KWA adjourned at **4:35 p.m.**.

_____ _____

Gary Harshberger, Chairman Tracy Streeter, Secretary

MEMO

DATE: December 14, 2018
TO: Kansas Water Authority
FROM: Dennis Schwartz, Chair, Public Water Supply Committee
Cara Hendricks, P.E.
RE: Public Water Supply Committee Update

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Topeka, KS 66612
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Surplus Water Available in Water Marketing Program Lakes, Calendar Year 2019 (Surplus Water Report)
Approval of this report by the KWA gives the Director the permission to enter into contracts for water considered to be surplus during the calendar year. The Calendar Year (CY) 2019 Surplus Report includes the changes made annually to the report, with a few additional updates as noted below. Kansas Water Office staff provided the draft 2019 Surplus Water Report to the Committee at the Dec. 14th meeting for review. The draft report is included in the mailing materials.

The other changes include:

- Operational changes made to Milford's Lake Level Management Plan were incorporated into the model, resulting in a greater reduction in yield.
- Additional explanation of background and benefits for the Milford Lake Level Management Plan
- Addition of Toronto Lake to the report, estimating its surplus yield from available marketing storage.
- New pending application added to the Council Grove Lake page. The City of Council Grove submitted a Water Marketing Contract Application on December 6, 2018 for an annual quantity of 175 MGY.

The Public Water Supply Committee recommends that the Kansas Water Authority approve the Surplus Water Available in Water Marketing Program Lakes, Calendar Year 2019 report and authorize the Director to enter into surplus water supply contracts for water defined to be surplus by the report.

City of Lawrence Water Marketing Contract Update
Contract negotiations are ongoing between the Kansas Water Office and the City of Lawrence. The City's current capped rate contract expires on December 29, 2019. It is anticipated that a draft contract will be ready for review and discussion at the January KWA meeting.

Corps of Engineers' Notice Regarding Changes to O&M Billing for Water Supply Storage Purchase Agreements
In October, the Corps of Engineers Tulsa District notified the Kansas Water Office that the Corps had discovered an error in the billing related to O&M costs associated with the state's water supply storage purchase agreements. The letters (one for each water supply storage purchase contract) indicate that the Corps has not been billing the state in accordance with the agreements, specifically with regard to "Major Repair, Rehabilitation and Replacement" (RR&R) costs.

The letters included projected annual O&M costs for the next 5 years, as well as projected costs specifically identified as RR&R, which are defined as costs associated with infrequent work that is non-recurring in nature and serves to extend the useful life of the reservoir. The percentages of the costs for which the state is obligated to pay for O&M and RR&R projects can vary depending on the individual purchase agreement, and unlike annual O&M costs, some of the agreements allow RR&R to be amortized. Additionally, the Corps indicated that it is conducting an internal review of historical costs associated with the agreements that are "not previously captured and not billed". The KWO has engaged with legal staff regarding this information, and will continue to update the PWS Committee. At this time, the KWO is still awaiting similar letters from the Corps Kansas City District for the associated agreements.

This item is for information only. No action is needed at this time.

Surplus Water Available in Water Marketing Program Lakes Calendar Year 2019

December 2018

Kansas Water Office

Table of Contents

Introduction

Surplus water is defined as waters within the conservation water supply capacity committed to the State, but not required to meet contractual requirements. Water in this storage may be sold under short term contracts if it is found to be surplus, is determined to be in the public interest, and if the contract will advance the purposes of the State Water Resource Planning Act.

This report for Calendar Year 2019, as approved by the Kansas Water Authority, constitutes the finding that the waters so indicated in the report are surplus (IPM-12).

The report will be used as guidance to the Director of the Kansas Water Office in contracting for surplus waters for calendar year 2019. The surplus yield identified in this report is a starting point in determining whether the Office should enter into a surplus water marketing contract. At the time an application for a surplus contract is submitted, the Director will also consider:

- Pending applications that are actively being pursued by an applicant which may result in water being committed to a user in the near future
- The impact of the adopted lake level management plan
- The existence of drought conditions and the effect of the drought on water in storage
- Any other information that could be used in the determination of the public interest.

Surplus Water Available in 2019

Statute limits the amount of water that can be provided as surplus water in any one calendar year to 10% of the water supply yield capability, unless the Governor has declared an emergency which affects the public, health, safety or welfare. Surplus Yield is the yield associated with water supply storage that is in service and is not committed to another user for that year. The Surplus Yield Available is equal to either the surplus yield or 10% of the water supply yield, whichever value is smaller.

Summary Table

	Water Supply Yield		**Surplus Yield Available in 2019**	
Lake	mgd	Af/yr	mgd	Af/yr
Big Hill (Pearson-Skubitz)	8.0	8,965	0.80	896
Clinton	18.3	20,533	0.00	0
Council Grove	8.4	9,363	0.84	936
Elk City	13.9	15,623	1.39	1,562
Hillsdale	15.5	17,381	0.00	0
John Redmond	32.0	35,851	3.2	3,585
Kanopolis	8.1	9,051	0.81	905
Marion	5.1	5,755	0.51	575
Melvern	8.7	9,739	0.87	974
Milford	108.1	121,173	0.00	0
Perry	68.0	76,168	0.00	0
Pomona	7.9	8,847	0.79	885
Toronto	4.7	5,238	0.11	122
Tuttle Creek	174.6	195,692	17.5	19,569

Explanation of Yield Changes from CY 2018 Surplus Report

The primary difference between the water supply yields of this report and the previous year's report is due to the application of an additional year of sediment accumulation in each reservoir. The annual sedimentation rate at each reservoir is published online by the Kansas Water Office and establishes the annual volumetric reduction to the reservoirs listed in this surplus report. In addition to the impact of annual sediment accumulation on yield, operational changes can impact yield. A real-world operational change to Milford's Lake Level Management Plan was incorporated into the model, resulting in a greater reduction in yield. Toronto Lake has been added to the report, with surplus yield being available from its marketing storage. The changes from 2018 to 2019 are summarized in the table below.

Yield Changes From 2018 Surplus Report

Lake	2018 Yield (MGD)	2019 Yield (MGD)	% Change from 2018	Comment
Big Hill (Pearson-Skubitz)	8.0	8.0	-0.2%	
Clinton	18.4	18.3	-0.2%	
Council Grove	8.4	8.4	-0.3%	
Elk City	14.1	13.9	-0.9%	
Hillsdale	15.5	15.5	-0.1%	
John Redmond	32.2	32.0	-0.7%	
Kanopolis	8.2	8.1	-0.9%	
Marion	5.2	5.1	-0.6%	
Melvern	8.7	8.7	0.0%	
Milford	111.1	108.1	-2.7%	LLMP impact
Perry	68.5	68.0	-0.8%	
Pomona	7.9	7.9	-0.6%	
Toronto	---	4.7	---	Toronto added to report
Tuttle Creek	176.2	174.6	-0.9%	

Yields units are million gallons/day (MGD)

Drought Condition Contingency

The Kansas Water Office has the statutory responsibility to advise the Governor on drought conditions and coordinates the Governor's drought response team. The Drought Monitoring Program collects climate data from a variety of sources, monitors drought activities and publishes a drought report during periods of drought. **The impact of drought conditions on reservoir storage will be evaluated at the time a surplus contract is being considered. Prior to entering into a surplus contract, the Kansas Water Office will review current drought conditions, declarations and forecasts. Conditions that may warrant declining a new surplus contract include: extended below normal precipitation; below normal streamflow in the river basin; concern about percent of storage remaining in the conservation pool and low probability of refill based on historic record**.

Explanation of Reservoir Tables

Table 1 - Conservation Storage Break Out

Table 1 for each reservoir separates the conservation storage into various components. The conservation storage is used for multiple purposes, which are identified in Table 1 and the pie charts as Water Quality, Other/Local and Water Supply.

The Water Quality pool is utilized to make established minimum releases which are intended to maintain flow in the stream below the lake. The Corps retains ownership of this storage.

The Other/Local pool includes storage that has been contracted by the Corps of Engineers to a local water supplier and storage that has been retained by the Corps of Engineers.

The Water Supply pool includes the amount of storage the State has under contract to serve the needs of municipal or industrial users' long term needs. The Water Supply pool is further divided into an In Service portion and a Future Use portion. Some of the water supply contracts between the Corps of Engineers and the Kansas Water Office allow the State to defer payment on storage until the storage is needed. When the storage is being paid for it is considered In Service. The Corps of Engineers retains ownership of the Future Use storage until the State calls that storage into service.

The In Service water supply is then further divided by how that storage has been and is being paid for. Water Marketing is the amount of committed storage to serve the customers of that program. Water Assurance is the amount of storage owned by the municipal and industrial users below lakes that have formed an assurance district. The Reserve Capacity is storage the State purchased in the mid 1990's under the 1985 Memorandum of Understanding (MOU) between Kansas and the U.S. Army Corps of Engineers. This portion of storage has not yet been needed for either the Water Marketing or Water Assurance programs. Annual operation and maintenance costs of the Reserve Capacity are paid by the State Water Plan Fund.

Table 1 provides the break out of the conservation storage in percentage of the current total conservation pool and in current estimated acre-feet, which is based on a projection using the most recent sediment survey adopted by the Corps of Engineers. The amount of water the water supply storage can yield during a 2% drought is also provided. The drought from 1952 through 1957 is defined in regulations as a 2% drought.

Table 2 - Contracted Quantities

Table 2 lists data associated with existing water marketing contracts for each lake. Table 2 provides the annual maximum quantity of water for each contract as well as the amount of water committed to each customer in 2018. Statute allows for a contract holder to negotiate a contract for an amount of water which gradually increases over time. The difference between the 2019 maximum quantity and the annual maximum quantity is a portion of the water available for surplus.

Table 3 - Pending Applications

Table 3 lists pending applications for water marketing contracts for each lake. The Water Marketing Program allows applications to remain on file for up to 13 years without beginning negotiations for a contract. Thus, some applications will not result in long term contracts in 2019. This information will be reviewed by the Director at the time a surplus application is submitted.

Table 4 - Past Surplus Contracts

Table 4 lists the surplus water marketing contracts for the past two years for each lake.

Table 5 - Surplus Yield

This table lists the yield that is determined to be surplus in 2019. Storage owned by a water assurance district and water committed to a water marketing customer in 2019 is not available for surplus contracts. Thus, the yield committed through marketing contracts and the yield associated with the portion of the Water Supply pool owned by a water assurance district is subtracted from the estimated 2019 yield. Additionally, the portion of the Water Supply pool considered Future Use Storage is controlled by the Corps of Engineers and is not available for a surplus water marketing contract. When there is Surplus Yield, the amount of Surplus Yield Available for use during the calendar year is limited to 10% of the Current Yield or the calculated Surplus Yield, whichever is less.

Calculation of Surplus Yield Available (*example*):

	mgd	AF/yr	
	10	11,201	Current Yield
-	2	2,240	Marketing Contracts
-	3	3,360	WAD Storage Yield
-	3	3,360	Future Use Yield
	2	2,240	Surplus Yield
	1	**1,120**	**Surplus Yield Available**

Lake Level Management Considerations

The Kansas Water Office is charged by the State Water Planning Act with negotiating and entering into agreements with the Corps of Engineers and the Bureau of Reclamation regarding operation or releases of water from federal projects. Seasonal lake levels are developed annually and are known as Lake Level Management Plans. Development of these plans includes public and stakeholder input. They are intended to increase the benefits to recreational users and improve wildlife and aquatic habitat while protecting the flood control, water supply and water quality purposes of the lake. It is important to note that the plans are developed for average climate conditions.

Most plans include additional flood storage for high springtime flows but flood operation procedures are followed as specified in the regulation manual. Drought conditions may also warrant deviation from the plan. Large volumes of water are stored or evacuated as the seasonal pool elevation changes. Protection of water supply storage is essential and statutory limitations are in place for this purpose. Water from the water quality and water supply pools may be evacuated during a lake level operation; however, the amount of water evacuated from the water supply pool under a lake level management operation is limited to the surplus yield available.

Internal Policy Memorandum #12

KANSAS WATER AUTHORITY
901 South Kansas Avenue, Topeka, KS 66612-1249 (785) 296-3185

Steve Irsik, Chairman
5405 Six Road, Ingalls, KS 67853
(620) 335-5363 - steve@ucom.net

IPM-12
Adopted April 7, 2006

MEMORANDUM OF INTERNAL POLICY

Disposal of Surplus Water in the State's Conservation Water Supply Capacity

Background

The Kansas Water Authority shall authorize the director of the Kansas Water Office to dispose of water when the Authority finds

1. the water is determined to be surplus,
2. it is in the public interest to dispose of the water, and
3. such disposal will advance the purposes of the State water resource planning act.

Surplus water is defined as waters within the conservation water supply capacity committed to the State, but not required to meet contractual requirements. K.S.A. 82a-1305(b) addresses disposal of surplus water.

82a-1305. (b) Whenever the authority finds that it is in the public's interest and will advance the purposes set forth in this act and in article 9 of chapter 82a of Kansas Statutes Annotated, and amendments thereto, the authority shall authorize the director to dispose of waters found by the authority to be surplus waters. Any arrangement for the disposition of any such surplus waters shall not be subject to the provisions of K.S.A. 82a-1306, 82a-1307 and 82a-1308a, and amendments thereto, relating to long-term contracts. No such arrangement shall be made for a period of time in excess of one year nor shall any such arrangement dispose of water from the conservation water supply capacity in excess of 10% of the yield capability as computed pursuant to subsection (a) unless the governor has declared that an emergency exists which affects the public health, safety or welfare. No charges shall be levied on the disposition of surplus waters when the purpose for such disposition is streamflow maintenance or reservoir pool management. A charge at a rate not to exceed the rate established pursuant to K.S.A. 82a-1306, and amendments thereto, shall be levied on the disposition of surplus waters when the purpose of such disposition is the maintenance of public health. A charge at a rate that may exceed the rate established pursuant to K.S.A. 82a-1306, and amendments thereto, shall be levied on the disposition of surplus waters when the purpose for such disposition is other than streamflow maintenance, reservoir pool management or maintenance of public health. History: L. 1974, ch. 452, § 5; L. 1976, ch. 441, § 2; L. 1977, ch. 358, § 1; L. 1983, ch. 343, § 4; L. 1984, ch. 382, § 2; L. 1986, ch. 396, § 4; July 1.

Process and Criteria

At the last Kansas Water Authority meeting of each calendar year, the Kansas Water Office will report to the Authority the following:

1. available surplus water within the State's water conservation storage capacity by reservoir for the following calendar year,
2. pending applications and on-going negotiations of water marketing contracts,
3. anticipated uses of the surplus water, including anticipated water marketing surplus contracts, streamflow maintenance needs and lake level management plans, and
4. assessment of any drought that may be occurring in the State and potential impacts of the drought on storage.

Approval of the report by the Authority will constitute a finding that the waters so indicated in the report are surplus, that it is in the public interest to dispose of the surplus waters, and disposal will advance the purposes of the State water resource planning act. The report will guide the director of the Kansas Water Office in disposing of surplus waters for the following calendar year, including entering into surplus water marketing contracts.

Because the yield capability of each reservoir's water conservation storage, referred to in K.S.A. 82a-1305(a), is projected into the future forty years per K.A.R. 98-5-8(a)(4) and the annual report of disposal of surplus water will utilize yield data associated with the following calendar year, the disposal of surplus water will be limited to the amount of storage that allows 90% of the "yield capability as computed pursuant to subsection (a)" to remain in storage for the following calendar year.

Date: June 2, 2006

Steve Irsik, Chairman
Kansas Water Authority

Reservoir Specific Tables

Big Hill Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	814 - 858	Flood Pool Elevation (ft msl)	858 - 867.5

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	0.00%	0	0
Other/Local	0.00%	0	0
Water Supply	100.00%	8.0	22,280
Future Use	64.20%	5.1	14,304
In Service	35.80%	2.9	7,976
Water Marketing	35.80%	2.9	7,976
Assurance District	0.00%	0	0
Reserve Capacity	0.00%	0	0

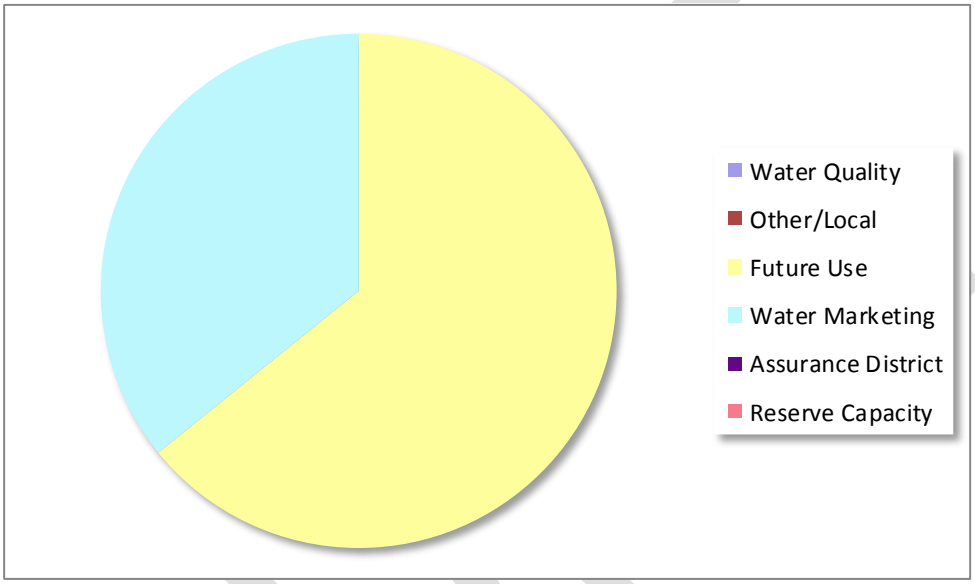


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
98-1	Public Wholesale Water Supply Dist. No. 4	4/17/2038	454,700,000	1,395	454,700,000	1,395
			454,700,000	1,395	454,700,000	1,395

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				
				0

Table 5: Surplus Yield

mgd	AF/yr	
8.0	8,965	Current Yield
1.2	1,395	Marketing Contracts
0	0	WAD Storage Yield
5.1	5,755	Future Use Yield
1.6	1,814	Surplus Yield
0.80	**896**	**Surplus Yield Available**

Lake Level Management Consideration

No Lake Level Management Plan was prepared for Big Hill for Water Year 2019.

Clinton Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	840 - 875.5	**Flood Pool Elevation (ft msl)**	875.5 - 903.4

	Break Out of Conservation Storage	**Current Yield (mgd)**	**Current Storage (acre feet)**
Water Quality	19.20%	0	22,181
Other/Local	0.00%	0	0
Water Supply	80.80%	18.3	93,344
Future Use	32.30%	7.3	37,314
In Service	48.50%	11.0	56,029
Water Marketing	48.50%	11.0	56,029
Assurance District	0.00%	0	0
Reserve Capacity	0.00%	0	0

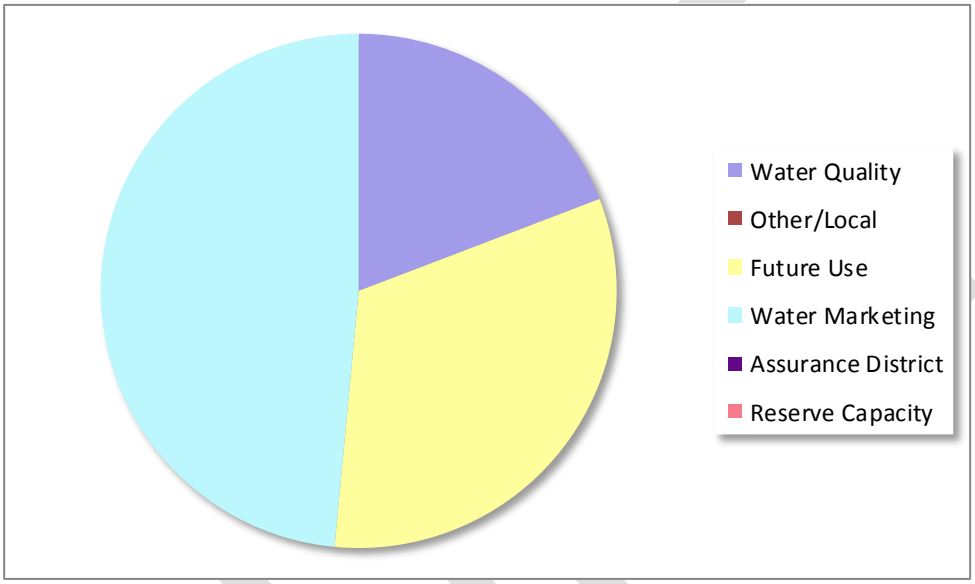


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
77-1	City of Lawrence	12/29/2019	3,468,957,286	10,646	3,468,957,286	10,646
77-2	Douglas County Rural Water District No. 5	12/29/2019	45,620,891	140	45,620,891	140
77-3	City of Baldwin City	12/29/2019	323,128,999	992	323,128,999	992
77-4	Douglas County Rural Water District No. 1	12/29/2019	47,516,490	146	47,516,490	146
77-5	Douglas County Rural Water District No. 4	12/29/2019	68,431,337	210	68,431,337	210
79-1	Douglas County Rural Water District No. 3	12/13/2021	684,273,174	2,100	684,273,174	2,100
79-2	Douglas County Rural Water District No. 6	12/13/2021	23,759,981	73	23,759,981	73
90-1	Douglas County Rural Water District No. 1	1/1/2031	14,258,172	44	14,258,172	44
90-2	Douglas County Rural Water District No. 6	1/1/2031	9,503,298	29	9,503,298	29
90-3	Douglas County Rural Water District No. 2	1/1/2031	80,782,250	248	80,782,250	248
90-5	City of Lawrence	1/1/2031	1,387,481,489	4,258	1,387,481,489	4,258
95-2	Douglas County Rural Water District No. 4	10/26/2035	105,488,095	324	105,488,095	324
95-3	Douglas County Rural Water District No. 5	10/26/2035	128,298,541	394	128,298,541	394
			6,387,500,003	19,603	6,387,500,003	19,603

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
City of Lawrence	11/30/2027	4,857,000,000	14,906

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

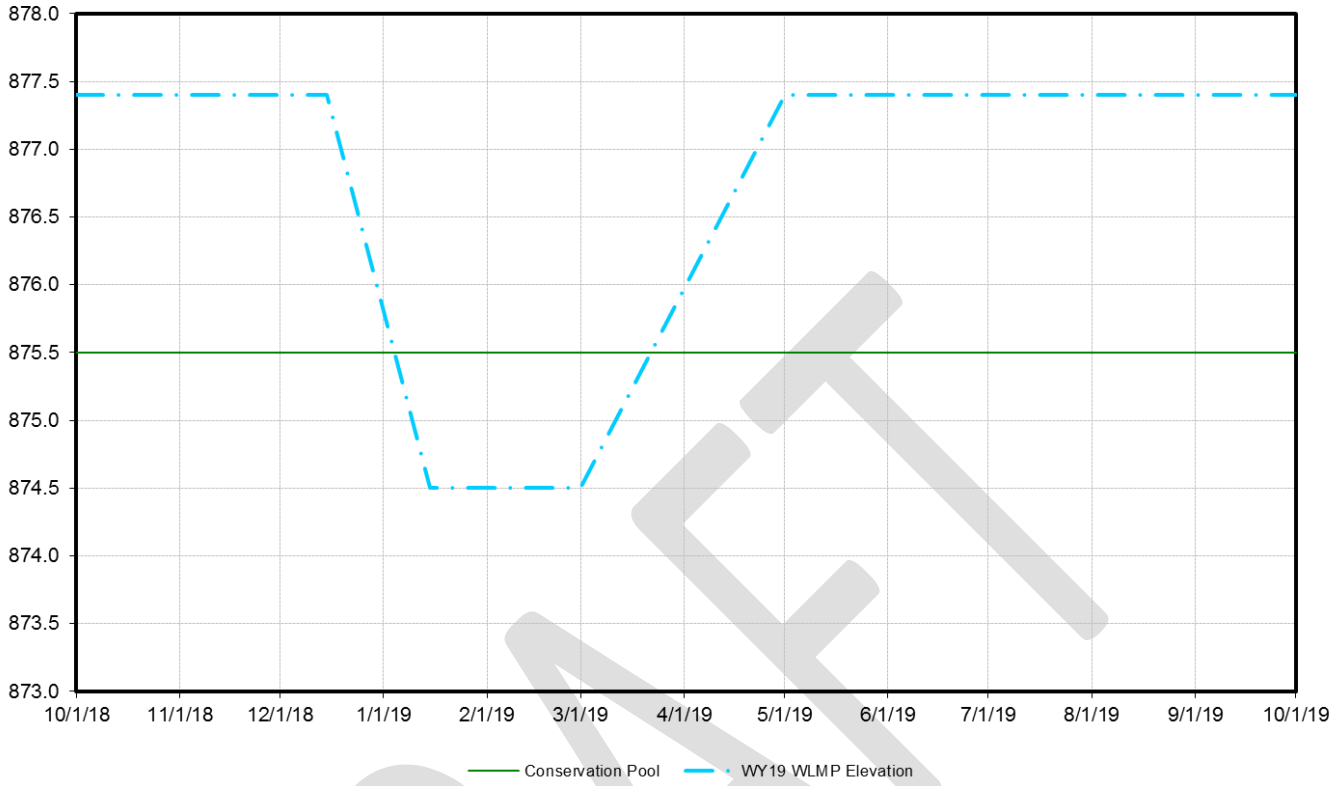
mgd	AF/yr	
18.3	20,533	Current Yield
17.5	19,603	Marketing Contracts
0	0	WAD Storage Yield
7.3	8,208	Future Use Yield
0.0	0	Surplus Yield
0.0	**0**	**Surplus Yield Available**

Lake Level Management Consideration

According to the Lake Level Management Plan, pool level may be lowered in January (or prior to freezing). The minimum lake level in this plan does not require disposition of surplus water.

Clinton Lake

Conservation Pool = 875.5 Flood Pool (FP) = 903.4 5% into FP = 877.4



Council Grove Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	1240 - 1274	Flood Pool Elevation (ft msl)	1274 - 1289

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	22.67%	0	9,481
Other/Local	0.00%	0	0
Water Supply	77.33%	8.4	32,340
Future Use	0.00%	0.0	0
In Service	77.33%	8.4	32,340
Water Marketing	43.43%	4.7	18,163
Assurance District	14.80%	1.6	6,190
Reserve Capacity	19.10%	2.1	7,988

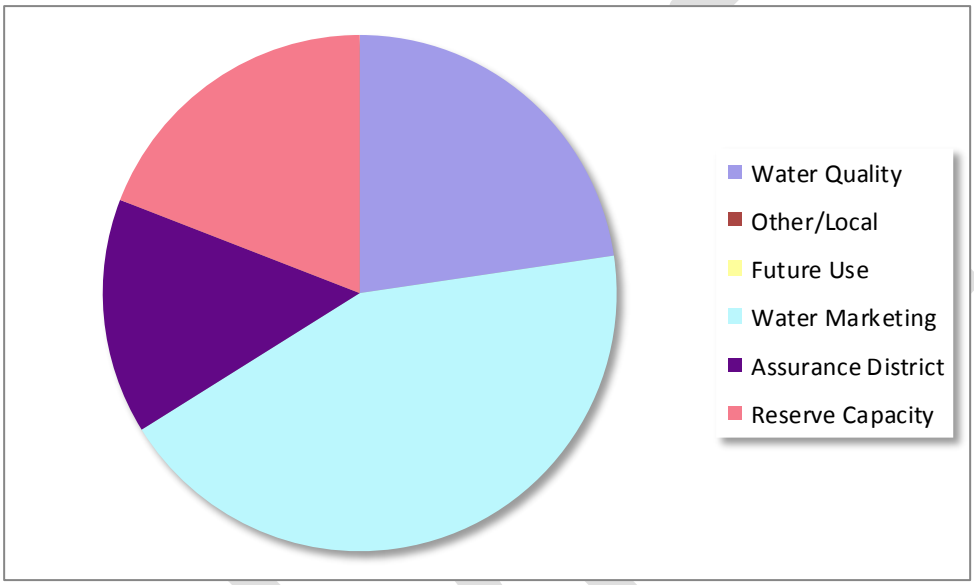


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
81-2	City of Emporia	10/21/2023	1,095,000,000	3,360	1,095,000,000	3,360
93-4	City of Council Grove	9/13/2033	30,000,000	92	150,000,000	460
			1,125,000,000	3,452	1,245,000,000	3,820

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
City of Council Grove	12/6/2028	175,000,000	537

Table 4: Past Surplus Contracts

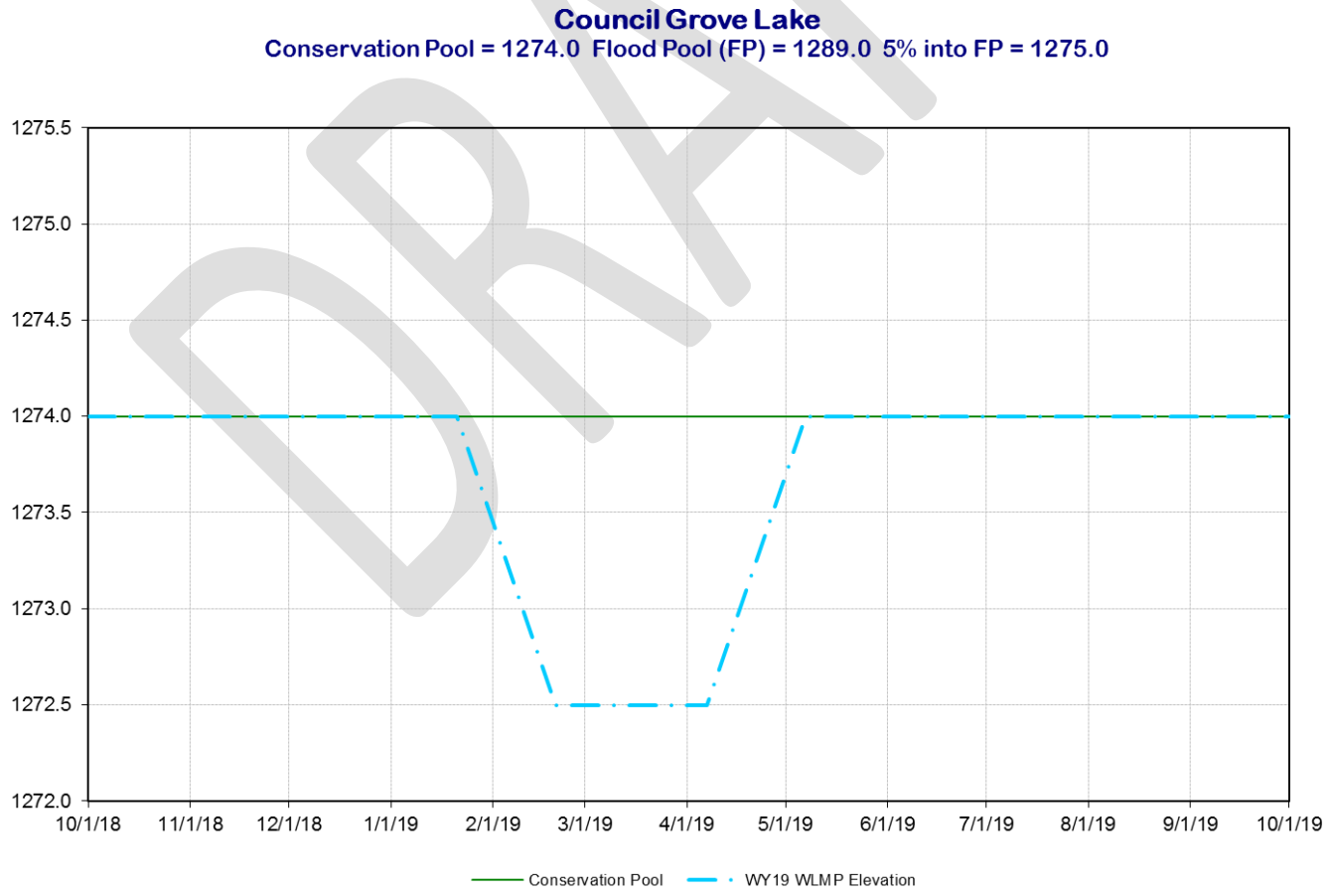
Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
18-01	Tom J. Moxley	12/31/2018	25,000,000	77
18-02	D. Randall Heilman	12/31/2018	14,112,000	43

Table 5: Surplus Yield

mgd	AF/yr	
8.4	9,363	Current Yield
3.1	3,452	Marketing Contracts
1.6	1,792	WAD Storage Yield
0.0	0	Future Use Yield
3.7	4,119	Surplus Yield
0.84	**936**	**Surplus Yield Available**

Lake Level Management Consideration

According to the Lake Level Management Plan, pool level may be lowered in January (or prior to freezing). The minimum lake level in this plan does not require disposition of surplus water.



Elk City Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	764 - 796	Flood Pool Elevation (ft msl)	796 - 825

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	14.08%	0	4,866
Other/Local	0.00%	0	0
Water Supply	85.92%	13.9	29,694
Future Use	0.00%	0.0	0
In Service	85.92%	13.9	29,694
Water Marketing	57.45%	9.3	19,854
Assurance District	0.00%	0.0	0
Reserve Capacity	28.47%	4.6	9,839

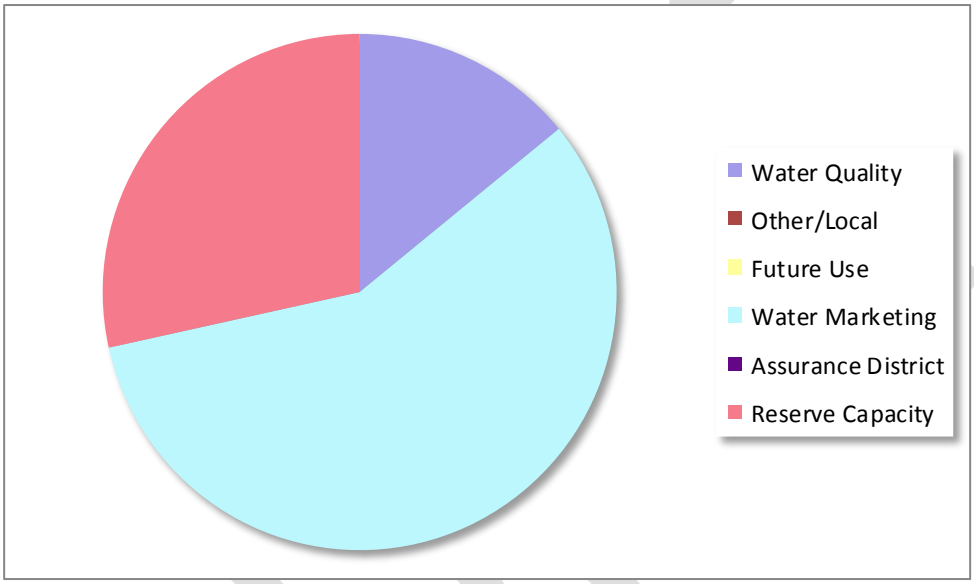


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
81-5	City of Coffeyville	12/16/2023	300,000,000	921	300,000,000	921
99-5	Coffeyville Resources	12/3/2039	608,000,000	1,866	608,000,000	1,866
12-7	Coffeyville Resources	8/9/2051	400,000,000	1,228	400,000,000	1,228
			1,308,000,000	4,015	1,308,000,000	4,015

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
13.9	15,623	Current Yield
3.6	4,015	Marketing Contracts
0.0	0	WAD Storage Yield
0.0	0	Future Use Yield
10.4	11,608	Surplus Yield
1.39	**1,562**	**Surplus Yield Available**

Lake Level Management Consideration

No Lake Level Management Plan was prepared for Elk City for Water Year 2019.

Hillsdale Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	850 - 917	Flood Pool Elevation (ft msl)	917 - 931

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	22.06%	0	16,718
Other/Local	0.00%	0	0
Water Supply	77.94%	15.5	59,066
Future Use	53.26%	10.6	40,360
In Service	24.68%	4.9	18,706
Water Marketing	24.68%	4.9	18,706
Assurance District	0.00%	0.0	0
Reserve Capacity	0.00%	0.0	0

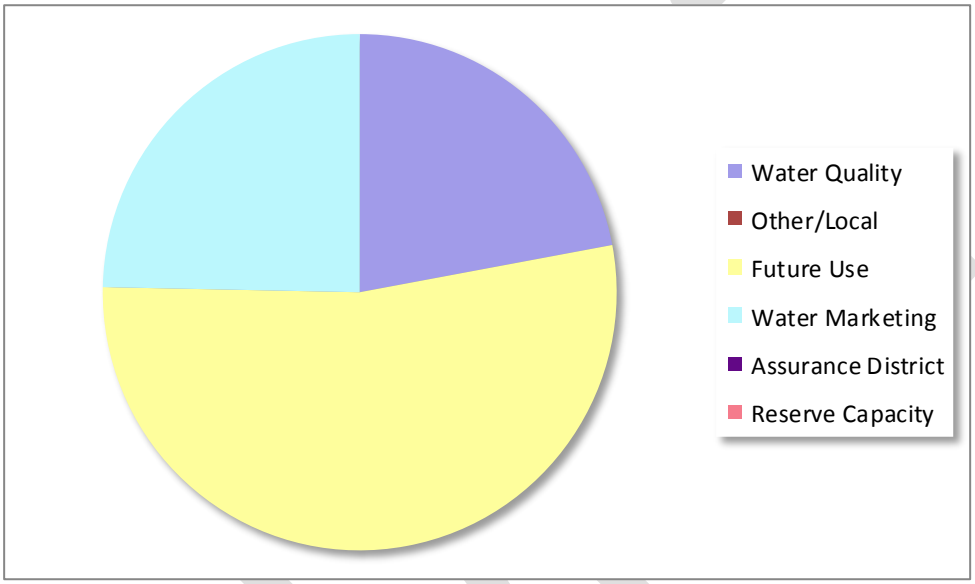


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
81-1	Miami County Rural Water District No. 2	10/21/2023	239,440,000	735	239,440,000	735
13-1	Hillsdale Area Water Cooperative	12/31/2052	4,415,476,000	13,551	5,308,560,000	16,291
			4,654,916,000	14,285	5,548,000,000	17,026

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

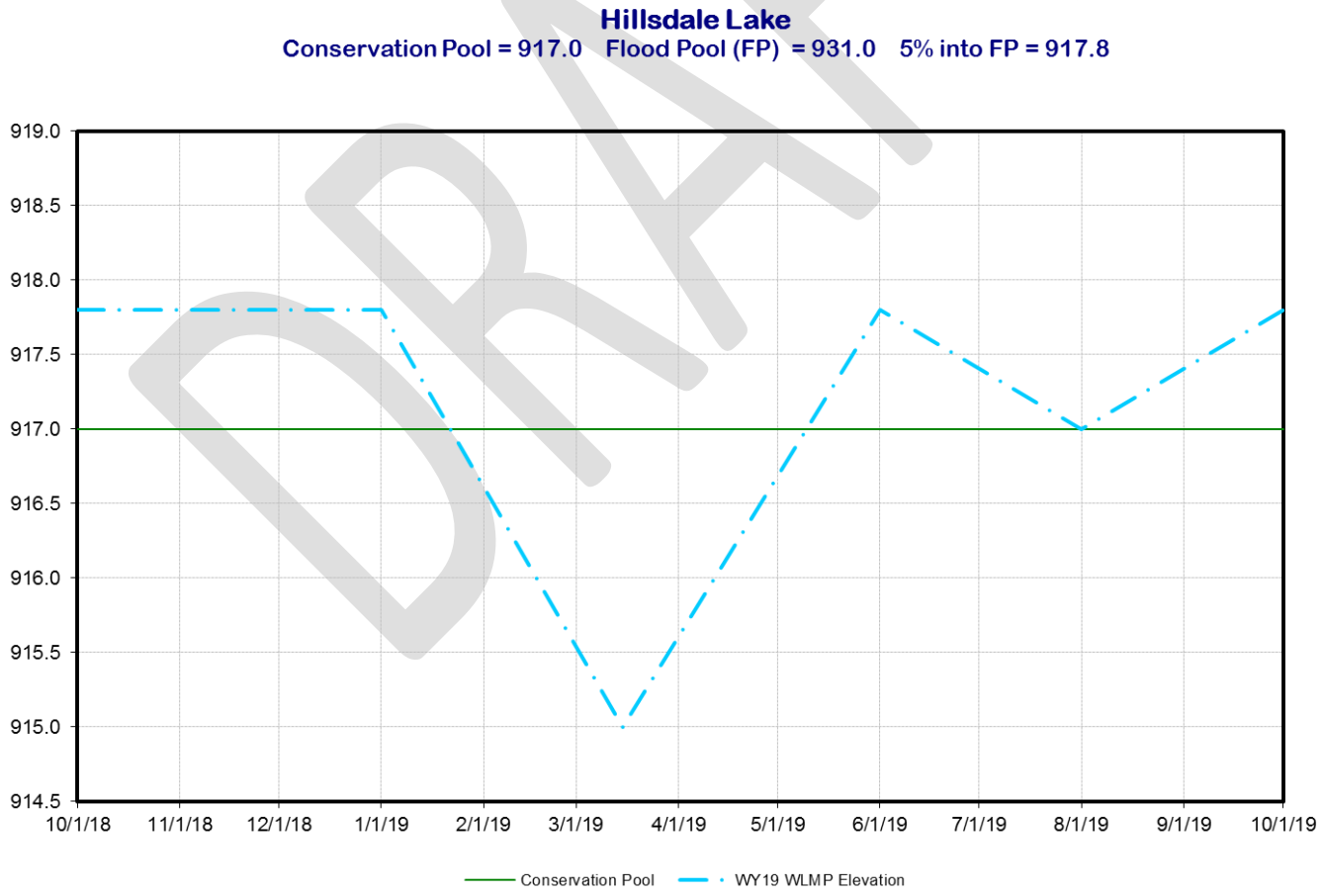
Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
15.5	17,381	Current Yield
12.7	14,285	Marketing Contracts
0.0	0	WAD Storage Yield
10.6	11,877	Future Use Yield
0.0	0	Surplus Yield
0.00	**0**	**Surplus Yield Available**

Lake Level Management Consideration

According to the Lake Level Management Plan, pool level may be lowered in January (or prior to freezing). The minimum lake level in this plan does not require disposition of surplus water.



John Redmond Reservoir

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	1020 - 1041	Flood Pool Elevation (ft msl)	1041 - 1068

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	23.82%	0	14,689
Other/Local	0.00%	0	0
Water Supply	76.18%	32.0	46,977
Future Use	0.00%	0.0	0
In Service	76.18%	32.0	46,977
Water Marketing	69.06%	29.0	42,587
Assurance District	7.12%	3.0	4,391
Reserve Capacity	0.00%	0.0	0

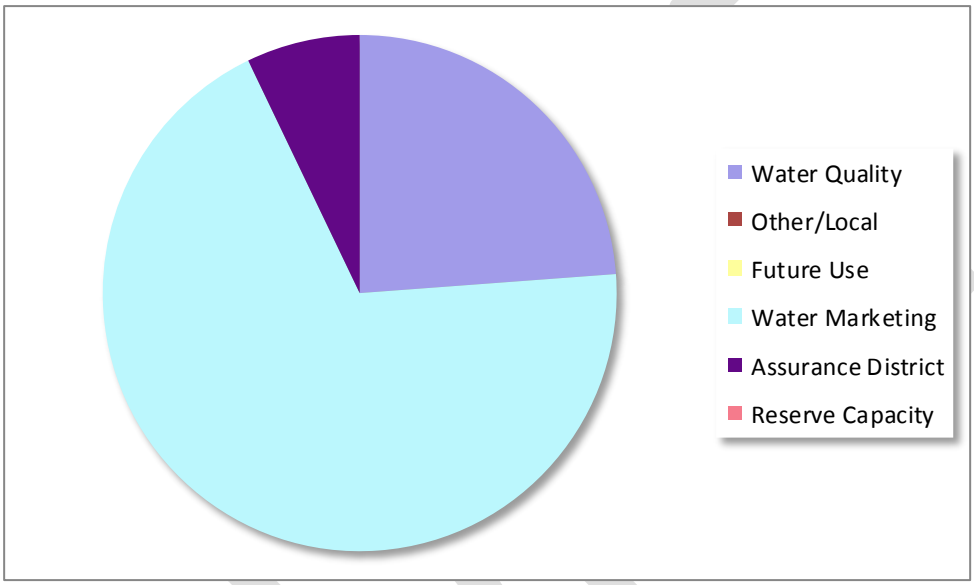


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
17-2	Wolf Creek Nuclear Generating Station	12/31/2022	9,368,000,000	28,749	9,368,000,000	28,749
	(KG&E, KCP&L, KEPC)		9,368,000,000	28,749	9,368,000,000	28,749

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
32.0	35,851	Current Yield
25.6	28,749	Marketing Contracts
3.0	3,351	WAD Storage Yield
0.0	0	Future Use Yield
3.3	3,751	Surplus Yield
3.20	**3,585**	**Surplus Yield Available**

Lake Level Management Consideration

No Lake Level Management Plan was prepared for John Redmond for Water Year 2019.

Kanopolis Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	1431 - 1463	Flood Pool Elevation (ft msl)	1463 - 1508

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	53.40%	0	23,431
Other/Local	0.00%	0	0
Water Supply	46.60%	8.1	20,448
Future Use	0.00%	0.0	0
In Service	46.60%	8.1	20,448
Water Marketing	23.46%	4.1	10,294
Access District	23.14%	4.0	10,154
Reserve Capacity	0.00%	0.0	0

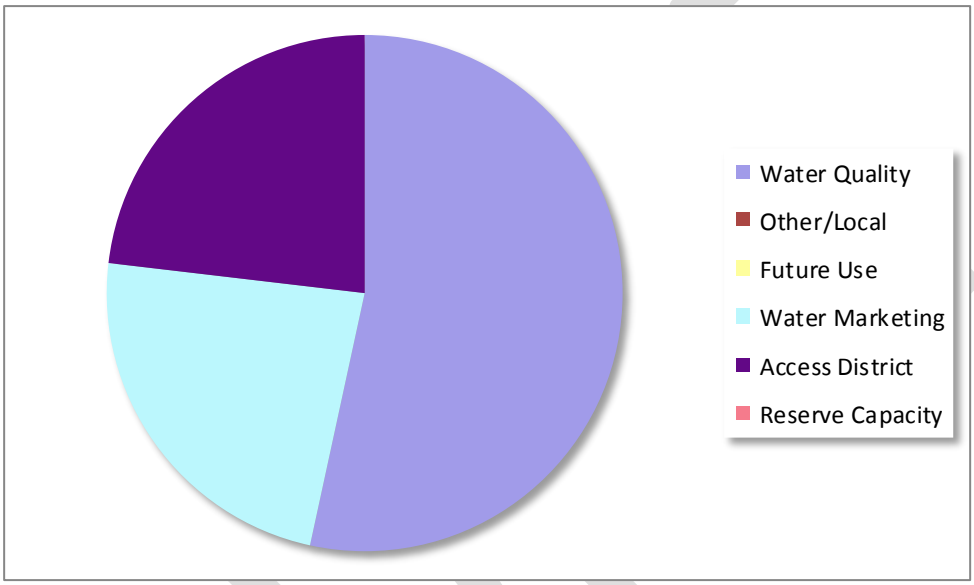


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
01-2	Post Rock Rural Water District	7/12/2041	390,000,000	1,197	400,000,000	1,228
			390,000,000	1,197	400,000,000	1,228

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
City of McPherson Board of Public Utilities	4/6/2019	3,650,000,000	11,201
Post Rock Rural Water District	6/22/2019	730,000,000	2,240
City of Russell	6/23/2019	465,000,000	1,427
White Energy Partners	7/14/2019	550,000,000	1,688

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

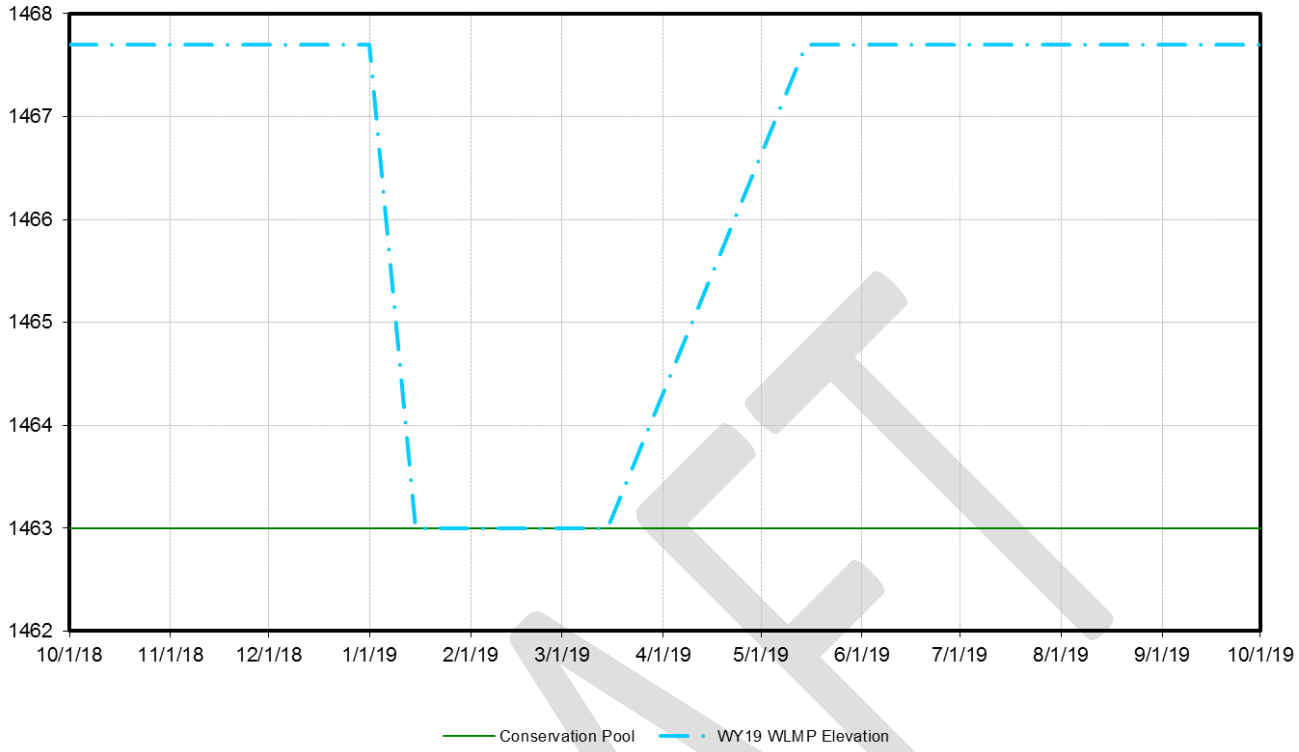
mgd	AF/yr	
8.1	9,051	Current Yield
1.1	1,197	Marketing Contracts
4.0	4,495	AD Storage Yield
0.0	0	Future Use Yield
3.0	3,360	Surplus Yield
0.81	**905**	**Surplus Yield Available**

Lake Level Management Consideration

In accordance with the Lake Level Management Plan for Kanopolis, no conservation storage will be evacuated during the 2019 Water Year.

Kanopolis Lake

Conservation Pool = 1463.0 Flood Pool (FP) = 1508.0 5% into FP = 1468.7



Marion Reservoir

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	1320 - 1350.5	Flood Pool Elevation (ft msl)	1350.5 - 1358.5

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	35.88%	0	28,537
Other/Local	0.00%	0	0
Water Supply	64.12%	5.1	50,997
Future Use	0.00%	0.0	0
In Service	64.12%	5.1	50,997
Water Marketing	45.77%	3.66	36,403
Assurance District	0.43%	0.03	342
Reserve Capacity	17.92%	1.43	14,252

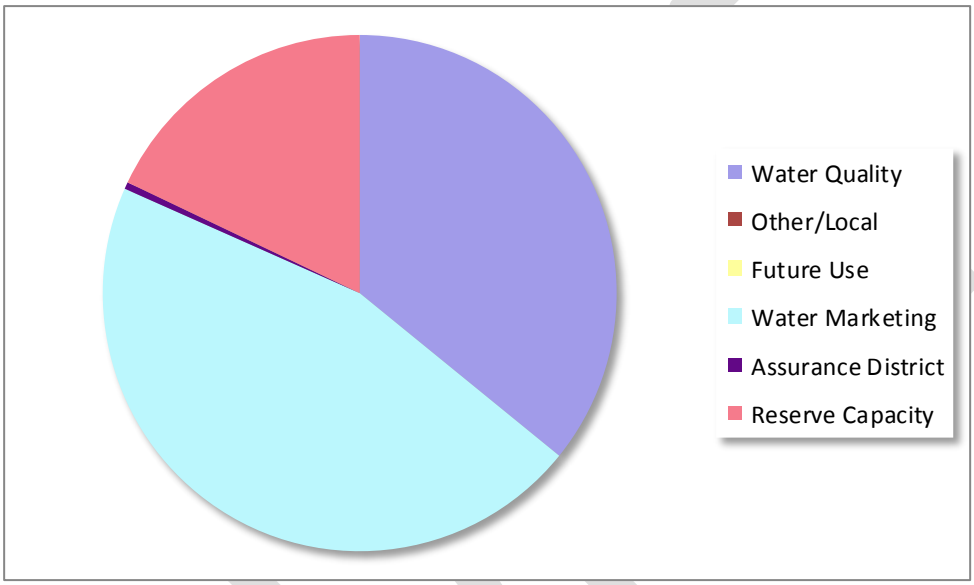


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
80-1	City of Hillsboro	12/22/2021	300,000,000	921	300,000,000	921
81-4	City of Marion	10/3/2023	237,500,000	729	237,500,000	729
99-1	City of Peabody	4/9/2039	60,000,000	184	60,000,000	184
			597,500,000	1,834	597,500,000	1,834

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

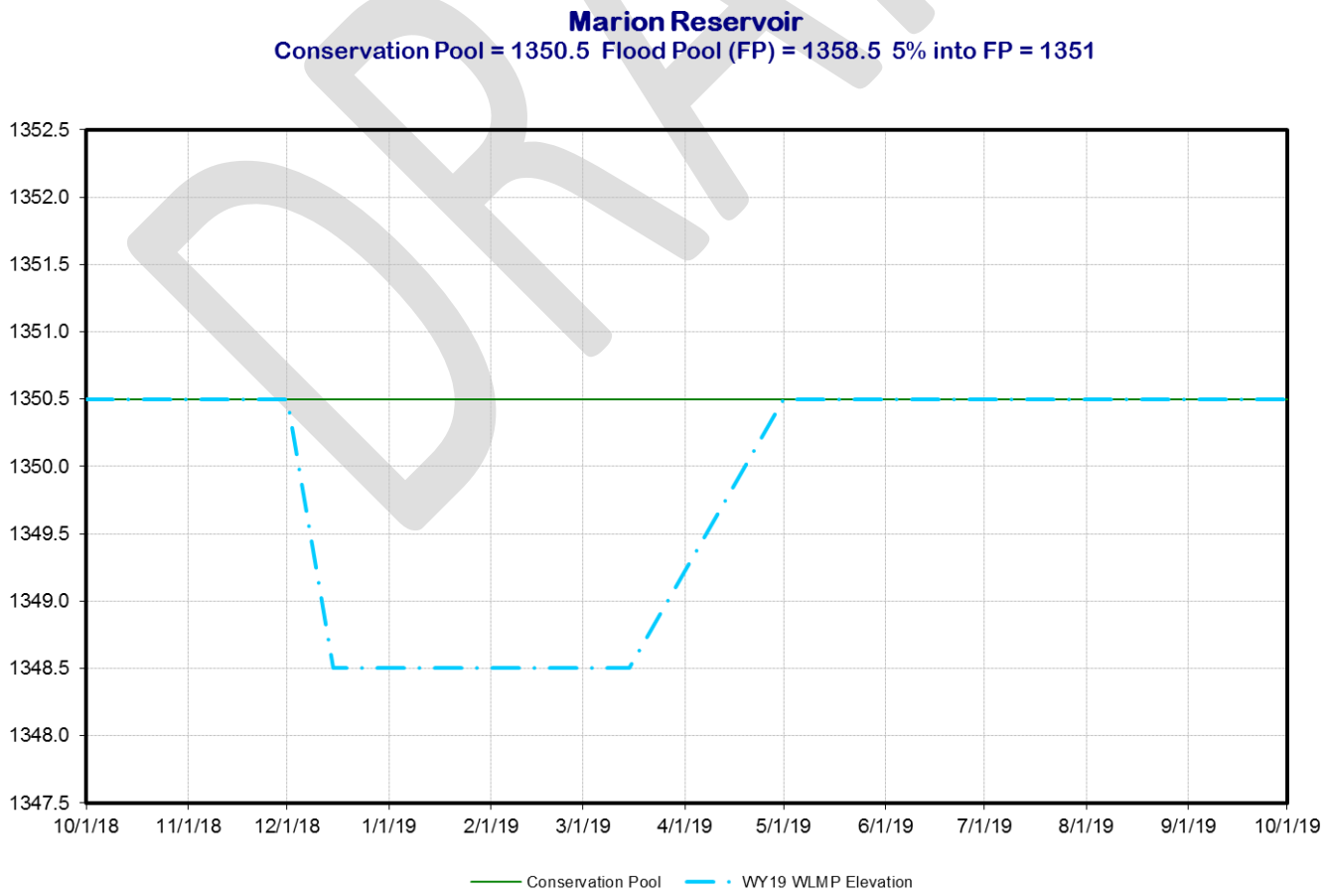
Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
17-1	Jost Farms	12/31/2017	5,000,000	15

Table 5: Surplus Yield

mgd	AF/yr	
5.1	5,755	Current Yield
1.64	1,834	Marketing Contracts
0.03	39	WAD Storage Yield
0.0	0	Future Use Yield
3.46	3,882	Surplus Yield
0.51	**575**	**Surplus Yield Available**

Lake Level Management Consideration

According to the Lake Level Management Plan, pool level may be lowered in December (or prior to freezing). The minimum lake level in this plan does not require disposition of surplus water.



Melvern Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	975 - 1036	Flood Pool Elevation (ft msl)	1036 - 1057

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	27.59%	0	40,949
Other/Local	37.93%	0	56,296
Water Supply	34.48%	8.7	51,175
Future Use	0.00%	0.0	0
In Service	34.48%	8.7	51,175
Water Marketing	9.90%	2.5	14,694
Assurance District	7.17%	1.8	10,642
Reserve Capacity	17.41%	4.4	25,840

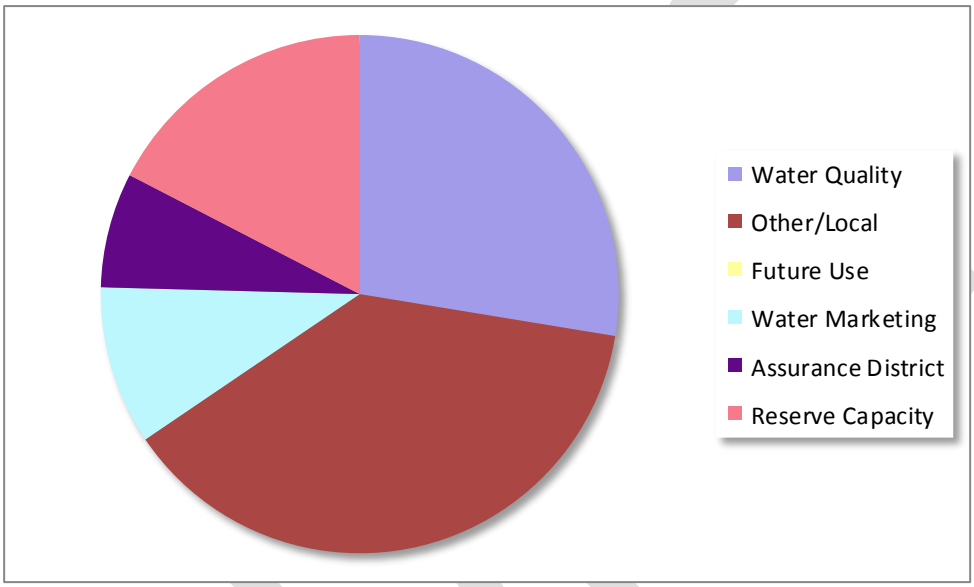


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
93-3	City of Osage City	4/22/2033	100,000,000	307	100,000,000	307
93-2	City of Burlingame	7/15/2033	65,000,000	199	65,000,000	199
93-1	Public Wholesale Water Supply District No. 12	1/1/2035	450,000,000	1,381	547,430,000	1,680
05-6	City of Harveyville	8/11/2045	25,000,000	77	25,000,000	77
			640,000,000	1,964	737,430,000	2,263

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

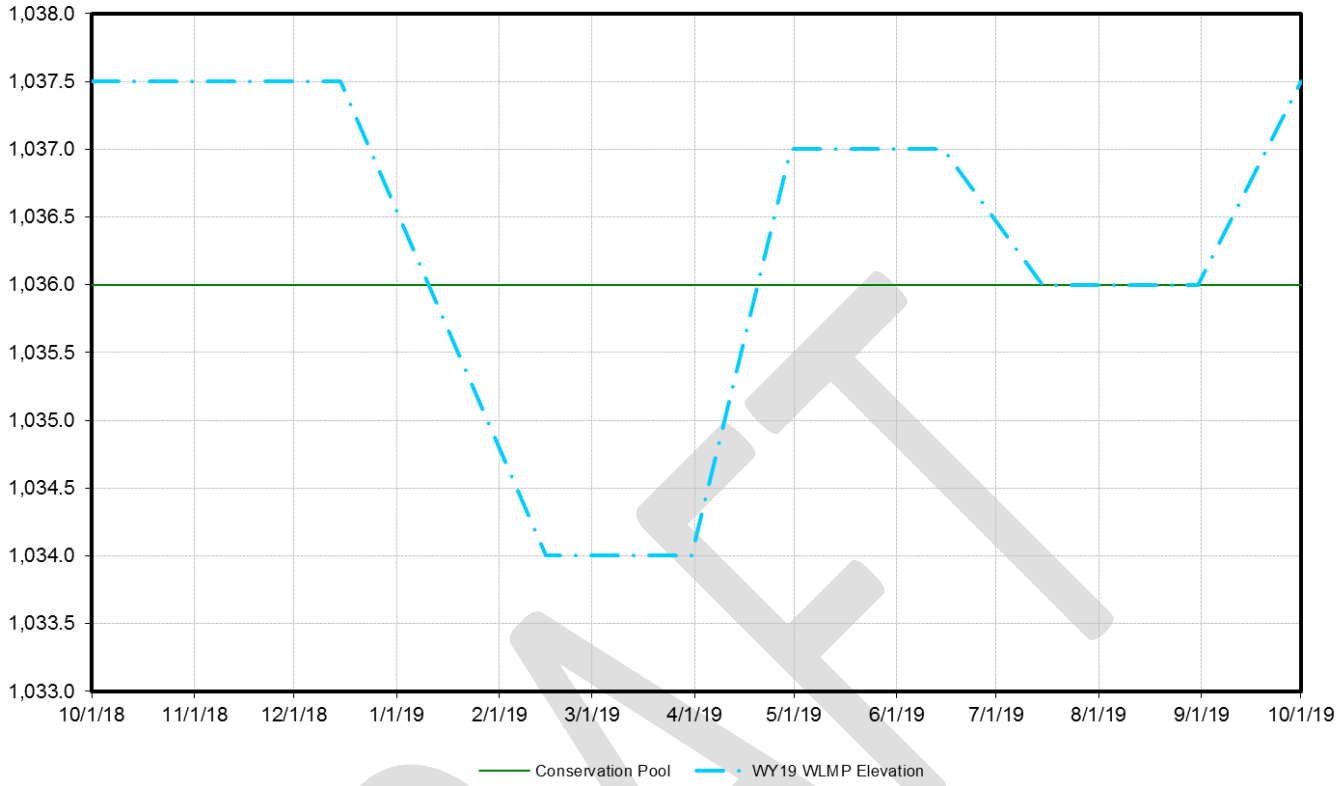
mgd	AF/yr	
8.7	9,739	Current Yield
1.8	1,964	Marketing Contracts
1.8	2,025	WAD Storage Yield
0.0	0	Future Use Yield
5.1	5,750	Surplus Yield
0.87	**974**	**Surplus Yield Available**

Lake Level Management Consideration

According to the Lake Level Management Plan, pool level may be lowered in December (or prior to freezing). The minimum lake level in this plan does not require disposition of surplus water.

Melvern Lake

Conservation Pool = 1036.0 Flood Pool (FP) = 1057.0 5% into FP = 1037.5



Milford Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	1080 - 1144.4	Flood Pool Elevation (ft msl)	1144.4 - 1176.2

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	0.00%	0	0
Other/Local	0.00%	0	0
Water Supply	100.00%	108	364,039
Future Use	66.12%	71	240,703
In Service	33.88%	37	123,336
Water Marketing	15.55%	17	56,608
Assurance District	18.33%	20	66,728
Reserve Capacity	0.00%	0	0

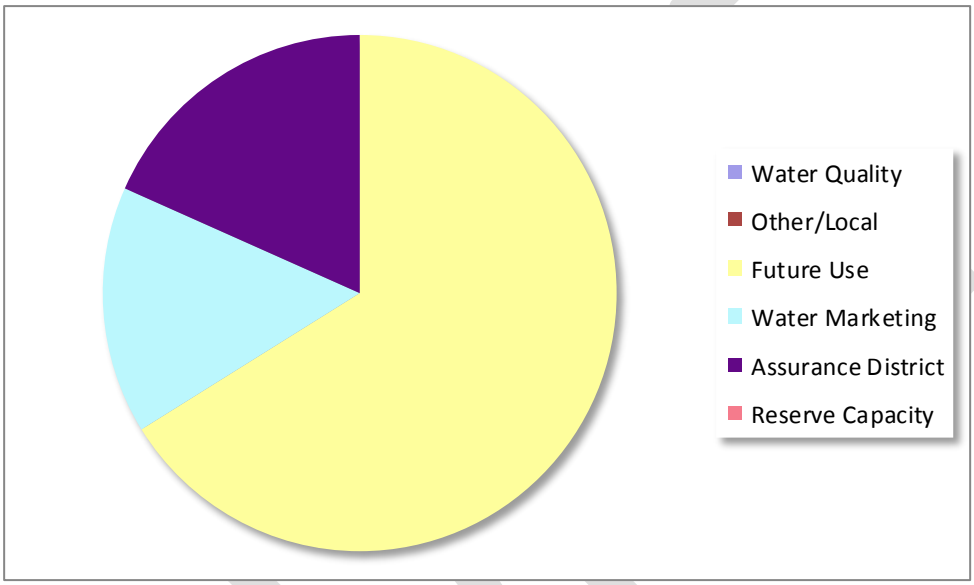


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
80-2	Westar Energy - Jeffrey Energy Center	12/5/2022	7,300,000,000	22,403	7,300,000,000	22,403
			7,300,000,000	22,403	7,300,000,000	22,403

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
108	121,173	Current Yield
20	22,403	Marketing Contracts
20	22,211	WAD Storage Yield
71	80,119	Future Use Yield
0.0	0	Surplus Yield
0.00	**0**	**Surplus Yield Available**

Lake Level Management Consideration

In accordance with the Lake Level Management Plan for Milford, pool level will be lowered in January. The quantity of water in the future use pool is sufficient for the evacuation of storage associated with the change in elevation.

Background on the 2019 Milford Lake Management Plan

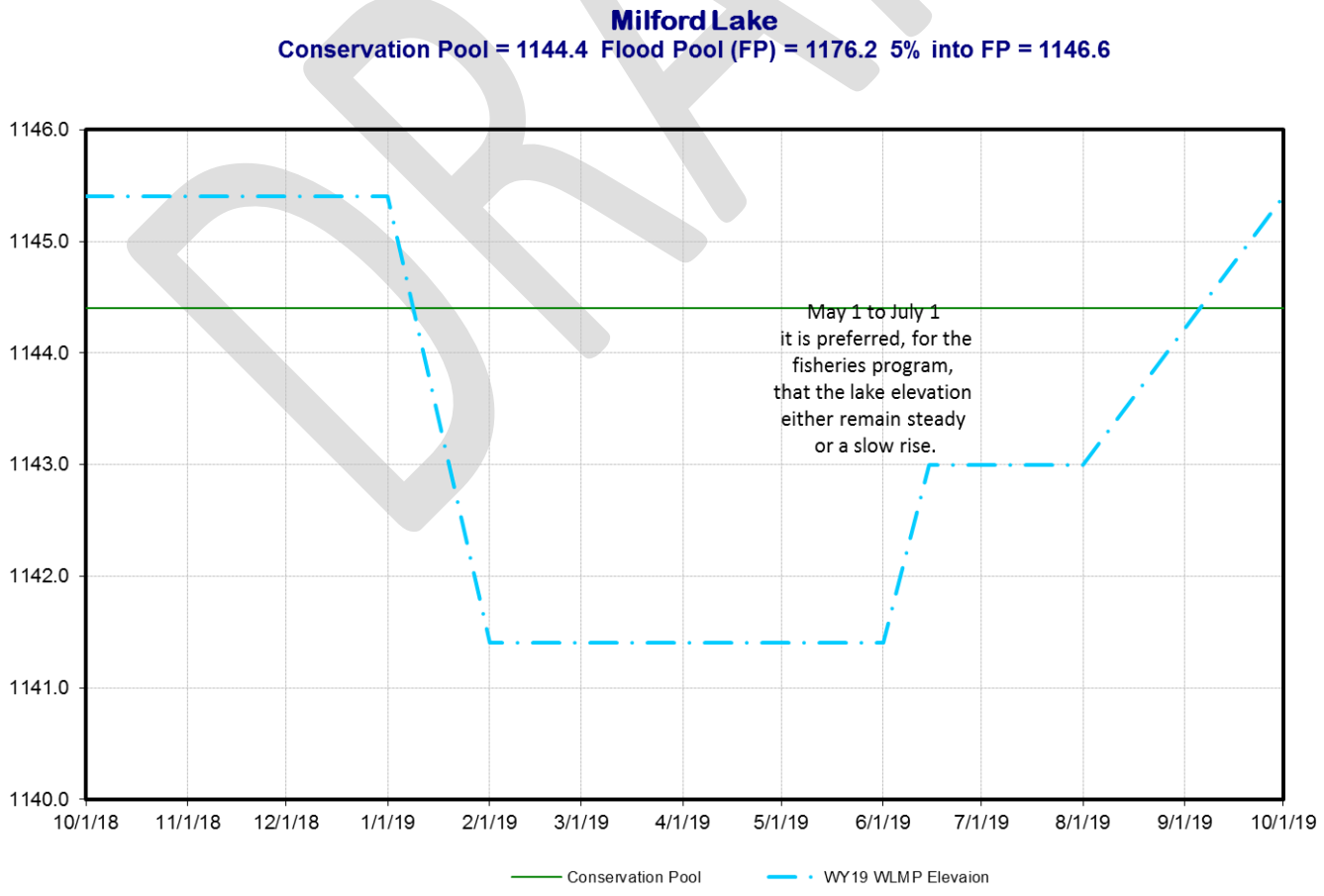
In proposing the 2019 Water Level Management Plan, the Kansas Department of Health and Environment noted the light-to-moderate blue-green algae (cyanobacteria) blooms in 2012, 2013, 2017 and, none thus far, in 2018. By coincidence or otherwise, these corresponded to periods when the conservation storage pool level was maintained or managed to remain below the 1144.4' elevation demarcating conservation pool from Milford's flood pool.

While the drawn down conditions of 2012 – 2013 were induced by drought and the Corps use of conservation storage to supplement navigation support flows on the Missouri River in Autumn 2012, pool level management in 2017 and 2018 maintained a three-foot drawdown in Spring of each year followed by maintenance of pool levels over the Summer within 1' – 1.4' of the top of conservation storage. Even as runoff caused the pool to rise above desired target elevations, the Corps managed releases to return to those planned elevations as quickly as possible and as conditions permitted. The rationale behind the 2017 – 2018 drawdowns was to create a cushion of storage to hold high flows and not allow them to inundate lakeside lands and introduce any deposited nutrients into the lake.

An unforeseen, but fortuitous result of managing the pool level plan in 2017 was high outflow releases (but staying below the 2000 cuffs threshold to protect the fishery spawn and fry). Those releases moved water that had accumulated in the lower portions of the flood pool out of the lake and, in doing so, caused longitudinal movement of water from the causeway area of Zone C down toward the dam outlet in Zone A. This resulted in stretching the developing algal bloom in Zone C into Zone B, thereby preventing the bloom from reaching a critical mass and density in Zone C. During 2014, 2015 & 2016, the algal bloom in Zone C accumulated into such a high density that it was resilient to dispersion from wind or late summer inflow events. Coincidentally, the large mass of cyanobacteria manifested into offensive odors that curtailed outdoor activities near Wakefield. Cell counts and microcystin toxin concentrations also elevated to warning and closure levels for the duration of the summer and well into the fall of those years. That phenomenon did not occur in 2017 and the movement of water through the lake zones is one factor that may have contributed to that outcome.

So far in 2018, no bloom has occurred on Milford as the pool remained below conservation level until mid-May and then was only within the first foot of the flood pool. The proposed 2019 pool level management plan intends to build on these empirical results of the past two years. The 2018 Legislature appropriated funds to KDHE to investigate in-lake treatment strategies to combat harmful algal blooms such as seen in the past in Milford. After investigating other efforts in states such as Florida and Ohio, KDHE has decided to pilot test planting of vegetation on shallow mud flats in Zone C of Milford Lake to compete against the algal population for the accumulated nutrients in those sediments. Additionally, application of some chemical treatment on those shallows to lock up available phosphorus or effectively kill off algal cells before they coalesce into a harmful bloom will be investigated.

To implement these strategies, the mudflats near the Wakefield causeway need to be exposed through drawing the lake down. Discussions were held with the Kansas Department of Wildlife, Parks and Tourism and the Kansas Water Office over an acceptable magnitude and duration of such a drawdown that would not impede access to the lake by the recreating public. The result of those discussions was agreement that continuation of the three-foot drawdown managed in 2017 & 2018 during the late winter and spring would be sufficient to facilitate the planting strategies. Additionally, the drawdown would be attempted to be maintained up to Memorial Day to maximize the chances of the planted vegetation taking hold in the exposed sediments before they were inundated. The pool over the summer would be held to within 1' – 1.4' of the top of the conservation pool as it had the previous two years. Rises would then be allowed in the latter part of the summer to prepare for the waterfowl migration season in the fall, inundating the upper wetlands to accommodate the migration. The impact of this proposed plan should be minimal for recreation access and will hopefully build on the success of the past two drawdowns to mitigate the impact of the harmful algal blooms in the lake.



Perry Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	850 - 891.5	Flood Pool Elevation (ft msl)	891.5 - 920.6

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	0.00%	0	0
Other/Local	0.00%	0	0
Water Supply	100.00%	68.0	190,013
Future Use	83.33%	56.6	158,338
In Service	16.67%	11.3	31,675
Water Marketing	0.00%	0.0	0
Assurance District	16.67%	11.3	31,675
Reserve Capacity	0.00%	0.0	0

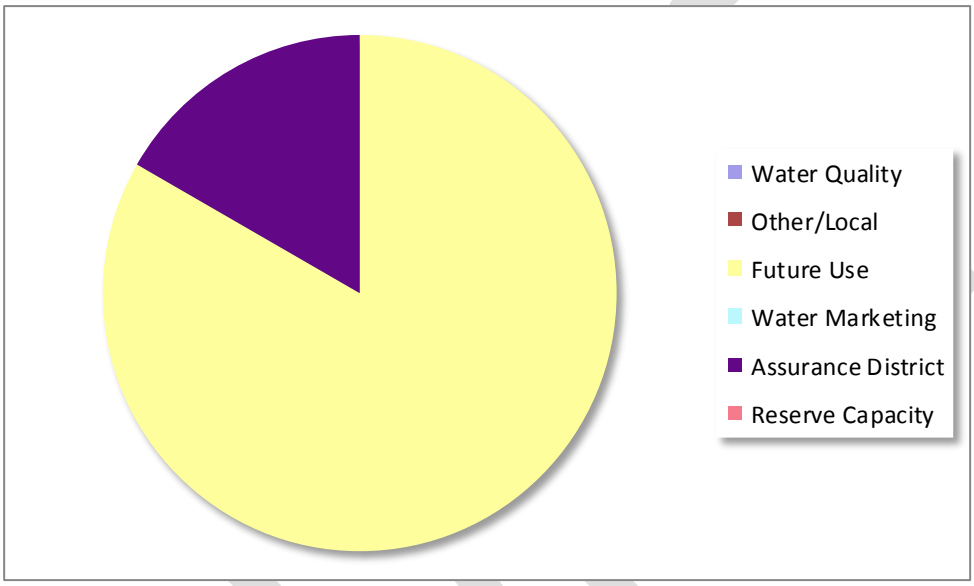


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There are no contracted quantities on file						
			0	0	0	0

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

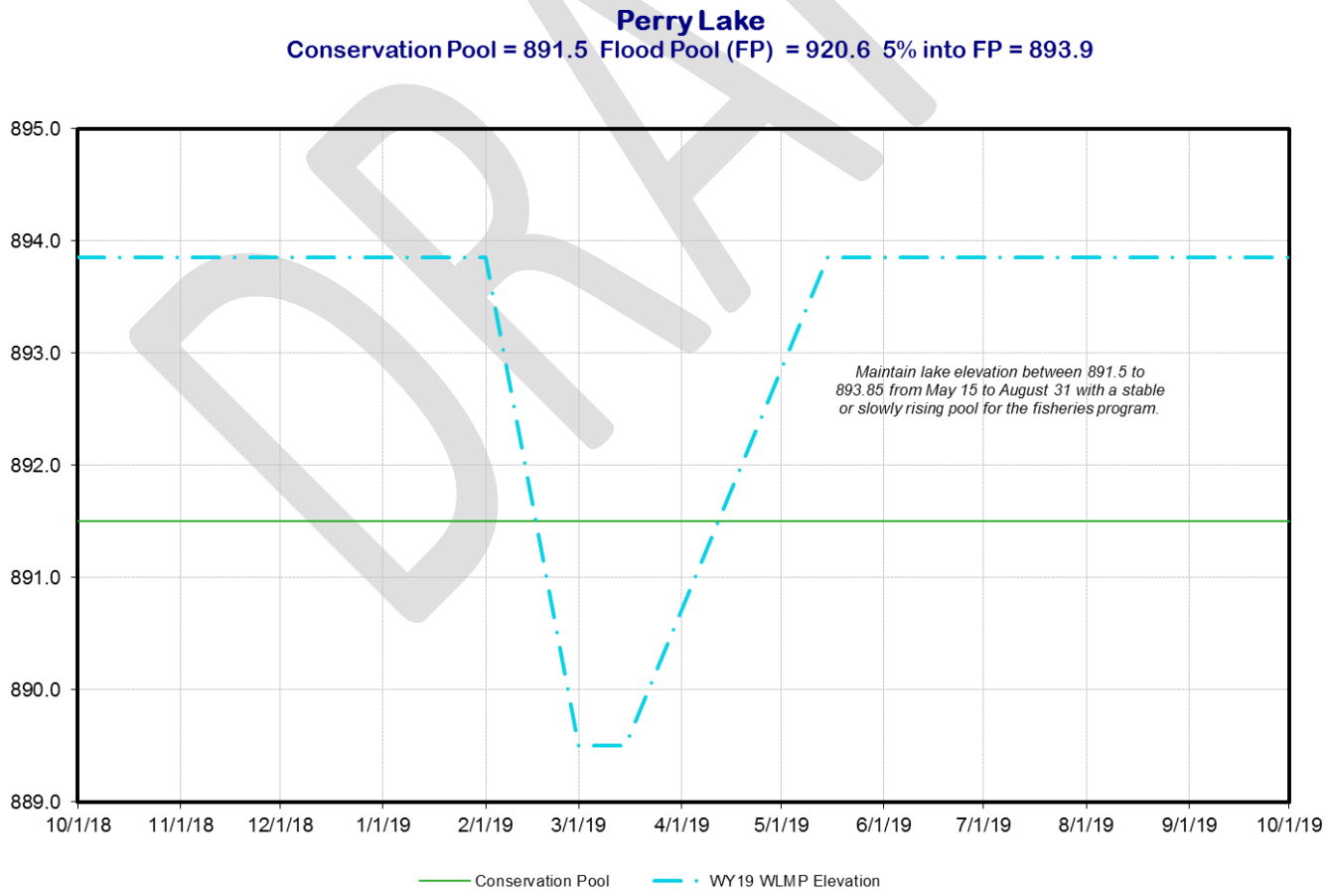
Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
68.0	76,168	Current Yield
0.0	0	Marketing Contracts
11.3	12,697	WAD Storage Yield
56.6	63,471	Future Use Yield
0.0	0	Surplus Yield
0.00	**0**	**Surplus Yield Available**

Lake Level Management Consideration

In accordance with the Lake Level Management Plan for Perry, pool level will be lowered in February. The quantity of water in the future use pool is sufficient for the evacuation of storage associated with the change in elevation.



Pomona Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	945 - 974	Flood Pool Elevation (ft msl)	974 - 1003

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	25.24%	0	13,220
Other/Local	0.89%	0	468
Water Supply	73.86%	7.9	38,680
Future Use	0.00%	0.0	0
In Service	73.86%	7.9	38,680
Water Marketing	1.52%	0.2	796
Assurance District	23.63%	2.5	12,375
Reserve Capacity	48.71%	5.2	25,509

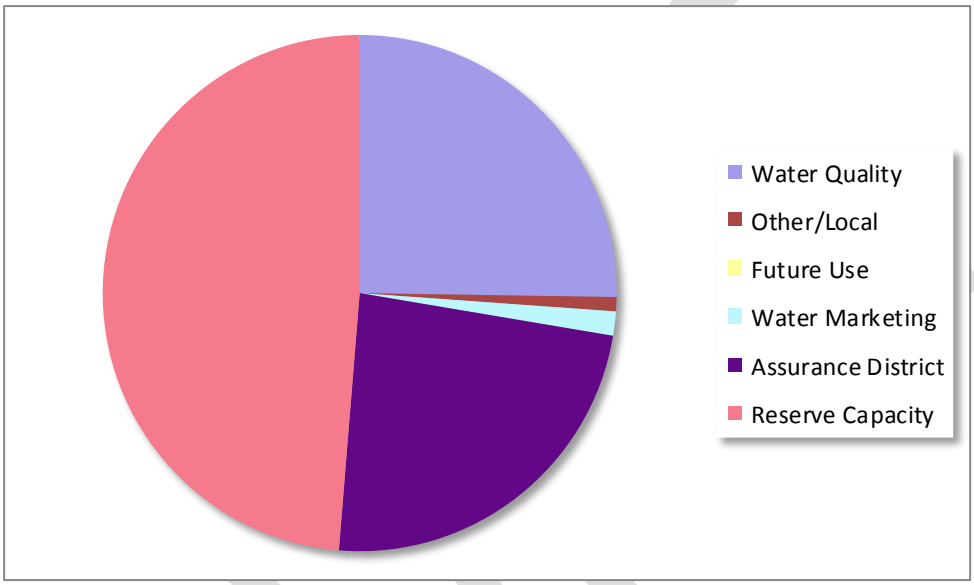


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
05-5	Osage County Rural Water District No. 3	7/10/2048	55,600,000	171	55,600,000	171
			55,600,000	171	55,600,000	171

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

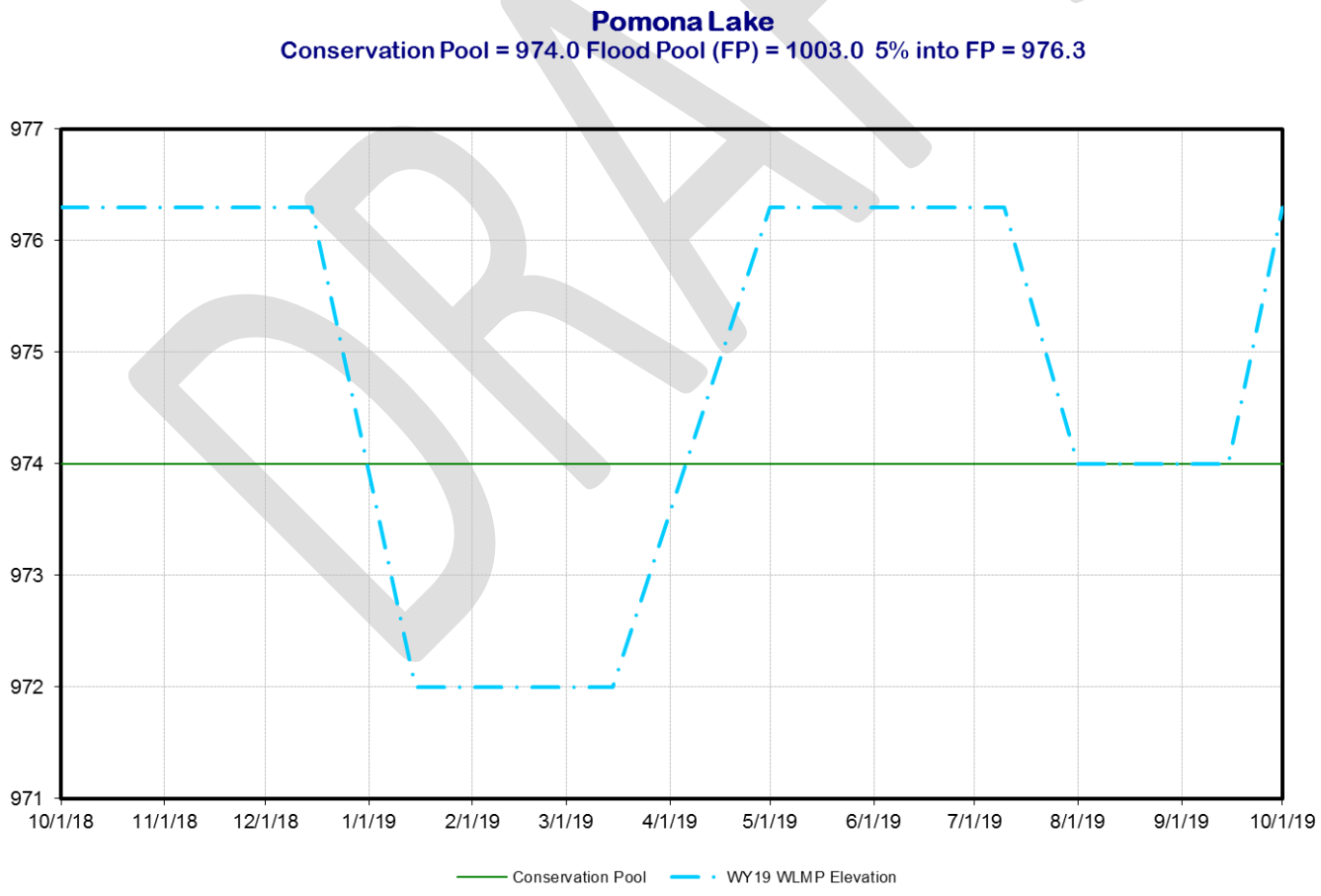
Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
7.9	8,847	Current Yield
0.2	171	Marketing Contracts
2.5	2,830	WAD Storage Yield
0.0	0	Future Use Yield
5.2	5,845	Surplus Yield
0.79	**885**	**Surplus Yield Available**

Lake Level Management Consideration

In accordance with the Lake Level Management Plan for Pomona, pool level will be lowered in December. The minimum lake level in this plan does not require disposition of surplus water.



Toronto Lake

Table 1: Conservation Storage Break Out

Conservation/Inactive Pool Elev. (ft msl)	856 - 901.5	Flood Pool Elevation (ft msl)	901.5 - 931

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality/Supply	59.89%	2.8	8,790
Inactive (Below 896.0)	37.78%	1.8	5,545
Water Supply	2.33%	0.1	341
Future Use	0.00%	0.0	0
In Service	2.33%	0.1	341
Water Marketing	2.33%	0.1	341
Assurance District	0.00%	0.0	0
Reserve Capacity	0.00%	0.0	0

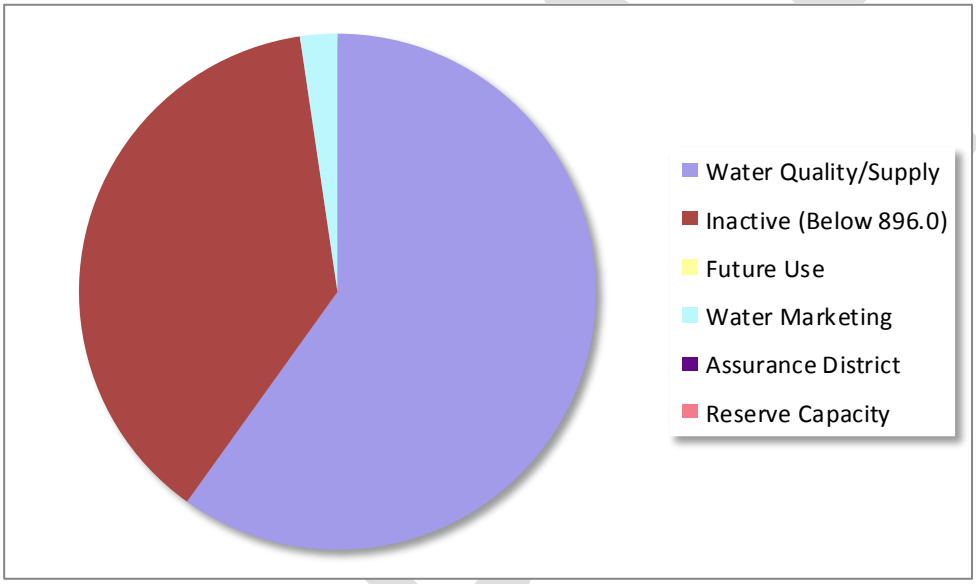


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There are no contracted quantities						

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
4.7	5,238	Current Yield
0.0	0	Marketing Contracts
0.0	0	WAD Storage Yield
0.0	0	Future Use Yield
0.1	122	Surplus Yield
0.11	**122**	**Surplus Yield Available**

Lake Level Management Consideration

No Lake Level Management Plan was prepared for Toronto for Water Year 2019.

Tuttle Creek Lake

Table 1: Conservation Storage Break Out

Conservation Pool Elevation (ft msl)	1020 - 1075	Flood Pool Elevation (ft msl)	1075 - 1136

	Break Out of Conservation Storage	Current Yield (mgd)	Current Storage (acre feet)
Water Quality	59.02%	0	131,693
Other/Local	0.00%	0	0
Water Supply	40.98%	174.6	91,440
Future Use	0.00%	0.0	0
In Service	40.98%	174.6	91,440
Water Marketing	0.00%	0.0	0
Assurance District	33.89%	144.4	75,620
Reserve Capacity	7.09%	30.2	15,820

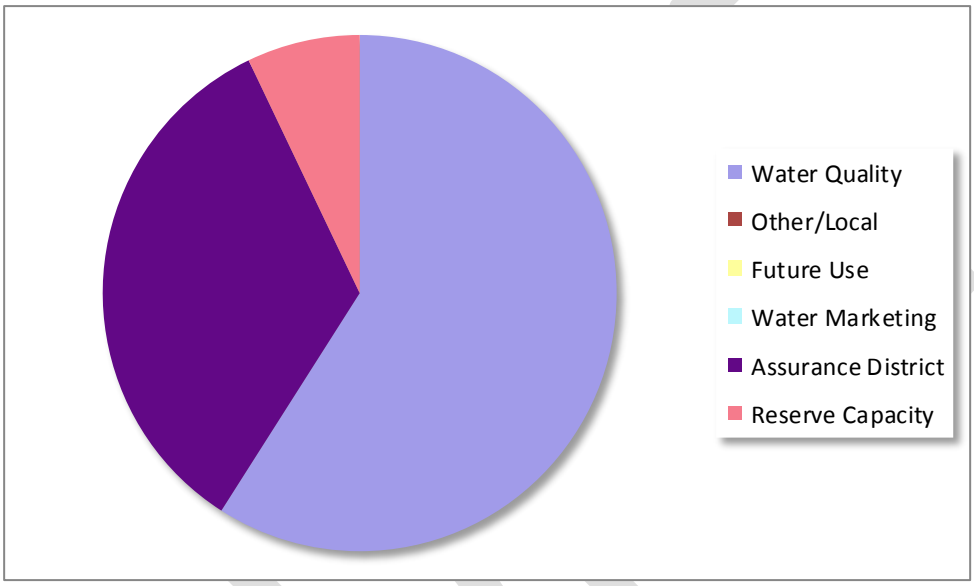


Table 2: Contracted Quantities

Contract Number	Customer Name	Contract End Date	2019 Maximum Gallons	2019 Maximum AF	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There are no contracted quantities on file						
			0	0	0	0

Table 3: Pending Applications

Applicant Name	Application Expiration Date	Requested Quantity Gallons	Requested Quantity AF
There are no pending applications on file			

Table 4: Past Surplus Contracts

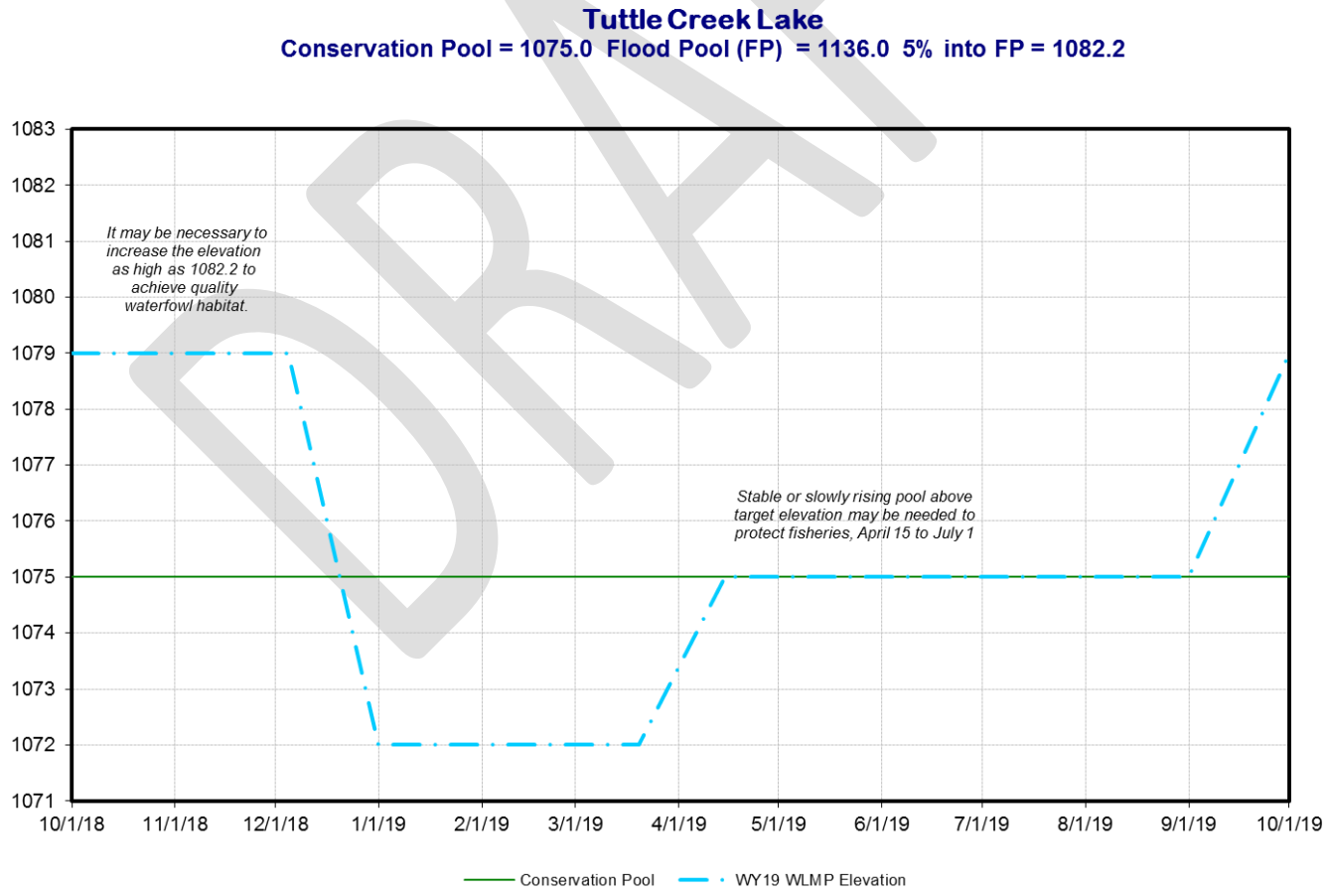
Contract Number	Customer Name	Contract End Date	Annual Contract Maximum Gallons	Annual Contract Maximum AF
There were no surplus contracts in the past two years				

Table 5: Surplus Yield

mgd	AF/yr	
175	195,692	Current Yield
0	0	Marketing Contracts
144	161,835	WAD Storage Yield
0	0	Future Use Yield
30	33,857	Surplus Yield
17.5	**19,569**	**Surplus Yield Available**

Lake Level Management Consideration

In accordance with the Lake Level Management Plan for Tuttle Creek, pool level will be lowered in December. The minimum lake level in this plan does not require disposition of surplus water.



MEMO

DATE: December 13, 2018
TO: Kansas Water Authority
FROM: Cara Hendricks, P.E.; Ginger Harper
RE: Federal Updates

Kansas Water Office
900 SW Jackson Street, Suite 404
Topeka, KS 66612
Phone: (785) 296-3185
Fax: (785) 296-0878
www.kwo.org

Kansas River Reservoirs Flood and Sediment Study

As part of its FY 2019 Work Plan, the U.S. Corps of Engineers (USACE) recently announced authorization of $1.5 million in federal funds for the "Kansas River Reservoirs Flood and Sediment Study". It is anticipated that the study will be completed over 5 years, with total funding of $3 million and a required 25% non-federal/sponsor cost share.

The overall purpose of the study is to cooperatively investigate water resource problems and opportunities in the Kansas River Basin, and to recommend comprehensive long term solutions. Significant need and opportunities exist in the areas of flood risk management and water supply availability and sustainment, as well as other related purposes. Previous discussions regarding the general scope of study have included the evaluation of the Kansas River Basin system operating plan, lake operations and manuals, lake facilities and features, conditions upstream and downstream of the lakes, infrastructure, and other related needs in the system. This includes a comprehensive existing and future conditions update of flood risk, drought risk, ecosystem degradation, and water supply availability and sustainment.

The Kansas Water Office recently met with USACE representatives to discuss the general approach for the study, including a summary of the overall process and major milestones. Next steps include the execution of a Feasibility Cost Sharing Agreement (FCSA) and the development of a Project Management Plan. The FCSA requires non-federal sponsor funding of $25,000 upon execution.

The Kansas Water Office recommends approval to enter into a Feasibility Cost Sharing Agreement (FCSA) with the U.S. Army Corps of Engineers for the Kansas River Reservoirs Flood and Sediment Study.

2018 Farm Bill

The 2018 Farm Bill is (as of the writing of this memo) headed to the President's desk for signature. The Conservation Title of the bill received significant attention, revision, and ultimately came together in a fashion that will help boost many of the things we are currently engaged in in Kansas. Overall, the title seeks more source water protection through targeting of agricultural practices: Prioritization for conservation resources for those types of practices. The bill directs USDA to focus EQIP, RCPP, etc. towards those types of practices that get at water quality issues.

A summary of provisions of specific interest is below:

Title II - Conservation
Conservation Stewardship Program: Fully monetized the program. Current law is an acre-based program managed with a national average payment rate of $18/acre. Eliminated that structure and have provided a baseline program budget. The program will see an increase from $700 mill to $1 billion in funding over life of the bill. The baseline funding moving forward is $1 billion.

Grassland Conservation Initiative – New program within CSP
Now a one-time contract for set of producers in eligible land to enroll in 5 year contract, at $18/acre, and will address one resource concern by end of contract – soil, wildlife, etc. (broad definition, by design). This initiative is not subject to CSP payment limit.

Conservation Reserve Program (CRP): Changes will stair-step total acre enrollment caps for program 24 million to 27 million acres by 2023. Of note, the bill formally codified CREP – this will allow for new drought and water conservation agreements, such as dryland farming, to be included in conservation practices. The program will prioritize marginal and environmentally sensitive land in the program, and will encourage enrollment based on state work.

Environmental Quality Incentives Program (EQIP): Changes will stair-step funding up over life of the bill, from $1.75 billion to $2 billion by 2023. There is also an increase to program baseline. The program will now allow for certain entities to be eligible for payments related to irrigation efficiencies, including Irrigation districts, states, and GMDs.

Easements: program received increase in funding - $1.7 billion over 10 years.

Regional Conservation Partnership Program (RCPP): increase in funding to $300 million/year.

PL-566: Mandatory funding provided for program for first time. It is now set at $50 million/year and that amount is established as a baseline, and total program funding is $500 million over 10 years.

MEMO

DATE: December 11, 2018
TO: Kansas Water Authority
FROM: Greg Graff
RE: KWA RAC Operations Committee

Kansas Water Office
900 SW Jackson Street, Suite 404
Topeka, KS 66612
Phone: (785) 296-3185
Fax: (785) 296-0878
www.kwo.org

The KWA RAC Operations Committee met on December 10, 2018, via conference call. Discussion from the meeting included the following topics:

- RAC Board Training
- Vision Implementation Memorandum of Understanding (MOU)
- RAC Membership
  - New Membership Applications
  - Members with 3 or more consecutive absences
- RAC Messages to the KWA from the Cimarron, Equus-Walnut, and Upper Arkansas RACs

RAC Board Training

Following the August 2018 KWA meeting, discussions took place regarding potential tools and resources available to RACs to help improve committee operations. From these discussions we've become aware of a Community Board Leadership Series K-State Research and Extension (KSRE) put on to give community-based boards training to help be most effective and efficient with board responsibilities. This generally has been a 4 part series with the following sessions:

- Roles and Responsibilities of Board Members/Effective Meetings
- Understanding Fellow Board Members/Conflict Resolution
- Legal and Ethical Issues
- Strategic Planning

KWO plans to offer this training to any RAC members who are interested in participating. Also, in conjunction with RAC membership appointments which will take place later in 2019 for RAC membership positions with June 30, 2019 term expirations, KWO plans to develop a RAC training program specifically designed for RAC operations.

Vision Implementation MOU

At the August 2018 KWA meeting, Great Bend Prairie RAC Chair Berry Bortz reported on the RAC's desire to have a Vision and RAC Regional Goal Action Plan implementation standard operating procedure (SOP) developed to assist with inter-agency coordination efforts association. During the meeting it was noted by KWO Director Tracy Streeter that an appropriate response to this request would be development of a Vision Implementation MOU which could be discussed and agreed to by KWA Ex Officio agencies.

With the administration changes to take place in early 2019 it was discussed that a more appropriate time to bring the concept of improved interagency coordination and collaboration on Vision and RAC Regional Goal Action Plan implementation and a potential MOU forward would be after the administration transition is completed in 2019.

RAC Membership

Relating to RAC Membership, the RAC Operations Committee discussed current vacancies on several of the RACs as well as how to address situation with RAC members who have missed 3 or more consecutive meetings. As stated within the Memorandum of Internal Policy for Regional Advisory Committees (IPM-04), *"If a Regional Advisory Committee member does not attend three (3) consecutive meetings, the Kansas Water Office will notify the member that they will be replaced unless they notify the KWO with due cause. The KWO will then notify the KWA Committee on RAC Operations of the attendance issue along with a recommendation to either allow the member to continue, or to be replaced. If the KWA Committee on RAC Operations finds that the member should be replaced, the member will be notified and the KWO and KWA Committee will then follow the procedure as outlined when a vacancy occurs."*

There are several RAC members which meet this consecutive absence criteria, so KWO will attempt to contact these individuals and determine their interest in remaining on their respective RACs.

Applications have been received to fill current vacancies on the Great Bend Prairie and Upper Smoky Hill RACs. The following membership recommendations for the full KWA were discussed and approved by the Operations Committee:

- Great Bend Prairie RAC:
  - Appoint applicant Kendal Francis of Great Bend to the currently vacant Public Water Supply (cc) position with a term expiration of June 30, 2019.
- Upper Smoky Hill RAC:
  - Reassign current RAC member Kyle Spencer (At Large Public - cc) to represent the currently vacant Groundwater Management Position. Maintain Kyle's current term expiration of June 30, 2021.
  - Appoint applicant Richard Randall of Scott City to the At Large Public (cc) position previously held by Kyle Spencer. Term expiration date of June 30, 2021 for Richard's position.
  - Appoint applicant Shelly Turner of Healy to the currently vacant At Large Public 2 position with a term expiration of June 30, 2021. Re-categorize Shelly's position from At Large Public to Financial.
    - *Note – with membership recommendations the RAC would have 4 positions with 2019 term expirations and 5 with 2021 term expirations. Current membership structure for RAC has 5 positions with 2019 term expirations and 4 with 2021 term expirations.*

RAC Messages to the KWA

The RAC Operations Committee also discussed RAC messages to the KWA developed at recent RAC meetings from the Cimarron, Equus-Walnut and Upper Arkansas RACs. These RAC messages to the KWA, along with pertinent background information, KWO staff input, and proposed resolutions are included in this memo.

CIMARRON REGIONAL ADVISORY COMMITTEE:

Message: See Attached Letter

Background: See Attached Letter

Staff Input: There are two separate reports on potential groundwater and river flow effects of this project. One study was completed by the LGS Holding Group and a separate report was completed by GMD3. Upon closer review of the report completed by GMD3, Kansas Department of Agriculture (KDA) came to the conclusion that the area in question of this developing project sustains very little groundwater and that any water pumped for irrigation in Colorado shall have no reasonable impact to Kansas.

Proposed Resolution: The KWA recommends that additional background information on this topic be shared and discussed with the Cimarron RAC at a future RAC meeting.

EQUUS-WALNUT REGIONAL ADVISORY COMMITTEE:

Message 1: The Equus-Walnut Regional Advisory Committee (RAC) endorses the state fiscal year (SFY) 2020 and 2021 budget recommendations approved by the Kansas Water Authority (KWA) at the August 22, 2018 meeting in Manhattan. It is the hope of the RAC that if funding is approved by the Governor and Legislature as noted within the KWA budget recommendations that implementation of a remediation project to address the Burrton Chloride Plume will be able to move forward.

Background: Remediation of sources of groundwater contamination within the Equus Beds Aquifer is a priority of the Equus-Walnut RAC as noted within the Regional Goal Action Plan developed by the RAC for Equus-Walnut Priority Goal #5. One of the prominent sources of groundwater contamination within the Equus Beds Aquifer is the Burrton Chloride Plume. $50,000 in FY 2019 funding was appropriated by the Legislature to initiate the process of remediation project development for the Burrton Chloride Plume. Members of the Equus-Walnut RAC in July during the KWA budget development process suggested that $1,000,000 in FY 2020 and 2021 be included within the KWA budget recommendations. At the August 2018 KWA meeting the Full Authority approved a budget recommendation package which included $100,000 for both FY 2020 & 2021.

Staff Input: With FY 2019 funding and future funding needs in mind, KWO has been collaborating with Equus Beds Groundwater Management District #2 (GMD2) as well as the City of Wichita on the development of a process to allow necessary actions to take place in support of remediation project development. This process will include prioritization of potential chloride remediation sites, evaluation of remediation alternatives including groundwater treatment technologies, development of beneficial use strategies for treated groundwater and management alternatives for generated waste streams. A request for proposals for elements of this overall process will be conducted by GMD2 in 2019. Once completed, more information will be known on the foundational materials required for timely advancement of full-scale chloride remediation focused on the preservation of natural resources and generation of a positive economic impact to the region as well as which components of the overall process can be funded with financial resources available at this time. The Equus-Walnut RAC appreciates and continues to be supportive of ongoing efforts of the KWA and KWO to secure funding to address the Burrton Chloride Plume within the Equus Beds Aquifer.

Propoposed Resolution: The KWA appreciates the feedback received from the Equus-Walnut RAC on this issue and will continue to look for input and advice from the RAC on water resource issues impacting south-central Kansas including the Burrton Chloride Plume.

Message 2: The Equus-Walnut RAC was briefed by Roger Black, President of the Grouse-Silver Creeks Watershed Joint District No. 92 and Equus-Walnut RAC member (Watershed Protection membership category) on the potential unfunded liability many watershed districts across Kansas can encounter if emergency damages occur to watershed district structures as a result of flood events in which no federal emergency response/recovery dollars are made available to individual watershed districts and structure impacted. It is the hope of the RAC that the full KWA is made aware of this situation and that the feasibility of an insurance pool concept which would/could include any interested and up to all watershed districts in Kansas be explored.

Background: At the October 2018 Equus-Walnut RAC meeting, RAC Member Roger Black brought to the attention of the RAC with his personal experiences with the Grouse-Silver Creeks Watershed Joint District No. 92 in mind a potential situation which could be encountered by watershed districts within Kansas when dealing with emergency repairs to watershed district structures. It was also noted a situation with Big Caney Watershed District No 31 covering portions of Cowley, Elk and Chautauqua counties encountered when extreme flooding occurred but a federal disaster declaration did not take place, preventing FEMA funding from being available to help the watershed district with emergency repairs. It was also noted at this time it is unknown the cash reserves which watershed districts should have in place to cover operation and maintenance of structures as well as the potential viability of a pooled insurance program within Kansas for watershed districts.

Staff Input: Additional information from the State Association of Kansas Watersheds (SAKW) as well as the Kansas Department of Agriculture – Division of Conservation (KDA-DOC) regarding the potential extent of this type of financial situation among the watershed districts in Kansas as well as on the potential viability of a watershed district insurance pool in Kansas would be beneficial. Further exploration of these items as well as other associated items by SAKW and KDA-DOC with an update provided to the KWA and Equus-Walnut RAC at future meetings recommended.

Proposed Resolution: The KWA recommends further exploration of these items as well as other associated items by SAKW and KDA-DOC with an update provided to the KWA and Equus-Walnut RAC at future meetings recommended.

UPPER ARKANSAS REGIONAL ADVISORY COMMITTEE:

Message 1: See Attached Letter

Background: Additional Sources of Supply has been a continual topic of importance to the RAC since it was formed and is discussed at most meetings. Committee members are unsatisfied with progress on action items related to this theme. GMD 3 is also advocating for and pursuing additional sources of supply for southwest Kansas.

Staff Input: Additional Sources of Supply is an important part of the Vision that concerns not just this region, but is an issue that effects the entire state and is inherently related to interstate water issues. Given the significance and scope of the letter's subject matter it merits attention as a stand-alone item with the KWA. Recommendation would be to include this topic as a formal agenda item at a future KWA meeting.

Proposed Resolution: The KWA recommends inclusion of additional sources of supply for the Upper Arkansas Regional Planning Area as a formal agenda item at a future KWA meeting.

The KWA RAC Operations Committee recommends KWA approval of the proposed RAC membership actions for the Great Bend Prairie and Upper Smoky Hill RACs as well as proposed resolutions for RAC messages to the KWA from the Cimarron, Equus-Walnut, and Upper Arkansas RACs.

Cimarron Regional Advisory Committee

November 1, 2018

Kansas Water Authority
KWO Office
900 SW Jackson Street
Topeka, Kansas 66612

Re: Request for cost-share funds

Dear Kansas Water Authority Members:

In November of 2017 LGS Holding Group, a company out of Georgia filed to develop 30 existing wells in Colorado to pump for irrigation use. Located in Baca County along the Cimarron River approximately 8 miles from the Kansas Stateline, the wells are part of the LGS Ranch, formerly known as the Witcher Ranch before the company purchased it from Eric Witcher in 2017.

Groundwater Management District No. 3 (GMD3) is concerned that the well development will have effects on the Cimarron Grasslands and the Cimarron River downstream in Kansas. In April of 2018 the District submitted a statement of opposition but has since been denied standing in the case. Two reports have been put together to determine the potential effects of the pumping, including a study paid for by GMD3 and another put together by LGS Holding Group. There are discrepancies between these reports leaving uncertainty regarding potential impacts to Kansas.

To get a better understanding of the interaction between surface and groundwater along the Cimarron River GMD3 acquired a Forest Service permit and installed a groundwater observation well near the Colorado Stateline through help from the KGS team. In addition, the USGS will be re-installing the Elkhart river gage that was discontinued in 2007 at no charge in the Grasslands near the Stateline. Data collected from both pieces of equipment will provide a clearer picture of the river system hydrology and an improved prediction of effects to Southwestern Kansas over time. The groundwater observation well cost approximately $9,000 to install and there will be an annual expense on KGS to maintain.

The project area is located within the Cimarron Planning Region, and the committee has remained up to date on the development and actions taken by the District. The committee is concerned about effects the pumping may have in the Cimarron Grasslands and believes that the installation of this Stateline equipment will provide valuable insight and data for the benefit of the Cimarron Planning Region. As such the Cimarron RAC requests that cost-share funding be provided for the installed groundwater observation well along the Cimarron River.

On behalf of the members of the Cimarron Regional Advisory Committee I thank you for your consideration.

Sincerely,

Nick Hatcher, Chairman
Cimarron Regional Advisory Committee

Upper Arkansas Regional Advisory Committee

November 29, 2018

Kansas Water Authority
KWO Office
900 SW Jackson Street
Topeka, Kansas 66612

Re: Augmentation of Water Resources in Upper Arkansas basin area.

Dear Kansas Water Authority Members:

I am writing to you today at the request of the members of the Upper Arkansas RAC. The plan outlined in the Long-Term Vision for the Future of Water Supply in Kansas is broken into four main themes, one of those being Additional Sources of Supply. The document focuses on strategies aimed toward finding and restoring additional sources of supply, including:

- The transfer of water supplies between basins
- An increase of other sources of available storage (in our case, along the Arkansas River)
- Research regarding the utilization of playa resources in the region

The committee is concerned about the future of irrigated agriculture as the basis of the region's economy and tax base while groundwater supplies continue to decline. For this reason securing additional sources of supply has been a continual topic of importance and is incorporated into the RAC's Goals and Action Plan.

The items outlined above, included in the regional goals and action plan, and contained in the vision document are of great significance to our committee. We strenuously encourage the Kansas Water Authority to prioritize these action items and work with stakeholders in the area to bring the action items to fruition.

Sincerely,

Fred Jones, Chairman
Upper Arkansas Regional Advisory Committee

MEMO

DATE: December 14, 2018
TO: Kansas Water Authority
FROM: Earl Lewis
RE: Interstate Water Management Fund

Kansas Water Office
900 SW Jackson Street, Suite 404
Topeka, KS 66612
Phone: (785) 296-3185
Fax: (785) 296-0878
www.kwo.org

In the attached letter, Groundwater Management District No. 3 has proposed development of an interstate water management fund. David Barfield will provide additional background at the meeting regarding how current interstate water issues are staffed and funded at the Kansas Water Authority meeting. We will be seeking your feedback and input on whether this idea should be pursued, and if so what form it should take.

No Kansas Water Authority action is necessary at this time.

Southwest Kansas
Groundwater Management District No. 3
2009 E. Spruce Street
Garden City, Kansas 67846
(620) 275-7147 phone (620) 275-1431 fax
www.gmd3.org

October 11, 2018
VIA e-mail

Tracy Streeter, Director, Kansas Water Office
Gary Harshberger, Chairman, Kansas Water Authority

RE: Interstate Water Management Fund,
Follow-up, January 22, 2018 Letter

Dear Director Streeter and Chairman Harshberger,

In a January 22, 2018 letter, we highlighted some Kansas Water Vision priority action items the GMD3 board is encouraging in support of Kansas renewable water supplies. If individual letters to highlight each item is preferred, we are happy to provide those. This letter is to highlight page 4 of our January letter concerning availability of sufficient funds for timely interstate water management. It was referenced as a litigation account. Though after some additional discussion, a more appropriate and collaborative purpose would be interstate water administrative support. Since the loss of funds in the Interstate Litigation Account (K.S.A. 82a-1802) years ago, the message has been that interstate questions would be funded as needed. However, "as needed" funding from regular agency budgets has proven inadequate and unworkable for generating the answers to significant or quick response questions.

To be clear, another interstate litigation account in the AG's office is not what we are recommending here. Rather, an Interstate Water Management Support account. Recently, KDA requested help from GMD3 for critical state evaluation of Colorado well pumping replacement plans affecting compact compliance and basin renewable supply to Kansas and to GMD3. Funds were not available from the KDA budget. Funding was provided by GMD3. However, the GMD3 source fund that is protected from state budgeting has also funded projects in GMD3 and is now almost depleted.

Another example this year was the lack of existing information to inform against thousands of acre feet of new Colorado groundwater development from the Cimarron River basin above GMD3 and the Stateline. The GMD3 High Plains Aquifer is closed, but not in Colorado or Oklahoma for new appropriations. We recognize the need to engage and inform the Colorado administrative and political process and hired consultants when Kansas officials did not have the resources to develop sufficient information; lacking resources to adequately develop and consider it.

Again this year, Colorado has requested a new account and benefits in John Martin Reservoir. The questions generated include what Kansas may need as an added benefit in order to favorably consider the request under the provisions of ARCA. We believe friendly interstate relations are promoted when Kansans can inform the discussions and the Kansas state team are enabled to be fully briefed on the options and outcomes in order to appropriately inform interstate discussions and protect Kansas interstate water interests.

There are recognized interstate water management questions all across Kansas. The lack of sufficient funds preserved for interstate water management support unnecessarily places Kansas staff and resources at significant disadvantage and in a subordinate role in interstate questions of future water supply significance. A dedicated funding source outside regular agency budget process is needed to preserve future source water for Kansas and enable informed interstate water discussions that may affect renewable supplies to Kansas for all time.

We ask that the Kansas Water Authority work to develop and secure the needed Interstate Water Management Support Account for Kansas water. Thank you for your consideration of this request and for the others in the January 2018 letter on Vision Action Priorities for Renewable Supplies. Please let us know if you have any questions.

Sincerely,

Kirk Heger, President
For the Board

MEMO

DATE: December 13, 2018
TO: Kansas Water Authority
FROM: Cara Hendricks, P.E.
RE: Water Injection Dredging Demonstration Project at Tuttle Creek Lake Update

900 SW Jackson Street, Suite 404
Topeka, KS 66612
Phone: (785) 296-3185
Fax: (785) 296-0878
www.kwo.org

The Kansas Water Office, in partnership with the Corps of Engineers, continues its efforts towards the implementation of a Water Injection Dredging (WID) demonstration project at Tuttle Creek Lake to promote sustainable long-term reservoir sediment management. WID is a process in which large volumes of water are injected at low pressure into the sediment bed near the bottom of the reservoir through the use of pumps and a series of nozzles located on a horizontal pipe positioned above the sediment bed. The injected water effectively fluidizes the sediment creating a 'density current' that allows the sediment to flow by gravity to deeper areas. In the case of Tuttle Creek Lake, the proposed WID demonstration project would be aimed at moving the sediment toward the existing low level outlet in the dam and monitoring the flow of the density current through the outlet during controlled discharges.

The proposed demonstration project will include construction of a WID prototype, demonstration of the WID prototype at Tuttle Creek Lake at different elevations and flow discharges, and comprehensive monitoring and evaluation of both the operational and environmental results.

Current Updates

In 2018, work completed by the state in support of the WID study included the collection of sediment cores and surface sediment samples at Tuttle Creek Lake and delivery to ERDC facility for testing, collection and analysis of velocity current transects at selected locations within the reservoir, and water quality sampling and analysis of sediment samples taken from Tuttle Creek Lake. On September 26, 2018, the Kansas Water Office also hosted a meeting with Corps and ERDC staff, representatives from multiple state agencies, interest groups and other downstream stakeholders to further discuss the ongoing WID research, and the development of an implementation plan for the onsite demonstration project at Tuttle Creek Lake, including planned monitoring efforts.

Current project efforts include the following:

- Compilation of available water quality data to identify any potential demonstration monitoring gaps.
- Additional velocity measurements and multibeam bathymetry are planned near the dam to gain further insight into the expected flow dynamics near the outlet for the demonstration.
- Sediment settling and elutriate testing, which simulates the impact of suspended sediment on water quality, are also being discussed.

These results will be compiled into a research and development plan that summarizes the findings of all efforts so far and identifies additional information that is needed.

At this time, the Kansas Water Office is also working with the Corps to develop the implementation plan, including the identification of funding needs and potential sources, as well as an estimated timeline for implementation of the on-lake demonstration. As recommended by the KWA, $1,500,000 in state funds has been requested in FY 2020 for implementation of the WID demonstration at Tuttle Creek Lake.

This item is for information only. No action is needed at this time.

Summary of Nonpublic Household Water Well Project Recommendations:

Improving and Protecting Water Well Quality

Thousands of Kansans rely on nonpublic water wells for their household, including providing water for drinking, cooking, bathing, household pets, and cleaning purposes. While approximately 70,000 nonpublic wells are registered in the state of Kansas to provide household water, the quality of the water is not guaranteed and may be contaminated from a range of environmental, industrial, and agricultural contaminants. Contamination of nonpublic water wells is far too common, and most well users are unaware that their water is not safe.

There are few protections at the state or local level to ensure that water from nonpublic water wells is safe. The recommendations (next page) seek to address this problem by providing concrete steps that, if taken, would provide increased protections for Kansans relying on nonpublic water wells for household use.

Project Background

The recommendations included here were compiled as part of the Nonpublic Household Water Well Project, a three-year project led by the University of Kansas School of Medicine-Wichita (KUSM-W) and funded by the Kansas Health Foundation. The purpose was to identify promising practices that could protect Kansans relying on nonpublic water wells for household purposes. The project team included public health and legal professionals with experience working on groundwater quality issues impacting nonpublic water wells in Kansas.

Research Process

The recommendations were identified through the following research and analysis processes:

- Review and analysis of Kansas state laws and county sanitary codes;
- Representative sampling and review of 24 Kansas city codes;
- Literature review to identify best practices in water quality management for nonpublic water wells;
- Dozens of key informant interviews to develop and evaluate proposed recommendations;
- A survey of more than 100 Kansas stakeholders to determine public health significance, feasibility of, and potential funding sources of proposed recommendations; and
- A survey of stakeholders to identify which organizations need to lead the implementation of each recommendation.

Key Partners and Organizations

The following organizations and partners contributed to the project by participating in key informant interviews, completing surveys, and/or providing feedback and technical assistance.

- Environmental Finance Center
- Groundwater Management Districts
- Kansas Association of Counties (KAC)
- Kansas Department of Health and Environment (KDHE)
- Kansas Environmental Health Association (KEHA)
- Kansas Farm Bureau
- Kansas Farmers' Union
- Kansas Geological Survey (KGS)
- Kansas Ground Water Association
- Kansas Legislature
- Kansas Public Health Association (KPHA)
- Kansas Rural Water Association
- Kansas State University (KSU)
- Kansas Water Office (KWO)
- Kansas Water Resources Initiative
- KDHE Certified Laboratories (Labs)
- League of Kansas Municipalities (KLM)
- Local Environmental Health Professionals (LEHP)
- Midwest Assistance Program
- Regional Advisory Committees
- United States Department of Agriculture-Rural Development
- Water Well Contractors and Drillers
- Water Well Owners and Users

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Nonpublic Household Water Well Project Recommendations

The following recommendations are organized according to the potential impact each recommendation could have on protecting public health, from greatest impact to least impact, as reported by survey respondents. The first recommendation was not ranked as the first priority; however, it is likely the first step that needs to happen chronologically.

#	Recommendations	Key Organizations/Lead Entities
1	Create a "Nonpublic Household Water Well" designation	KDA, KDHE, KWO, Legislature
2	Provide notice when specific groundwater contamination is found and when there is an event potentially impacting groundwater quality	KDHE, Legislature, LEHP
3	Establish triggering events to inspect wells and test water quality	KDHE, LEHP
4	Develop standardized water sampling and analysis protocol and form	KDHE, Labs, LEHP
5	Create a statewide group focused on advancing nonpublic water well quality	KDA, KDHE, KWO, Legislature
6	Revise the Kansas Dry Cleaner Environmental Response Act	KDHE, Legislature
7	Limit the use of some nonpublic household water wells	KDHE, KWO, Legislature, LEHP
8	Create funding mechanisms to offset costs of inspection, water quality testing, corrective action, and/or plugging of nonpublic water wells for those unable to pay	KDA, KDHE, KWO, Legislature
9	Establish a three-part process: permitting, inspection, and water quality testing	KDHE, KEHA, Labs, LEHP
10	Standardize environmental health professionals' training	KDHE, KEHA, LEHP
11	Track and provide information about abandoned wells in property transactions	KDHE, LEHP
12	Create standards to determine when connecting to a public water supply must be required	KAC, KDHE, KWO, Legislature, LEHP
13	Establish frequency of inspection and water quality testing after initial triggering event	KDHE, LEHP
14	Establish licensing requirement for the installation of water well pumps	KDHE, LEHP, Water Well Contractor/Driller
15	Update key nonpublic water well resources	KDHE, KGS, KWO, LEHP
16	Develop remediation training and certification standards	KDHE, KEHA
17	Update county sanitary codes	KAC, KDHE, LEHP
18	Assess interest in water well maintenance subscription service	KDA, KDHE, KEHA, KWO, LEHP, Water Well Contractor/Driller

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Nonpublic Household Water Well Recommendation #1:

Create a "Nonpublic Household Water Well" Designation

Proposed Action

Create a new designation of and definition for *nonpublic household water well* for use by KDHE and local county and city governments.

This designation would include all private, semipublic, and other active nonpublic water wells used for cooking, bathing, drinking, household pets, and other household purposes.

(Household purposes do not include water used for lawn and garden, irrigation, watering livestock, or nonpublic water wells that have been properly plugged or registered with KDHE as inactive.)

Potential Funding

No new funding is needed to implement this recommendation.

Background Information

Counties and cities across Kansas take a wide range of approaches in the terminology and definitions used for nonpublic wells, semipublic wells, and private wells.

Key categories of nonpublic water wells identified in Kansas county sanitary codes in 2018 include the following definitions:

- Nonpublic: General term that applies to all water wells that do not meet a federal or state public water source definition. Kansas state law defines a public water supply well as a water source that provides water to the public for human consumption, and has at least 10 service connections or serves an average of at least 25 individuals daily for at least 60 days during a calendar year.[1]
- Semipublic: Term used by some counties to create a sub-category of nonpublic water wells. The definition is usually based on the number of service connections and includes a range of anywhere from 2 to 9 service connections.
- Private: Term used by some localities that is inconsistently defined. It can be used as broad category similar to "nonpublic," or it can be used to make a distinction between the "semipublic" category and water wells with fewer service connections than used in a semipublic designation.

The current *nonpublic*, *private*, and *semipublic* water well designations do not indicate which nonpublic wells are used for *household purposes*.

Why This Action Is Needed

Regardless of the number of connections or individuals served by a well, everyone needs access to clean, safe water. Without consistent definitions, it is extremely challenging to protect private, semipublic, and nonpublic well users. Creating a category of "nonpublic household water wells" for the state, county and/or cities to use would provide a uniform approach that could:

- Serve as a basis for other county- and city-level efforts to support those using nonpublic household water wells, including inspection and water analysis recommendations and the availability of financial and technical resources for these well owners; and
- Support any remediation/correction actions if problems are identified.

[1] K.A.R. 28-30-2 (v).

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Nonpublic Household Water Well Recommendation #5:

Create a Statewide Group Focused on Advancing Nonpublic Water Well Quality

Proposed Action

1. Form a statewide group to address groundwater and nonpublic water well issues in Kansas. The group will include (but not be limited to) representatives from KDHE, KGS, local environmental health, KEHA, KDHE-certified labs, Kansas Groundwater Association, licensed water well contractors, Groundwater Management District Association, and agricultural groups such as Kansas Farm Bureau and Kansas Farmers' Union, among other potential partners. This group will sunset in five years. This group could be formally established through executive order of the governor, or by legislative action of the Kansas Legislature. The Kansas Water Office or KDHE could serve as the facilitator for this group.

2. Projects for the group will include, but not be limited to:

   a. Identifying funding for nonpublic water well initiatives;
   b. Workforce development for nonpublic water well experts;
   c. Feasibility of private or public entities providing subscription-type services and maintenance for nonpublic wells;
   d. Groundwater quality protection activities;
   e. Assessing the feasibility of using existing groundwater monitoring and observation wells to monitor groundwater quality; and
   f. Developing statewide databases, including:
      i. Enhancing the electronic statewide database to include additional nonpublic water well quality information on the WWC-5.
      ii. Developing a list and maps of active, abandoned, and inactive nonpublic water wells with addresses and property owner contact information.
      iii. Compiling groundwater quality information from monitoring wells.
      iv. Maintaining records of likely/probable (not known) sources of groundwater/aquifer contamination. Information about the potential sources of groundwater/aquifer contamination impacting the water quality of nonpublic water wells will include, but not be limited to the following:
         a) private wastewater systems (abandoned and active)
         b) active and former dry cleaners
         c) feedlots (CAFOs)
         d) underground storage tanks
         e) active and inactive mining operations
         f) hazardous waste sites
         g) oil wells and other industrial sites
         h) petroleum exploration and fracking
         i) grain elevators
         j) fertilizer plants
         k) chemical activities/facilities
         l) other local and regional vulnerabilities

Potential Funding

Funding to support this recommendation would most likely come from a combination of sources, including state funding through different funding streams and from nonpublic water well users.

Background Information

Nonpublic household water well owners and users, local and state environmental health professionals, and other community members relying on groundwater for household consumption do not have access to accurate, updated information about the groundwater quality or emerging groundwater quality trends that could impact public health. Some of this information exists in an unorganized, dispersed manner.

A number of groundwater monitoring wells exist across Kansas to monitor groundwater quantity. Many of these groundwater monitoring wells are developed and maintained by public/state entities, including KDHE and KDA. Some of these groundwater monitoring wells could be used to collect groundwater for water quality testing and analysis and monitor groundwater quality across the state.

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Maintaining information about groundwater quality testing and any emerging trends in a systematic, statewide database would allow nonpublic water well users and state and local environmental health professionals to identify any groundwater quality concerns and take proactive measures to protect public health.

Why This Action Is Needed

There are many public and environmental health issues relating to groundwater in Kansas. To address these issues adequately, it is necessary for organizations across Kansas to collaborate.

Consolidating information about groundwater quality and making it publicly accessible to those impacted by groundwater quality or those responsible for regulating this resource will better protect and manage groundwater resources and public health.

Nonpublic Household Water Well Recommendation #7:

Limit the Use of Some Nonpublic Household Water Wells

Proposed Action

1. Nonpublic household water well users will be prohibited from using a nonpublic water well for household purposes if the [local environmental health professional or other designated local official] determines that:
   - the well is in a contaminated area, and
   - the cessation or use of the water well for personal use is in the best interest of public health, safety and welfare, and
   - no water treatment system is in place to bring the water to acceptable water quality standards
2. No new permits or authorization to construct or reconstruct a nonpublic household water well will be issued if KDHE or the local environmental health professional determines that the well is in an area with contaminated groundwater that presents a risk to human health.

Potential Funding

No new funding is needed to implement this recommendation.

Background Information

The use of nonpublic water wells for household purposes may need to be restricted in areas that have been identified as having groundwater contamination that cannot be remediated and poses a risk to public health. In these situations, the local municipality should work with individual nonpublic water well owners and users to find alternative water sources.

Why This Action Is Needed

Water well contamination can occur from natural geologic sources and other local and regional sources of contamination (e.g., arsenic, agricultural pesticides, landfills, hazardous waste). In both urban and rural areas of Kansas, groundwater contamination has been discovered that poses a public health threat to nonpublic well users. In these situations, alternative water supply through point of use filtration and bottled water distribution can be implemented as short-term interventions; however, the most effective solution in these situations is to prohibit the use of existing wells, restrict the use of new wells, and provide public water supply to the impacted area.

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Nonpublic Household Water Well Recommendation #8:

Create Funding Mechanisms to Offset Costs of Inspection, Water Quality Testing, Corrective Action, and/or Plugging of Nonpublic Water Wells for those Unable to Pay

Proposed Action

1. Establish a fund to support nonpublic household water well owners/users to cover the costs of water quality testing, well inspection, and corrective action, and remediation. Distribution of available funds may be determined based on a sliding-scale fee or needs- based assessment. Funds made available to nonpublic household water well owners may include grants and interest-free loans for physical well repairs and water treatment.
2. Develop a Kansas-specific fund to provide grants, cost-sharing loans, or other incentives to support the plugging of abandoned wells. This fund may include a prioritization process and sliding scale structure for plugging of abandoned or inactive wells that pose the greatest threat to groundwater quality (offering amnesty from legal enforcement to achieve participation rates).

Potential Funding

Funding to support this recommendation would most likely come from a combination of sources, including: state funding, local and state taxes, nonpublic water well users, fertilizer and pesticide sales, and county mill levy/ property taxes.

Background Information

Nonpublic water well owners and users may not have their water quality tested, or wells inspected, remediated, or plugged due to the associated costs.

Why This Action Is Needed

Nonpublic water well users deserve to be able to access clean, safe water. If costs are the only barrier to allow nonpublic water well users to consume safe water, funds can be made available to cover some of the associated costs.

Additionally, wells that have not been properly plugged are a common source for groundwater contamination. The cost of plugging abandoned water wells is likely contributing to the failure of many property owners to follow the state law.

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Nonpublic Household Water Well Recommendation #12:

Create Standards to Determine when Connecting to a Public Water Supply Must be Required

Proposed Action

1. State or local governments in Kansas will have provisions within their platting for construction of new homes, subdivisions, and businesses that allow for current or future connection to a public water supply and other public services at the time they are available.
2. Local governments with a public water supply system can require connection to public water supply for all household properties within 150 feet of a public water supply.

Potential Funding

No new funding is needed to implement this recommendation.

Background Information

Some developers do not partner with municipal services prior to building. As a result, some developers have built homes (in rural, remote, and urban areas) that do not connect to public services and instead rely on nonpublic water wells for household purposes. In fact, these homes are often constructed in a way that does not allow for current or future connections to public services.

Why This Action Is Needed

The current practices are problematic as cities grow into what might have been previously designated as rural or remote areas. If contamination, such as the "Four Seasons Dry Cleaners" plume, is identified after the area has been developed, connection to municipal services is extremely expensive.

Additionally, to ensure the public's safety, municipalities dedicate considerable costs and time to maintain quality services. To maximize upon these municipal water supply efforts and ensure that residents within the city limits have access to clean and safe water, a city government can require property owners to connect to the public water supply if the property is within 150 feet of a public water supply. This was the case in west Wichita; some residents would have connected had this been in place.

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Nonpublic Household Water Well Recommendation #15:

Update Key Nonpublic Water Well Resources

Proposed Action

Local and state environmental health professionals, water well contractors, and geologists will review and update key resources for environmental health professionals, water well contractors, and nonpublic household water well users.

These tools will be consolidated into one document for professionals and a different document for nonpublic water wells owners/users. Thereafter, these resources will be re-examined every 15 years for relevance and needed updates. These resources will be approved by experts and distributed widely across the state.

Potential Funding

Funding to support this recommendation would most likely come from a combination of sources, including: state funding and fees, county mill levy/property taxes, and a percentage of fertilizer and pesticide sales.

Background Information

Issues impacting the physical structure of a well and water quality of nonpublic well water can be complicated and require technical information and skills that nonpublic water well owners and users do not have. In addition, Kansas environmental health professionals rely on four key resources for information about the integrity of the physical structure and the water quality of nonpublic household water wells.

The resources include:

1. Kansas State University Research & Extension, Environmental Health Handbook, Chapter I: Private Water Wells (Kansas Department of Health & Environment, 2nd ed. 2002), *available at:* http://www.kdheks.gov/nps/lepp/EHH_Ch_I_Private_Wells_052705.pdf
2. Kansas State University Research & Extension, Private Wells-Safe Location and Construction (2004), *available at*: http://www.kdheks.gov/waterwell/download/MF970-Private_Wells-Safe_Location_and_Construction.pdf
3. Kansas State University Research & Extension, Recommended Water Tests for Private Wells (1999), *available at*: http://www.kdheks.gov/waterwell/download/MF871-Recommended_Water_Tests_for_Private_Wells.pdf
4. KDHE Minimum Standards for Design and Construction of Onsite Wastewater Systems. http://www.kdheks.gov/nps/resources/mf2214.pdf

Why This Action Is Needed

These resources have not been updated for 15 to 20 years and do not include the latest technology and information about well construction and maintenance, groundwater quantity and quality, and other information. Moreover, key informants interviewed repeatedly identified having reliable and up-to-date technical information as critical in enabling local environmental health professionals to perform well.

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Nonpublic Household Water Well Recommendation #18:

Assess Interest in Water Well Maintenance Subscription Service

Proposed Action

1. Conduct an interest study to determine if a subscription service for nonpublic water well owners/users would be of interest. This type of service would ensure that nonpublic household water well users are able to access trained professionals to routinely offer installation, maintenance, testing, and remediation services, when needed.
2. Develop a list of regional and local contacts of individuals trained in nonpublic water well inspection, water quality sampling, and remediation of nonpublic water wells. This list will be provided to county health departments and made publicly available every year. This information will be maintained on a publicly-available website.

Potential Funding

Funding to support this recommendation would most likely come from a combination of sources, including: state funding, fees, and nonpublic water well users.

Background Information

Private (e.g., local business) or public (e.g., environmental health professional) entities are needed to provide the expertise to care for most aspects of well maintenance and potential risks/hazards near the well. Well owners/users need a clear resource to rely upon to ensure water quality.

Why This Action Is Needed

There are few visible nonpublic water well experts across many Kansas communities, and many nonpublic household well users do not have a clear resource/entity, private or public, to provide consistent well service and maintenance and ensure water quality standards are met. Interviews with key informants suggest that well owners often incorrectly apply filters, making the water less safe to consume. Moreover, key informants suggested that when well owners ask for help with their nonpublic water well in some communities, they are often referred to multiple agencies and the well owner can get frustrated with inconsistent messages and points of contact.

A subscription service for nonpublic wells could serve as a solid source of funding for local government or private entities, and it would allow for nonpublic well owners to feel confident that their nonpublic well will be safely managed throughout the period of the subscription service.

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MEMO

DATE: December 13, 2018
TO: Kansas Water Authority
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As previously presented and discussed by the Kansas Water Authority (KWA), a research coordination workgroup has continued to meet to identify priorities for research needed to support implementation of the Vision. No action is being sought at this time.

Efforts focused on the specific areas of research previously identified by the group have continued, which include streambank stabilization effectiveness, irrigation technologies and crop genetic research, and harmful algal blooms. At the last meeting, each of the small research teams focused on these specific research areas updated the workgroup on current activities and discussed what key questions still need to be answered. Agency personal from the U.S. Army Corps of Engineers (USACE) were able to participate, providing input into ongoing activities that they help coordinate.

The development of a Water Research Newsletter, *Research on Tap*, was also discussed at the last meeting. KWO will compile ongoing water-related research from universities and disseminate the newsletter once a quarter, which will also be posted on the Water Research Coordination Workgroup webpage on KWO's website.

No action is needed at this time. Information is provided for discussion purposes only.