

SIGN IN SHEET

Proposed Regulations

K.A.R. 5-12-1 / K.A.R. 5-1-1 / K.A.R. 5-25-21 / K.A.R. 5-22-7

Division of Water Resources regulations

January 11, 2016, 10:00 a.m.

1320 Research Park Dr., Manhattan, Kansas

Satellite Call at the Stafford Field Office, 300 S. Main Street, Stafford, Kansas

No.	Name	Representing	Comment (Written or Oral)	Which regulation are you commenting on? ASR / GMD 2 / GMD 5
1	Don Henry Joe Pagan	City of Wichita	written	ASR ✓
2	Dennis Gruenbaker	Sedgewick County Farm Bureau	Oral	ASR ✓
3	Margaret Goring	Harvey County Farm Bureau	Oral	ASR ✓
4	Kent Winter	self	Oral & Written	ASR ✓
5	Denise Middleton	Self	ORAL / WRITTEN	ASR ✓
6	Kurt Beckert	self	oral	ASR ✓
7	JACK BENDON	HARVEY CO.	ORAL	ASR ✓
8	PHIL KIMMERA	Harvey Co	oral	ASR ✓
9	SUZANNE LOOMIS	City of Newton	oral	ASR ✓
10	Brian Bednarek	Research		RFC
11	Tim Boese	GMD 2	oral & written	ASR & GMD 2 ^{-oral} _{01/11}
12	Matt Ulrich	KWO		
13	Carolyn McGinn	State Senate		
14	John Weber		oral	GMD-2 ✓
15	Jack Queen	Farmers Coop Holstead	oral	GMD-2
16	Dwight Lorenz		Oral	GMD-2 none
17	Ryan Spore			GMD-2
18	Robert Elliott			GMD-2
19	Bob Hardy			GMD-2
20	Jeff Littleton			GMD#2 BOARD
21	Michael McGinn		ORAL	GMD#2 BOARD ✓
22	Carin E. Kissick	self	oral	ASR ✓
23	Chris Feightel	KDA-DWR		
24				
25				
27				
28				

EXHIBIT

7

Intervenors

PENGAD 800-631-6388

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Division of Water Resources regulations

January 11, 2016, 10:00 a.m.

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Satellite Call at the Stafford Field Office, 300 S. Main Street, Stafford, Kansas

No.	Name	Representing	Comment (Written or Oral)	Which regulation are you commenting on? ASR / GMD 2 / GMD 5
29	<i>Karma Mason</i>	<i>KWA</i>	—	—
30	<i>Robert Lorge</i>	<i>RDA</i>		
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Proposed Regulations

K.A.R. 5-12-1 / K.A.R. 5-1-1 / K.A.R. 5-25-21 / K.A.R. 5-22-7

Division of Water Resources regulations

January 11, 2016, 10:00 a.m.

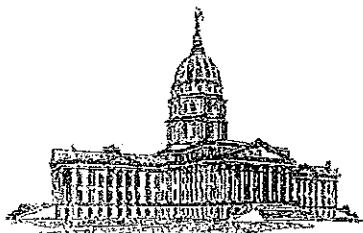
1320 Research Park Dr., Manhattan, Kansas

Satellite Call at the Stafford Field Office, 300 S. Main Street, Stafford, Kansas

No.	Name	Representing	Comment (Written or Oral)	Which regulation are you commenting on? ASR / GMD 2 / GMD 5
1	Oran Feril	GMD # 5	ORAL	GMD 5
2	Eddie Weber	Farmer GMD # 2	ORAL	GMD 2
3	Juan Clark			
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STATE OF KANSAS

RANEY L. GILLILAND
Director
MELISSA S. CALDERWOOD
Assistant Director for Research
J. G. SCOTT
Assistant Director for Fiscal Affairs
AMY DECKARD
Assistant Director for Information Management



STAFF
LEGISLATIVE COORDINATING COUNCIL
INTERIM COMMITTEES
STANDING COMMITTEES
LEGISLATIVE INQUIRIES

KANSAS LEGISLATIVE RESEARCH DEPARTMENT

Room 68-West — State Capitol Building — 300 SW Tenth Avenue — Topeka, Kansas 66612-1504
PHONE (785) 296-3181 ♦ FAX (785) 296-3824 ♦ TTY (785) 296-3877
INTERNET: <http://www.kslegislature.org/kldr> E-MAIL: kslegres@kldr.ks.gov

November 25, 2015

David W. Barfield, Chief Engineer
Division of Water Resources
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502

WATER RESOURCES
RECEIVED

NOV 30 2015

KS DEPT OF AGRICULTURE

Dear Chief Engineer Barfield:

At its meeting on November 16, 2015, the Joint Committee on Administrative Rules and Regulations reviewed for public comment rules and regulations concerning KAR 5-1-1, definitions; KAR 5-12-1, aquifer storage and recovery permitting; KAR 5-22-7, safe yield; KAR 5-25-21, alternative method for calculating the amount of water deposited in a multiyear flex account. After discussion, the Committee had the following comment.

KAR 5-22-7. The Committee suggests the new language in paragraph (a) (5)(C) concerning well spacings near the North Fork of the Ninnescah River be separated from the existing language so this new requirement is not confused with the language regarding McPherson County.

Prior to filing with the Secretary of State, review the history sections of the rules and regulations to update them to the most recent statutory citations, making certain the citations for authorizing and implementing statutes are correct and complete. Please indicate your agency's website address in the filing notice where proposed regulations can be located. In addition, if your agency accepts written comments by e-mail include this information in the public notice. Further, e-mail requests for public accommodation should be included as a part of the notice. Finally, verify that the adoption by reference of any materials included in the regulations is properly completed as prescribed in the Policy and Procedure Manual for the Adoption of Kansas Administrative Regulations.

Please make this letter a part of the public record on these regulations. The Committee will review the regulations the agency ultimately adopts, and reserves any expression of legislative concern to that review.

To assist in that final review:

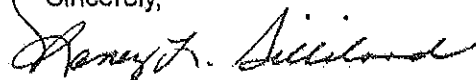
Please inform the Joint Committee and me, in writing, at the time the rules and regulations are adopted and filed with the Secretary of State, of any and all changes that have been made following the public hearing. Please notify the Joint Committee and me, in writing,

when your agency has adopted the regulations as permanent; delayed implementation of the regulations; or decided not to adopt any of the regulations.

Also, please indicate separately to the Joint Committee and me, any changes made to the proposed regulations reviewed by the Committee.

Based upon direction from the Committee, failure to respond to each and every comment contained in this letter may result in the request that a spokesperson from your agency appear before the Committee to explain the agency's failure to reply.

Sincerely,



Raney L. Gilliland
Director

RLG/db

WATER RESOURCES
RECEIVED

NOV 30 2015

KS DEPT OF AGRICULTURE

Hutton, Ronda

From: Roger & Carol Black <blackfarms@gmail.com>
Sent: Wednesday, January 06, 2016 6:50 AM
To: Hutton, Ronda
Subject: KAR5-12-1

In reference to KAR5-12-1: I am Roger Black, a member of the Equus-Walnut RAC. Should any pumping below 1993 levels be on condition that Wichita has exhausted their water in Cheney and be using all El Dorado can supply and this does not meet 95% of Wichita's needs. Then they could draw down the equus beds all the way to bedrock, if needed. Issues include, but not limited to, enhanced salt plume invasion of depleted equus beds and the rights of senior right-to-divert by other cities and irrigators. Should a plan be developed to provide desalinated water to the communities and irrigators that would be negatively impacted by a potentially enhanced salt plume in the event the equus beds are pumped to bedrock? Who would pay for it? Developing a strategy to deal with severe drought is a region wide responsibility. I hope to discuss this with you at the next RAC meeting.

Roger Black
16672 US 166
Arkansas City, KS 67005
620-550-1256

Hutton, Ronda

From: Dan A <zoomermach1@gmail.com>
Sent: Thursday, January 07, 2016 2:41 PM
To: Hutton, Ronda
Subject: Proposed rules

Ronda,

Guess you are the one to hear all the jabber regarding the proposed Equus Beds rule changes. If I'm interpreting it correctly it in effect literally leaves agriculture high and dry while allowing the city to use till its dry. That may be a bit overstated but that is how it reads to me. Ag by its very nature leans and practices conservation. It's required to maintain profitability and survive. So I'm a big NO on this change.

Thank you,

Dan Andrew
Sedgwick, KS
316-283-1776

Sent from my Verizon Wireless 4G LTE smartphone

Hutton, Ronda

From: #Harvey County Farm Bureau <harveyfb@kfb.org>
Sent: Saturday, January 09, 2016 7:30 PM
To: Hutton, Ronda
Subject: Comments on K.A.R. 5-12-1

January 8, 2016

To the Secretary of Agriculture;

The Harvey County Farm Bureau Associations board of directors are strongly opposed to the K.A.R. 5-12-1 in conjunction with K.A.R. 5-1-1 administrative regulation. We feel by allowing the City of Wichita to utilize recharge credits when water levels in the Groundwater Management District #2 are below the historical level of 1993 will:

1. Allow the movement of the noted salt plume in the Burrton area further east into not only the City of Wichita's well area but also into other municipal water systems relying on the GMD #2 aquifer for their total water needs. This will affect several small communities east of the noted salt plume area besides the agricultural permitted water right users in this same area.
2. Compromise the GMD #2 aquifer noted for its reliable quantity and quality source of water.

The 1993 water levels were put into place for a reason and should be strictly part of any regulation. These 1993 levels were a part of the original permit regulations that was set up by and agreed to by DWR, City of Wichita, and Groundwater Management District #2.

We are also appalled that a local governing body, the GMD #2 Board, was not allowed to be a part of the decision making as this directive regulation came directly from the Chief Engineer of the Kansas Division of Water Resources.

Thank you for taking in consideration our position on this regulation.

Sincerely

Harvey County Farm Bureau Association

Margaret Goering
Mike Hiebert
Tyler Westerfield
Andi Hamm
Dedee Lehman
John McCurry
Josh Mueller
Cindy Siemens
Aaron Vogts

Carole Schlender

County coordinator
Harvey County Farm Bureau Association

PO Box 126
305 N. Meridian
Newton, Kansas 67114
16-284-2123
harveyfb@kfb.org
harveyfb.org

January 8, 2016

To the Secretary of Agriculture;

The Harvey County Farm Bureau Associations board of directors are strongly opposed to the K.A.R. 5-12-1 in conjunction with K.A.R. 5-1-1 administrative regulation. We feel by allowing the City of Wichita to utilize recharge credits when water levels in the Groundwater Management District #2 are below the historical level of 1993 will:

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We are also appalled that a local governing body, the GMD #2 Board, was not allowed to be a part of the decision making as this directive regulation came directly from the Chief Engineer of the Kansas Division of Water Resources.

Thank you for taking in consideration our position on this regulation.

Sincerely

Harvey County Farm Bureau Association

Margaret Goering
Mike Hiebert
Tyler Westerfield
Andi Hamm
Dedee Lehman
John McCurry
Josh Mueller
Cindy Siemens
Aaron Vogts

January 9, 2016

The Kansa Water Authority

To Whom It May Concern:

The proposed regulation to let the city of Wichita pump the equus bed groundwater to bedrock in time of drought is irresponsible. To undo years of planning and recharging to protect the equus beds then to lose it in a time period of one or two years. This proposal to start with is undoing several things the city and ground water district 2 agreed to. First not to pump below the 1993 levels, the ASR project was to pump river water directly into the aquifer for the recharge project only, not to be pumped directly to the city of Wichita for their water usage. Pumping below 1993 levels would jeopardize all the progress that has been made to stave off the advancement of the Burrton salt water plume. The city has done much to remedy this situation by pumping vigorously out of Cheney Lake conservation pool and ASR project.

Kansas Water Authority seems to be looking out more for the City of Wichita than the integrity of the equus bed. Much effort has been put forth to this protect, but is this one government agency scratching the back of another. The city of Wichita as all its water needs met. It can expand its water usage by taking on more customers or larger areas to provide water to.

Thank you for your cooperation and please make the right decision not to jeopardize the eques beds.

Sincerely,

Dave Bogner

Don Bogner

Duane Bogner

Hutton, Ronda

From: Joseph Trego <tregoj8712@hotmail.com>
Sent: Sunday, January 10, 2016 2:03 PM
To: Hutton, Ronda; Ruth
Subject: proposed changes to water regulations

I have great concerns with the City of Wichita wanting to pump the aquifer to bedrock. I worked for the City of Wichita in the well field near Halstead in the 70's and know how much water was consumed then. In 1984 I stated work in the agriculture irrigation industry working on center pivots and irrigation pumps in the same area. I worked in this industry for 25 years and feel I have a lot of insight. The City of Wichita has been very aggressive in the water in the water " business". They have signed contracts with 6-7 smaller cities and towns to provide them with water. They can now no longer fill these contracts with their allotted amount of water.

Their recharge efforts north of Halstead along the Little Arkansas river have largely have been a failure and mostly abandoned , except for the bank storage which they are simply moving water from one well to another and calling it recharge. The new recharge south of Sedgwick is working but not to expectations. They do process a high volume of water when the Little Arkansas is flowing above it's normal rate but not enough to cover their needs.

The City of Wichita's engineers claim that the Equis Beds are full but I disagree with that statement. They have maintained the static level or even increased it slightly. The sand formation is still exposed above the current static level . There could be another 20-40 added to the static level. Some of this increase in static level can be contributed to rainfall and increased efficiency in irrigation and farming techniques. If the static level was full as was in 50's before the Wichita well the Kiswa Creek that flows through the area would be flowing again. It was spring fed from the aquifer.

There is a salt plume west of the Wichita pumping area that is a result of oil field production in the 20's and 30's. By allowing Wichita to pump more water this would create a void and allow the salt water to migrate into the area. The salt migration was moving in years past but the conservation effort recently have kept it static.

If Wichita was allowed to pump the water to bedrock this would destroy the economic situation of the local situation. First of all most of the ag wells aren't as deep as the Wichita wells. So lowering the static level would deny access to the water to some farmers. The farmers with deeper wells would have greatly increased pumping cost and so electric pumps couldn't handle the increased load. Back in the 50's the City of Wichita had to redrill practically all the domestic wells in the area because of the agreement they made with local land owner. I don't think would do that again.

The City of Derby and Mulvane both missed out on getting their own water field back in the late 80's when the City of El Dorado abandoned their well field on the south edge of Mulvane. It was already set up when El Dorado opted to get water from the new reservoir. This was poor planning on Mulvane and Derby's part. Now they want to penalize this area for their poor planning.

Gov. Brownback gave a speech on water conservation and the effort the state was going to make in this direction. I don't feel this is any way allowing this new proposal to happen is conservation. I think we are at a maintainable water level in this area. I think increased conservation efforts need to be made to increase volume and water quality.

thank you for your time

Joe

Trego ps
Edgar Trego, the man for whom Trego county is named for.

Yes I am a decedent of the

316 641 6130

January 9th, 2016

Kansas Department of Agriculture
Division of Water Resources
1320 Research Park Dr
Manhattan KS 66502

RE: K.A.R. 5-12-1 and K.A.R. 5-1-1 proposals

Dear DWR,

I would like to publically oppose the proposed changes to resolutions listed above – as a lifelong rural resident in the Equus Beds Groundwater Mgmt District #2. (I'm sorry my comments are submitted late – I didn't learn of these proposed changes until this weekend).

From the document outlined in the Kansas Register about these changes, aspects of these regulation changes become apparent:

- The changes are contrary to the spirit and purpose of the ASR recharge project, which is to maintain a safe level of groundwater in the aquifer during times of drought for all users, and to prevent its depletion below a specific maintainable level.
- The changes give the City of Wichita the power to usurp all other water-use parties, and to pump the aquifer dry (to bedrock) during low water times. (K.A.R. 5-12-1 ...*The proposed changes to K.A.R. 5-12-1 would allow the minimum water level to be defined by the bedrock elevation as opposed to the current definition of the water level that occurred within 10 years prior to the application filing...*) By allowing "recharge credits" that they can then use during "during critical dry periods", the resolution is giving preferential treatment to City of Wichita useage over all other water users.
- Your department, and the Governor, has advocated for water conservation across the state, as it pertains to our groundwater supply. These changes appear to be in direct opposition to that vision.

I ask that you reconsider and reject this proposal requested by the City of Wichita. Please realize its impact on the aquifer itself and all other rural water users throughout the state.

Thank you,

Tracy Pribbenow
11301 N. 215th St. W.
Sedgwick KS 67135

Cc: Governor Sam Brownback

Hutton, Ronda

From: Greg Mies <gmies@bradmurrayinc.com>
Int: Sunday, January 10, 2016 9:45 PM
To: Hutton, Ronda
Subject: wichita asr

To whom it concerns

I am writing to ask for your support in opposing changes to K.A.R. 5-1-1 and K.A.R. 5-12-1, regulations proposed by the Chief Engineer of the Kansas Division of Water Resources, David Barfield. These changes affect Wichita's artificial recharge project and the well owners in the Wichita well field in the Equus Beds.

These changes will make a drastic change to the rules (permit regulations) that were set up by and agreed to by DWR, City of Wichita, and Groundwater Management District #2. The four main concerns of well owners in the areas of the artificial recharge project when it was proposed by the City of Wichita were addressed in the permit for the Aquifer Storage and Recovery program (ASR) and are as follows:

1. Not to pump groundwater with the Bank Storage Wells.
 - This means the city had to use water from an above-baseflow stage of the river to recharge the aquifer, and not pump groundwater from their Bank Storage Wells for this purpose.
2. To recharge the aquifer with water pumped from the river and bank storage wells.
 - The Chief Engineer has already negated this by a ruling and allows Wichita take water directly without recharging, if they choose.
3. Not to degrade the quality of water in the Wichita well field area and slow down the movement of the Burrton Salt Plume.
 - Slowing the Burrton Salt plume was one of the major selling points made by the city when proposing ASR. This proposed regulation change would seem to completely negate this goal, in that removing water to bedrock would create a void and vacuum that would allow the Burrton Salt Plume to move in at a much higher rate.
4. When recharge credits are used to supply water to Wichita they are not allowed to pump the water levels down in the Aquifer below the historical low levels that were recorded in 1993.
 - This is what the Chief Engineer is trying to change.

Wichita has started recharging water to the aquifer, they have only recharged enough water to supply the city's needs for approximately 10 days at peak use. The ASR will not meet their needs. This change could have the effect of leaving only one of the original four main concerns intact.

This proposed regulation change by the Chief Engineer would allow Wichita, when needed, to use recharge credits to pump water out of the aquifer in their area to bedrock (which basically means dry) harming and impairing all other water users in that area. Governor Brownback and the state's water vision is talking conservation across the entire state. This is does not follow those lines of thought in any way.

Greg Mies Farms

316-648-3163
gmies@bradmurrayinc.com



This email has been sent from a virus-free computer protected by Avast.
www.avast.com

Hutton, Ronda

From: Dan Prohaska <danprohaska@gmail.com>
Sent: Sunday, January 10, 2016 10:24 PM
To: Hutton, Ronda

To Whom it may concern regarding DWR reg changes,

I am unable to attend the hearing that is scheduled so am writing so my interest can be known.

I am writing to discuss opposing changes to K.A.R. 5-1-1 and K.A.R. 5-12-1, regulations proposed by the Chief Engineer of the Kansas Division of Water Resources, David Barfield. These changes affect Wichita's artificial recharge project and the well owners in the Wichita well field in the Equus Beds. I own property east of Mt Hope and these changes may directly affect my agricultural practice.

These changes change the game that was agreed to by the DWR, City of Wichita, and Groundwater Management District #2. These changes are not for the better in my opinion and want to discuss why in the following discussion. The four main concerns of well owners in the areas of the artificial recharge project when it was proposed by the City of Wichita were addressed in the permit for the Aquifer Storage and Recovery program (ASR) and are as follows:

1. Not to pump groundwater with the Bank Storage Wells.
 - This means the city had to use water from an above-baseflow stage of the river to recharge the aquifer, and not pump groundwater from their Bank Storage Wells for this purpose.
2. To recharge the aquifer with water pumped from the river and bank storage wells.
 - The Chief Engineer by his own direction has changed this allowing the city to pump from the bed without recharge if it deems it wants to.
3. Not to degrade the quality of water in the Wichita well field area and slow down the movement of the Burrton Salt Plume. **This is a prime source of concern, as my well already has higher salt content, causing the need to treat the soil with gypsum to address pH concerns.** If the Burrton plum extends, and my water has higher salt content it may not be fit to irrigate with without ruining the soil, or damaging crops.
 - Slowing the Burrton Salt plume was one of the major selling points made by the city when proposing ASR. This proposed regulation change would seem to completely negate this goal, in that removing water to bedrock would create a void and vacuum that would allow the Burrton Salt Plume to move in at a much higher rate.
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 - This is what the Chief Engineer is trying to change. This may not seem like a concern at the present time with water tables high, but when drought returns this will become a significant concern!

The city has been taking a higher percentage from Cheney Lake, as the lake has been above conservation pool. Combined with better rainfall and less demand from agricultural use related to the rainfall, there has been less demand and the aquifer is nearly full. However, since Wichita has started recharging water to the aquifer, they have only recharged enough water to supply the city's needs for approximately 10 days at peak use. The Aquifer Storage Recovery will not meet their needs. This change could have the effect of leaving only one of the original four main concerns intact.

This proposed regulation change by the Chief Engineer would allow Wichita, when needed, to use recharge credits to pump water out of the aquifer in their area to bedrock (which basically means dry) harming and impairing all other water users in that area. Governor Brownback and the state's water vision is talking conservation everywhere else but here. The Chief Engineer should be brought to a hearing and asked why he is not following the same tract as other areas of the state?

Thank you,

Dan Prohaska
800 N. St. Andrews St.
Wichita, KS, 67230

316-207-7227

Hutton, Ronda

From: Terry Jacob <4952terry@gmail.com>
Sent: Monday, January 11, 2016 8:07 AM
To: Hutton, Ronda
Subject: Fwd: Fw: DWR

----- Forwarded message -----

From: Bruce Seiler <brucebleedsgreen@yahoo.com>
Date: Mon, Jan 11, 2016 at 6:50 AM
Subject: Fw: DWR
To: Terry Jacob <4952terry@gmail.com>, Bobby Seiler <seicows@gmail.com>

Terry, Bob

Here is another response letter to send on from one of my landlords. Should we plan to be there for this weeks meeting?

Bruce

From: Dan Prohaska <danprohaska@gmail.com>;
To: <ronda.hutton@kda.ks.gov>;
Sent: Mon, Jan 11, 2016 4:24:08 AM

To Whom it may concern regarding DWR reg changes,

I am unable to attend the hearing that is scheduled so am writing so my interest can be known.

I am writing to discuss opposing changes to K.A.R. 5-1-1 and K.A.R. 5-12-1, regulations proposed by the Chief Engineer of the Kansas Division of Water Resources, David Barfield. These changes affect Wichita's artificial recharge project and the well owners in the Wichita well field in the Equus Beds. I own property east of Mt Hope and these changes may directly affect my agricultural practice.

These changes change the game that was agreed to by the DWR, City of Wichita, and Groundwater Management District #2. These changes are not for the better in my opinion and want to discuss why in the following discussion. The four main concerns of well owners in the areas of the artificial recharge project when it was proposed by the City of Wichita were addressed in the permit for the Aquifer Storage and Recovery program (ASR) and are as follows:

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- Slowing the Burrton Salt plume was one of the major selling points made by the city when proposing ASR. This proposed regulation change would seem to completely negate this goal, in that removing water to bedrock would create a void and vacuum that would allow the Burrton Salt Plume to move in at a much higher rate.
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Thank you,

Dan Prohaska
800 N. St. Andrews St.
Wichita, KS, 67230

316-207-7227

Dr. Jackie McClaskey
Kansas Secretary of Agriculture
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, KS 66506

Dear Secretary McClaskey,

The members of the Sedgwick County Farm Bureau Board are extremely concerned with the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1, most importantly removing the minimum index water level. This is one of the key tenets of the ASR agreement between the city of Wichita, GMD #2, and DWR. An action this drastic would most certainly impair not only irrigation, but domestic, livestock, and municipal wells within the horizontal boundaries of the ASR areas.

A second result would most likely be a degradation of the quality of water in the ASR by creating a void and vacuum, allowing the Burrton Salt Plume to move south and east at an accelerated rate. Another main tenet of ASR was to prevent and slow this event. Can the Chief Engineer explain how such an important provision and safeguard to the protection of the aquifer be disregarded?

Also of great importance in the event the ASR is drawn to bedrock, does DWR have any studies showing that areas of the aquifer outside the horizontal boundaries of the ASR will be completely unaffected?

Under Kansas state law, water rights are considered personal property. The horizontal boundaries of the ASR are not a closed system. It seems to us that drawing the aquifer to bedrock would undoubtedly adversely affect these water users and rights within the aquifer and also outside the horizontal boundaries of the ASR. With this being a change in state regulation, are we to assume that the Chief Engineer would be comfortable with drawing down other basins in the state to the same level should there be future artificial recharge projects?

Respectfully,

The Sedgwick County Farm Bureau Agricultural Association

Max Tjaden, President

Joseph Youngers, Vice President

Peggy Hill, Secretary/Treasurer

Byron Wells, Board of Director

Rhonda McCurry, Board of Director

Kevin Kohls, Board of Director

Todd Kissinger, Board of Director

Kent Ott, Board of Director

William Carp, Board of Director

Brian Wetta, Board of Director

To whom it may concern,

As a young farmer in north west Sedgwick county Kansas I am asking you to not make changes to affect the farmers within the equus beds water table. It is imperative that we continue with our watering abilities what little we do have. We as farmers already are restricted enough on our watering abilities.

A few years back you may recall the drought in which we had. It affected the cities water supply enough to where there was a shortage of water. As farmers we had to completely abandon watering our crops due to pumping to our allocated allotment. Once we reached that allotment we were forced to stop pumping water which in turn made our crops suffer and not produce ultimately resulting in a loss of profit. It was sickening to me to drive into Wichita and see sprinkles watering pavement and pumping water day in and day out to keep yards green. How do you think we as farmers felt seeing grass green and our crops brown and profits withering.

Instead of hurting us as farmers I feel you should be managing your local cities water laws. During rainy days it's common to see sprinklers watering lawns. Why? Well of course you love to see that because its profit. However we see it as a waste and a time to preserve water. Put your restrictions to people who use your water not people who live off your water and feed the countries growing population.

I disagree strongly with what you are doing to the equus beds water table for your use.

ANK llc

BNC Farms

Rita Landweher

Alvin Neville

Office of the President

January 8, 2016

Secretary of Agriculture
1320 Research Park Dr.
Manhattan, KS 66502

**COMMENTS FOR SUBMISSION
PROPOSED REGULATIONS K.A.R. 5-1-1
AND K.A.R. 5-12-1**

Kansas Farm Bureau (KFB) has concerns about the agency's proposed addition to K.A.R. 5-1-1(uu) and modification of K.A.R. 5-12-1(b)(2), as they relate to the changes in the delineation of the basin storage area for the Wichita Aquifer Storage and Recovery (ASR) project.

We know the permits issued for the Wichita ASR project are extremely technical and conditioned in a manner so as to attempt to provide, among other things, a more reliable long term water supply for Wichita and to protect the public interest by establishing a freshwater barrier against the migration of a salt plume.

At the time the ASR proposal was initiated, the Equus Beds aquifer was already mature in water right development; consequently, extraordinary consideration to the impacts caused by the operation of ASR had to be factored in before approval could be granted. Concessions and promises were made to help address the needs and concerns of all water users before the ASR permits were issued. The proposed regulation amendments to the basin storage area threaten these long-standing safeguards.

We understand the need for Wichita to seek a reliable long term water supply; however, due consideration must be given to the public interest risk caused by amending the pumping level restrictions. There are cyclical impacts caused by drought and heavy water use but throwing caution to the wind by allowing the most recent water development project (ASR) to exacerbate this situation is counter to our water law doctrine, much of the 50-year water vision, and is not in the public interest.

The Equus Beds GMD #2 is the local management unit with representation from various water users. Has their input been sought and heavily weighted in this proposal to amend the regulations that could dramatically impact the aquifer in ways that go counter to original agreed-upon definitions and safeguards?

The public notice states "the City has requested the revision to allow for withdrawal of recharge credits when they are available and remove the restrictions limiting recharge credit withdrawal when levels are above the 1993 index water level". When the chief engineer originally conditioned the permits, it was agreed that these credits would only be available when above the 1993 index water level. There must have been good reason for that definition and those conditions.

And finally, ASR projects will differ based upon the local geology, hydrology and objectives for the project. The amended definitions proposed in these regulations may not be universal. In this case, we have a GMD with local expertise and interest which should be relied upon for making such dramatic and potentially harmful changes.

We strongly urge the agency not to adopt these proposed regulations.

Sincerely,

A handwritten signature in cursive script that reads "Richard Felts".

Richard Felts, President
Kansas Farm Bureau

Dr. Jackie McClaskey
Kansas Secretary of Agriculture

January 11, 2016
Manhattan, KS

Dear Secretary McClaskey,

My name is Kent Winter of Mt. Hope, Kansas in Sedgwick County. Thank you for this opportunity to provide comments on the proposed changes to K.A.R 5-1-1 and K.A.R. 5-12-1.

I stand in opposition to the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1.

I am a 5th generation Kansas farmer, with Sedgwick County roots going back to May 1872, when my maternal great-great grandparents stepped off the first train into Wichita. Many stories, many experiences, and many observations have been passed down to me over the years regarding the city vs. rural clashes over property rights and shared resources, such as water.

The proposed changes, with the implied threats of impairment and harm to rural water are alarming and unacceptable. It was my impression that lot of man hours, thoughtful discussion and sound science went into developing the existing water regulations that both sides could live with. The proposed changes are akin to "moving the goalposts" and may damage the integrity and trustworthiness of the responsible parties. I am asking you to withdraw the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1.

Kent Winter
Mount Hope, Kansas

*142) standard
Boop*

Lower Arkansas

Introduction:

Calvin Kissick Member of KWA, Board of GMD#2, Previously Equus-Walnut RAC / *BAC*
Testifying as Citizen-GMD#2 Member
Holder of Ag Water Rights and Resident of Wichita

Good Management Policies of Wichita Water Management/GMD #2 locally

Good Support/working relationship with GMD#2

Helped maintain a "sustainable" groundwater supply for Agriculture, Industrial and Municipal users for over 40 years. (Only two in the State)

Wichita Well field is over appropriated but has been managed well

Reduced withdrawals from Equus Beds - Increased use of Cheney Reservoir

Worked closely with Board developing ASR policies and MOA^{u.}

Agreed to develop barrier to slow salt water movement from Burrton Oil Field

KAR. 5-1-1

K.A.R. 5-12-1 Change to allow ASR withdrawals to Bedrock elevation vs predetermined level

→ Governors Vision Statement for the Future Water Supply in Kansas

*All
- Helped Develop
- RAC continue to implement goals
- Citizens*

Envisions a balance of Social & Economic Growth for next 50 years.

Emphasizes local driven solutions for success (pg. 10)

Policies should not unintentionally penalize those demonstrating good stewardship with water resources.

→ State-Wide change of ASR Policy appears to be in direct conflict with Governor's Vision Statement

Appears to be a "quick/low cost" attempt to secure water supply in drought conditions

Penalizes those demonstrating good stewardship of groundwater resources.

*Adopt By chs
- PP Redesign Chy.
- KAR 5-22-1*

Alternatives are available that support the Governor's Vision

Underutilized resources in the area are available. (El Dorado Reservoir)

Management officials would like to further develop the reservoir and work with Wichita to help with their future drought planning



*- Can pump existing rights to Bedrock
- Public Pressure = This change would "institutionalize" pumping to Bedrock*

MOA

Members developed to protect the aquifer is overridden

More important: Members Trust in working relationship will be "broken" - *Strained*

History has shown that solutions can be developed if local entities can work together

Recommendation:

Reconsider--
Temporally withdraw proposed change in K.A.R. 5-12-1

Allow a period of time for City/GMD#2 to work on a local solution for changes

To Whom It May Concern,

RE: K.A.R. 5-1-1 and K.A.R. 5-12-1

As a concerned citizen, Cowley County Farm Bureau member, livestock producer and one who lives upstream from a public drinking water supply, I am sensitive to issues regarding natural resources and water quality.

Fortunately, for the most part where I live within this region, I/we have access to an abundance of protected surface water. I am not dependent on the Equus beds for my needs. I do however know many who are.

Over this last year I have attended a multitude of public meetings regarding our regions water issues where often the topic was the Wichita ASR project and the Equus Beds. Over the years I have followed that project from the start with interest. The balance of use, artificial manipulation and protection of maintaining that resource is of grave concern to our state and the many whose lives it supports. Sustainability was and is an important role in the ASR project.

I understand with this project there were checks and balances put in place and agreed upon at the time, to protect the aquifer as well as multiple users. I don't understand why there is a proposal that puts those checks and balances in jeopardy.

I applaud the City of Wichita's pro-active measures to insure a safe water supply for their citizens with the ASR project but, it should not be at the expense of other users of this limited resource.

If we are going to tackle the future water needs of our region, it certainly needs to be discussed with regional objectivity and everyone at the table.

At this time I oppose this proposal. K.A.R. 5-1-1 and K.A.R. 5-12-1

Thank you

Denise Middleton

EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2

313 Spruce Street

Halstead, Kansas 67056-1925

Phone - 316 835-2224 Fax - 316 835-2225

Email - equusbeds@gmd2.org

Equus Beds Groundwater Management District No. 2

Testimony Before the

Chief Engineer, Division of Water Resources, Kansas Department of Agriculture Concerning Modifications to the Aquifer Storage and Recovery Permitting Requirements By Modifying K.A.R. 5-1-1 & K.A.R. 5-12-1

By

Tim Boese, Manager

January 11, 2016

On behalf of the Board of Directors of the Equus Beds Groundwater Management District No. 2 (District), I wish to thank the Chief Engineer for the opportunity to provide testimony opposing the proposed modifications to the Aquifer Storage and Recovery (ASR) permitting requirements by modifying K.A.R. 5-1-1 and K.A.R. 5-12-1.

The District Board of Directors, by approved motion, opposes the proposed modifications to K.A.R. 5-1-1 and K.A.R. 5-12-1. The modifications propose to change the bottom vertical extent of an ASR basin storage area from a determined historical minimum water level elevation to bedrock elevation or an alternatively proposed minimum elevation. As background, there is currently only one ASR project in the State of Kansas operating and as far as the District understands, no other ASR project is currently being proposed or conceived in Kansas. The only current ASR project is the City of Wichita (City) ASR project, which currently consists of two completed phases (Phase I and Phase II). Although the ASR Rules and Regulations K.A.R. 5-1-1 and 5-12-1 that are being proposed to be modified are state-wide rules and regulations, in all practicality the rules and regulations only relate to the current City of Wichita ASR project. Moreover, and as further evidence to this, the City was the entity that requested the changes to the ASR Rules and Regulations and the Economic Impact Statement, as written by the Kansas Department of Agriculture / Division of Water Resources and published in the notice for this public hearing, is almost entirely devoted to the City's ASR project. Therefore, it is impossible to make comments or have a discussion about the proposed rules and regulations modifications without recognizing that the City of Wichita ASR project is the only project that will be affected by the change, both currently and in the foreseeable future.

As further background, the current state-wide ASR Rules and Regulations were developed due to the lack of ASR Rules and Regulations when the City of Wichita ASR project was being conceived in the mid to late 1990s. The current state-wide ASR Rules and Regulations were cooperatively developed between the District, Division of Water Resources (DWR), and the City of Wichita after extensive research, monitoring, and testing, including an ASR demonstration project in the mid to late 1990s. It should be noted and recognized by all that countless hours went in to determining the current minimum Index water level elevations for the current project, with all parties agreeing that the 1993 water level in each ASR Index Cell was the "bottom" of the ASR basin storage area in which the City could recover their established recharge credits. The 1993 water level elevations were recently reviewed and modified after many hours of research, cooperation, and agreement between the City, DWR, and the District.

The proposed changes to the ASR Rules and Regulations K.A.R. 5-1-1 and 5-12-1 were requested by the City with no notice to, or discussion with, the District. This is contrary to the cooperative effort between the City and the District that occurred during the conception and permitting process of the City's current ASR project. The City has also announced that, if the proposed ASR Rules and Regulations modifications are approved, it is their intention to request that the existing ASR water permits' conditions are modified to remove the 1993 water level benchmark that recharge credits can be pumped. Again, although the District recognizes that K.A.R. 5-1-1 and 5-12-1 are state-wide rules and regulations, it is obvious that the rules and regulations only pertain to the City's ASR project and attempting to modify the

existing state-wide ASR Rules and Regulations is the first step by the City to modify the existing ASR water permits by modifying conditions that all parties agreed to when the ASR project and water permits were reviewed and approved.

Based on the current ASR Rules and Regulations K.A.R. 5-1-1 and 5-12-1, minimum water level elevations were established in the 38 Index Cells of the City's ASR project. These minimum Index Cell water levels are important to protect the quantity and quality in the Equus Beds Aquifer in and near the City's well field. One of the main goals of the ASR project is to impede the movement of saltwater contamination in the aquifer near Burrton, Kansas into the Wichita well field area. Maintaining the water levels above the 1993 levels is important so as to not accelerate the movement of the saltwater contamination. Additionally, the protection of existing senior water rights, both domestic and non-domestic, from negative impacts from the City's ASR project was also important during the permitting process. The District, DWR, and the City all agreed that pumping recharge credits below the 1993 water levels was not in the best interest of the aquifer, senior water rights, and the public. This message was conveyed to the public by the City and the District in numerous public meetings as a reassurance to those that use and rely on groundwater in the ASR basin storage area that the City's ASR project would not detrimentally impact them. For several of the City's ASR water permits, the District's Board of Directors granted exceptions to the minimum well spacing requirements of the District's Well Spacing Regulation K.A.R. 5-22-2, to both domestic and non-domestic wells. Additionally, the ASR Phase II Memorandum of Understanding (MOU) (Attached) between the District and the City specifically addresses protecting domestic wells within 660 feet of an ASR well in Issue No. 6. The City's Commitment states that recharge and recovery wells can only be pumped when water levels are above the historic low level (1993 water levels). This commitment by the City compels the District to grant exceptions to the minimum domestic well spacing requirements. Changing the current ASR Rules and Regulations as a first step in removing the 1993 water level restriction is clearly not consistent with the ASR Phase II MOU, and is not consistent with the findings and conditions that were the basis of the minimum well spacing requirements exceptions granted by the District.

Finally, the District is concerned about the manner in which proposed modifications to the ASR Rules and Regulations have been proposed and processed. The District is concerned that one water user can request a modification to a state-wide rule and regulation and the Division of Water Resources would then proceed to process that request, especially in this case in which the rules and regulations are only germane to one water user, one ASR project, and only one groundwater management District. The 1972 Groundwater Management District Act (K.S.A. 82a-1020) clearly gives local groundwater management authority to the groundwater management districts. Establishing and operating an ASR project in a groundwater management district is obviously a local groundwater management issue and therefore the District should be the lead in requesting any changes to rules and regulations that would be a precursor to changing existing ASR water permit conditions. The District is further concerned with the Economic Impact Statement that states the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1 "...will allow the City to operate the aquifer storage and recovery project as intended." This is a false and misleading statement, as the ASR project was **NOT** intended to operate this way as evident by the existing water permit conditions that require the water level to be above the 1993 water level for the City to recover recharge credits. Why else would the existing conditions exist? The District, DWR, and the City all worked cooperatively together to establish the regulations, conditions, and monitoring that was necessary to implement the City's ASR project and protect the aquifer and existing groundwater users. This was a long process that developed a well thought-out project and agreed upon conditions. To propose changes to the existing ASR Rules and Regulations without this cooperative process is improper. The District is open to discussing with the City their concerns regarding being able to recover recharge credits during extended drought periods and working together to find possible remedies. The District therefore recommends that K.A.R. 5-1-1 and 5-12-1 are not modified and that the District, DWR, and the City work together to address the issue.

Memorandum of Understanding
Between
Equus Beds Groundwater Management District No. 2
And
The City of Wichita, Kansas
Regarding
Wichita's Proposed Aquifer Storage and Recovery Project, Phase II

Background

As part of its Integrated Local Water Supply ("ILWS") Plan ("the Plan"), the City of Wichita ("City") planned and constructed the Aquifer Storage and Recovery Project ("ASR") Phase I and completed the same in September of 2006. The City and the Equus Beds Groundwater Management District #2 Board of Directors ("GMD2") entered into a Memorandum of Understanding in 2004 to address issues of mutual concern on that project.

The City now plans to design and construct Phase II of the ASR ("the Project"). Phase II calls for the construction of a surface water intake on the Little Arkansas River, a water treatment plant and pump station, a series of water recharge and recovery wells, a matrix of water pipelines, a matrix of overhead electric power lines and a supervisory control and data acquisition (SCADA) system. The contemplated system will be capable of withdrawing water from the Little Arkansas River, treating, transmitting, storing and recovering up to 30 million gallons per day in compliance with permits issued by the Kansas Department of Agriculture, Division of Water Resources ("DWR") and the Kansas Department of Health and Environment ("KDHE").

The Plan called for the development of both direct surface water diversions and bank storage diversions from induced infiltration. The initial conceptual Plan was for development of 75 Mgd of bank storage diversion facilities and 25 Mgd of surface water diversion facilities. With recent advances in water treatment technology development of additional surface water supplies appears to be feasible.

Application of current well spacing regulations under K.A.R. § 5-22-2 to applications for new permits or for changes in existing water rights create problems in obtaining GMD2 and DWR approval. The City and GMD2 believe that the well spacing regulations should be waived due to the unique nature of the recharge and recovery wells and the benefits to be derived from the operation of the Project.

The City and GMD2 believe the Project has mutual benefits to the City as a source of water supply for the City and its customers and to the residents and landowners in the vicinity of the Project as a means of insuring and protecting the quality and quantity of water for the future.

RECEIVED

DEC 19 2008

The purpose of this Memorandum of Understanding (“MOU”) is to document agreements made by and between the City and GMD2 relating to the permitting, construction and operation of the Project associated with GMD2’s recommendation for approval of the City’s water appropriation applications.

Items of Understanding:

A. GMD2 and the City agree that the following eight issues will be resolved in the following manner:

1. **Issue:** How will the City change the original Plan ratio of 75 Mgd of bank storage diversion and 25 Mgd of surface water diversion?

Commitment: Based on current technology, the City will develop at least 67 Mgd of surface water diversion facilities for recharge based on an ultimate 100 Mgd ASR system.

2. **Issue:** How can the City help GMD2 to cover extraordinary expenses incurred to monitor and review the Project?

Commitment: As reimbursement for expenses incurred and services rendered by GMD2 and necessitated by the Project, the City will provide a grant to GMD2 of \$20,000/year for a period not to exceed five (5) years. This grant is in addition to and not a substitute for GMD2 land and groundwater assessments owed by the City. At the end of five years, the City will consider an extension of the grant as provided in Section B. 5. of this MOU.

3. **Issue:** If GMD2 requests monitoring wells to be located on property where the City has no right of entry or requests the City to perform water quality monitoring of domestic wells near the diversion or recharge facilities, how can GMD2 help the City to accomplish these tasks?

Commitment: GMD2 will assist the City by seeking to obtain permission for right of entry to sites for Project monitoring wells. GMD2 will also assist the City by seeking right of entry and/or samples from domestic wells located near the Project.

4. **Issue:** How can the City maintain water quality in the Project area?

Commitment: The City will insure that the quality of the recharge water injected into the aquifer through the proposed Project wells will meet Kansas Department of Health and Environment recharge well standards as stated in the letter dated February 9, 2007, attached hereto and made a part hereof by reference. Additionally, the City will insure that the water recharged by the Project will not degrade the ambient use of water in the basin storage area. Each new Project well will have two (2) nearby peizometers for continuously measuring water levels. In addition to the six additional proposed monitoring wells, the recharge and recovery well at each site will be sampled annually for the key water quality constituents. The City and GMD2 will jointly conduct an annual public Project review meeting to include stakeholders, regulatory agencies and other interested parties. Within sixty (60) days following the review meeting GMD2 will provide to the City and regulatory agencies a review report on the Project which may include recommendations.

5. **Issue:** How can the City protect domestic water wells from changes in water quality standards?

Commitment: If water quality in existing or future domestic wells meets the then current drinking water standards and the water quality is subsequently changed by the Project such that the water no longer meets the then current drinking water standards, the City will provide and install a home water treatment system to bring the water back to drinking water standards or provide other appropriate remedies to replace the domestic water supply with water that meets the drinking water standard without additional cost to the resident.

6. **Issue:** How will the City protect domestic water wells within 660 feet of a Project recharge and recovery well from adverse drawdown impacts that may result from operation of the well?

Commitment: Because the Project recharge and recovery wells can only be pumped if water levels in the aquifer are higher than the historic low level, no impairment is expected. Nonetheless, if a domestic water well, existing before the approval of this MOU and within 660 feet of an existing or new Project well, is adversely impacted by drawdown from such well, the City will re-drill or take other appropriate, affirmative action to restore productivity of such domestic well to the same rate and quality as existed before.

7. **Issue:** How will the City operate the Project to manage the amount of groundwater pushed back into the groundwater formation when the Project is operating?

Commitment: The City will operate the Project in such a manner as to isolate production wells from recharge activities. The City will not pump water from its groundwater wells in one area to its groundwater wells in another area for the purpose of creating recharge credits. Daily water meter readings for all the Project facilities will be used to facilitate monitoring of recharge activities. The City will make a reasonable effort to shut down wells with above drinking water standard levels of arsenic in advance of a recharge activity to minimize arsenic levels in the Project pipeline system.

8. **Issue:** How will the City operate the Project to minimize adverse impacts arising from the increased level of groundwater associated with artificial recharge of the aquifer?

Commitment: It is the City's intent not to damage any property as a result of the operation of the Project. The City will process claims for damage resulting from the operation of the Project in accordance with KSA 12-105 b., as the City has historically for its other activities in the City's wellfield area.

B. GMD2 and the City further agree as follows:

1. As to any water permit applications filed by the City which in all other respects comply with the regulations of GMD2, and for which the proposed wells are to be used for the purposes of both aquifer recharge as defined by regulation and withdrawal of water for an authorized use, GMD2 agrees to recommend that such proposed applications be granted a waiver of the applicable well spacing requirements. A petition for waiver of the well spacing requirement shall be submitted to GMD2 and shall be granted by GMD2 upon a finding that the conditions set out above do exist and that the granting of the waiver will not unreasonably impair the public interest.
2. The commitments made by the City and GMD2 as set forth in this Memorandum of Understanding are subject to the requirements of State law and regulations and the orders of DWR. In the event that any commitment is in conflict with such law, regulation or order, the law, regulation or order controls. In such event, the City and GMD2 agree to enter into good faith discussions to seek amendment of the commitments consistent with the law, regulation or order.
3. It is the intent of the parties that the provisions of this Memorandum of Understanding are not intended to violate the Kansas Cash Basis Law (K.S.A. 10-1101, et seq.), the Kansas Budget law (K.S.A. 79-2925), or other laws or regulations addressing the budgeting, funding, or expenditures of the respective governmental entities. Therefore, notwithstanding anything to the contrary herein contained, the parties' obligations under this Memorandum of Understanding are to be construed in a manner that assures that each party is at all times in conformance of such laws or regulations.

4. Upon the acceptance of the Memorandum of Understanding by the City and GMD2, GMD2 agrees to attach this Memorandum of Understanding to any recommendation it makes on the Project and forward the same to DWR.
5. At intervals of no more than five (5) years, the City and GMD2 will jointly assess the need to continue any or all the provisions of this MOU.

The parties have each approved this Memorandum of Understanding on the dates designated below, and it is effective as of the latter date of approval.

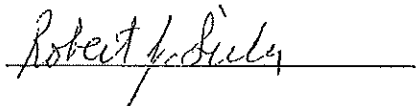
Signed:

Date 12-3-08

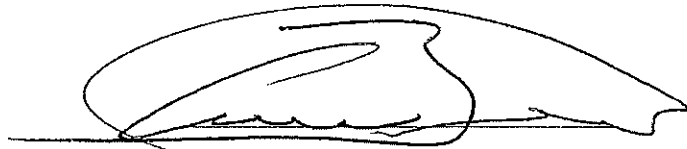
Date _____

Equus Beds Groundwater
Management District No. 2

City of Wichita, Sedgwick County, Kansas

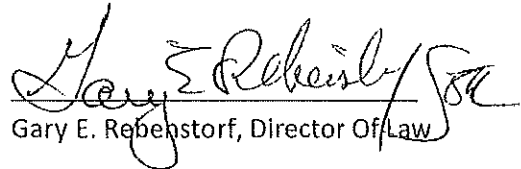


Bob Seiler, President



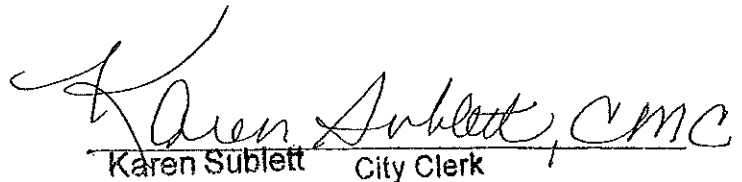
Carl Brewer, Mayor

Approved as to form:


Gary E. Rebenstorf, Director Of Law



ATTEST


Karen Sublett City Clerk

Hutton, Ronda

From: Walker, Jason
Sent: Monday, January 11, 2016 9:36 AM
To: Hutton, Ronda
Subject: RE: update on regulations

Follow Up Flag: Follow up
Flag Status: Flagged

Actually, I will e-mail them..... #1 of 3

Dear Chief Engineer David Barfield
1-9-16

I am writing in opposition to the changes to 5-1-1 and 5-12-1.

1. These changes would change the original intention of the Aquifer Storage and Recovery (ASR). The GMD 2 board, city of Wichita and Division of water resources agreed to the 1993 levels in order to protect the other users of water within the ASR area. If this was a confined aquifer and Wichita was the only water user in the area it would be okay to pump to bedrock. This change could dry up domestic wells as well as other water permits causing impairment. You have to protect all water users in this area and the 1993 levels do this. If there was an ASR happening in Western Kansas you would not want the aquifer pumped to bedrock out there either. When the original permit was issued we worked very hard to implement safeguards to protect the other water users in the area and several people told me then that if the project wasn't working Wichita would just ask that the rules be changed to make it work to their favor. I guess that is what has happened. Unfortunately ASR is not economically feasible either.

2. Creating a void in the aquifer by allowing recharge credits to be pumped to bedrock would cause a definite change in water quality within the region. Wichita has studied this and acknowledged as much. The salt plume would speed up to fill the void as well as the other quality changes in water. I do believe that the aquifer is very elastic and would refill but the change in water quality would give me a lot of pause for concern.

3. Kansas Water Vision regional water goals state that they do not want to deplete the Equus Beds. This is a direct conflict to the Governor's water vision plan. What are we doing?

Please Mr. Barfield do not make these change to 5-1-1 and 5-12-1. Continue the Division policy to protect all water users not just the City of Wichita

Thank you,

Bob Seiler

Jason Walker
Public Relations Director
Kansas Department of Agriculture
785-564-6753
www.agriculture.ks.gov

From: Hutton, Ronda
Sent: Monday, January 11, 2016 9:30 AM

To: Walker, Jason <Jason.Walker@KDA.KS.GOV>

Subject: update on regulations

Jason

Our hearing on the water regulations is at 10 am this morning. Do we have any comments from the website?

Ronda M. Hutton

Legal Assistant

Kansas Department of Agriculture

1320 Research Park Drive

Manhattan, Kansas 66502

Tel.: (785) 564-6715

Fax: (785) 654-6777

Ronda.hutton@kda.ks.gov

www.agriculture.ks.gov

Hutton, Ronda

From: Walker, Jason
Sent: Monday, January 11, 2016 9:37 AM
To: Hutton, Ronda
Subject: RE: update on regulations

Follow Up Flag: Follow up
Flag Status: Flagged

#2 of 3

I am against any changes to the wording of K.A. R. 5-12-1. I am opposed to the idea that the City of Wichita wants to change the rules that will effect and cripple the Ag economy in the area. They will not pump water to bedrock level!

Terry Jacob
Sedgwick Kansas

#3 of 3

I am totally against the idea of changing the rules so that City of Wichita has the ability to pump ground water to BEDROCK! I am against all changes in the current pumping regulation(rules) that are being proposed by the City of Wichita.

Terry Jacob
Sedgwick, Kansas

Jason Walker
Public Relations Director
Kansas Department of Agriculture
785-564-6753
www.agriculture.ks.gov

From: Hutton, Ronda
Sent: Monday, January 11, 2016 9:30 AM
To: Walker, Jason <Jason.Walker@KDA.KS.GOV>
Subject: update on regulations

Jason

Our hearing on the water regulations is at 10 am this morning. Do we have any comments from the website?

Ronda M. Hutton
Legal Assistant
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502
Tel.: (785) 564-6715
Fax: (785) 654-6777
Ronda.hutton@kda.ks.gov

Hutton, Ronda

From: #Sedgwick County Farm Bureau <sedgwickfb@kfb.org>
Sent: Tuesday, January 12, 2016 10:22 AM
To: Hutton, Ronda
Subject: Sedgwick County Farm Bureau Testimony-Hearing on Proposed Rules Change KAR 5-12-1 KAR 5-1-1 (4)
Attachments: Sedgwick County Farm Bureau Testimony-Hearing on Proposed Rules Change KAR 5-12-1 KAR 5-1-1 (4).pdf

Corrected letter from Sedgwick County Farm Bureau Agricultural Association . Removed incorrect title.

Thank you,

Karen Buditt, Admin. Asst.
Sedgwick County Farm Bureau
Agricultural Association
889 N Maize Rd., Ste. 100
Wichita, KS 67212
Phone: 316-773-9851
Mon - Fri. 8-12, 1-4:30
www.sgfb.org

Jackie McClaskey
Secretary of Agriculture
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, KS 66506

Dear Secretary McClaskey,

The members of the Sedgwick County Farm Bureau Board are extremely concerned with the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1, most importantly removing the minimum index water level. This is one of the key tenets of the ASR agreement between the city of Wichita, GMD #2, and DWR. An action this drastic would most certainly impair not only irrigation, but domestic, livestock, and municipal wells within the horizontal boundaries of the ASR areas.

A second result would most likely be a degradation of the quality of water in the ASR by creating a void and vacuum, allowing the Burrton Salt Plume to move south and east at an accelerated rate. Another main tenet of ASR was to prevent and slow this event. Can the Chief Engineer explain how such an important provision and safeguard to the protection of the aquifer be disregarded?

Also of great importance in the event the ASR is drawn to bedrock, does DWR have any studies showing that areas of the aquifer outside the horizontal boundaries of the ASR will be completely unaffected?

Under Kansas state law, water rights are considered personal property. The horizontal boundaries of the ASR are not a closed system. It seems to us that drawing the aquifer to bedrock would undoubtedly adversely affect these water users and rights within the aquifer and also outside the horizontal boundaries of the ASR. With this being a change in state regulation, are we to assume that the Chief Engineer would be comfortable with drawing down other basins in the state to the same level should there be future artificial recharge projects?

Respectfully,

The Sedgwick County Farm Bureau Agricultural Association

Max Tjaden, President

Joseph Youngers, Vice President

Peggy Hill, Secretary/Treasurer

Byron Wells, Board of Director

Rhonda McCurry, Board of Director

Kevin Kohls, Board of Director

Todd Kissinger, Board of Director

Kent Ott, Board of Director

William Carp, Board of Director

Brian Wetta, Board of Director

Written Testimony of Robert Layton, City Manager, City of
Wichita, Kansas
Concerning Proposed Changes to
Administrative Regulation K.A.R. 5-12-1 and associated
definitions in K. A. R. 5-1-1

As the City Manager of Wichita Kansas, I am submitting this written testimony in support of the proposed changes to Kansas Administrative Regulation K.A.R. 5-12-1 and associated definitions in K.A.R. 5-1-1.

The City is actively engaged in the development of a 50-year water supply plan for Wichita and surrounding area customers. The City is a regional water supplier. The City serves a population of 400,000 customers and 77,000 of those people live outside of our city limits.

These changes were requested by the City of Wichita to both enhance the operational value of our Aquifer Storage and Recovery (ASR) Project and improve the management of the Equus Beds Aquifer.

The role of ASR has evolved over the nearly two decades since it was first being considered to today. Wichita has seen reductions in its projected future water demand growth over this timeframe. As a result, the only "new" water supply the City needs for the next 50 years is for times of extraordinary drought. The role of ASR is therefore now to take surface water, treat it and inject it into the Equus Beds Aquifer, so that the water is available for meeting customer needs during a drought.

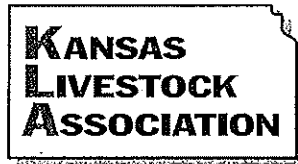
In drought times the level of the aquifer can be expected to drop.

The current regulations motivate us to take recharge water very early in a possible severe drought to be sure that access to these credits is not denied because of the aquifer dropping below 90% of its full level. The existing regulations could actually result in our taking Equus Beds aquifer water to meet customer demand while leaving surface water we could alternatively have used in Cheney Reservoir. This surface water is subject to then being partially lost due to evaporation.

With the flexibility afforded under the proposed regulations, The City can be better stewards of both water supplies and manage them in an integrated fashion that both meets the needs of our customers and enhances the sustainability of the Equus Beds Aquifer.

The proposed new regulations will allow the City of Wichita to use our ASR project to meet the needs of our water customers throughout the Wichita area for the next 50 years. This planning is consistent with the goals and objectives of the 50 year "Vision for the Future of Water Supply in Kansas".

The City of Wichita requests approval of the regulation changes as drafted. Thank you for your consideration of this testimony.



Since 1894

January 13, 2016

Jackie McClaskey
Secretary of Agriculture
1320 Research Park Drive,
Manhattan, Kansas 66502

Re: Comments regarding K.A.R. 5-1-1 & 5-12-1 regarding aquifer storage and recovery systems.

The Kansas Livestock Association (KLA), formed in 1894, is a trade association representing over 5,000 members on legislative and regulatory issues. KLA members are involved in many aspects of the livestock industry, including seed stock, cow-calf and stocker production, cattle feeding, dairy production, grazing land management and diversified farming operations.

Secretary McClaskey,

KLA respectfully submits these comments on the proposed changes to K.A.R. 5-1-1 and 5-12-1 published in the Kansas Register on November 12, 2015, Vol. 34, No. 46, page 1200 by the Kansas Department of Agriculture, Division of Water Resources (DWR).

KLA has concerns about the Burrton area saltwater plume adversely affecting other water rights in the region if Wichita increases use of the aquifer recharge credits. Additionally, the proposed regulatory change deviates from the original agreement between the city of Wichita, DWR, and Groundwater Management District no. 2. Finally, KLA questions how this could potentially affect other portions of the state considering this change seems to be focus on a plan developed by the city of Wichita.

Water quality is obviously important to KLA members in the region. Allowing Wichita to utilize recharge credits by pumping to the bedrock could increase the rate the Burrton area saltwater plume migrates into the area. DWR should thoroughly investigate the saltwater migration and how this regulatory change could affect it. Understanding that this is a change requested by Wichita, the question remains will these changes adversely affect other water rights throughout the state?

KLA urges the DWR to examine the potential adverse effects of these regulatory changes prior to moving forward with the final rule.

Best Regards,

A handwritten signature in black ink, appearing to read "TAS", is written over a horizontal line.

Tucker A. Stewart,
Associate Counsel

Hutton, Ronda

From: Mark Rude <mrude@gmd3.org>
Sent: Thursday, January 14, 2016 12:56 PM
To: Barfield, David; Hutton, Ronda
Cc: Metzger, Susan; Letourneau, Lane; Large, Robert; Beightel, Chris; Meyer, Mike; Lanterman, Jeff; Stewart, Kelly; Tietsort, Katie; sflaherty@gmd2.org; Feril, Orrin; Boese, Tim; Luhman, Ray; gmd1@wbsnet.org; Greg Graff (gkgraff@fairpoint.net)
Subject: GMD3 Witten testimony for the record, K.A.R. 5-1-1 and K.A.R. 5-12-1
Attachments: GMD3KAR_5_1_1 and 5_12_1testimony.pdf; 2016-1 board resolution on GMD3 area state rules affecting management.pdf

Hearing officer David Barfield and Ronda Hutton,

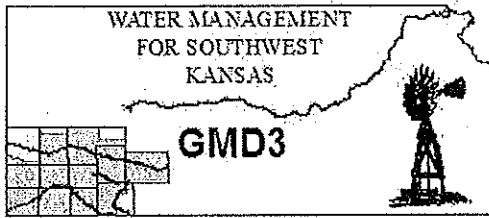
Attached please find our written testimony for the administrative record for consideration in the agency proposal to change the Aquifer Storage and Recovery regulations. This testimony and accompanying resolution should also be considered the process and discussions on *K.A.R. 5-5-1X: Demonstration required to change a point of diversion in areas of decline*. We believe a program revision process first and then the rules needed to implement the program is the only way to respect the rights of water users and the provisions of state law. We also believe this testimony provides the best way forward to institutionally carry out *the Guiding Principles* and *the Keys To Success* in the *Vision for the Future of Water Supply in Kansas* document.

Please let us know any questions or management program requests that you may have.

Mark

Mark E Rude
Executive Director
Southwest Kansas Groundwater Management District No. 3
2009 E Spruce St.
Garden City, Kansas 67846
O 620.275.7147
C 620.272.3001
www.GMD3.org





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

**Written Testimony objecting to omission of process
to develop the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1
Submitted to the Chief Engineer,
Kansas Department of Agriculture, Division of Water Resources
On behalf of the Southwest Kansas Groundwater Management District No. 3
By Mark Rude, Executive Director
January 14, 2015**

On behalf of the Southwest Kansas Groundwater Management District No. 3 elected board of directors and the many local water users and land owners in Southwest Kansas, thank you for this opportunity to testify in objection to the deficiencies in the process followed to propose these revisions to regulations affecting GMD aquifer areas. The lack of provision for the prior revision of local groundwater management programs when considering these proposed regulation revisions is contrary to the Groundwater Management District Act (GMD Act). The process followed by the agency disregards the rights of local water users to lead in establishing and undertaking active local aquifer management programs and the necessary regulations to implement the programs.

The GMD Act of 1972 instituted state policy to preserve basic water use doctrine and to establish the right of local water users to determine their destiny with respect to the use of the groundwater insofar as it does not conflict with the basic laws and policies of the state. The GMD Act sets forth a process for preparing, establishing and modifying a Management Program in each GMD that has not been considered in the state agency process of developing the proposed regulation changes. When a state agency fails to follow a process that includes the initial steps to revise local groundwater management programs under the provisions of the GMD Act, including a local hearing conducted by the board, the result may be an administrative action not consistent with state policy and the rights granted to local groundwater users in 1972.

K.A.R. 5-12-1 has unique local aquifer application that will necessarily have different hydrological and aquifer management considerations locally for each aquifer area across the state. In fact, elements of this regulation are objectionable and have no reasonable application in the declining aquifer areas of GMD3. The regulation is an impediment to the promotion of aquifer storage or replenishment activity in GMD3. There is no provision of law for "statewide" regulations to trump the provisions of the GMD Act and no provision of law requiring groundwater management program regulations to be stricter than overlapping "state wide" regulations to be acceptable. The K.A.R. 5-12-1 regulation is really a GMD No.2 area regulation and should be developed as such under the provisions of the GMD Act for GMD No. 2.

Accordingly, we request that the rights of water users under the GMD Act be upheld and the state process for local groundwater management be followed in developing any administrative standards involving any groundwater management related activity in first seeking a revision of groundwater management programs and then seeking the regulations needed to implement the programs applicable to each GMD. Please do not proceed with these proposed regulations as drafted until proper provision for the GMD Act rights and processes can be accommodated.

Thank you again for this opportunity to provide testimony. We will be happy to discuss this concern with you at your earliest convenience. I have attached a recent supporting resolution of the GMD3 Board for your reference.

Resolution 2016- 1

OF THE

SOUTHWEST KANSAS GROUNDWATER MANAGEMENT DISTRICT

WHEREAS, the Groundwater Management District Act (Act) became Kansas law in 1972 to establish state policy to preserve basic water use doctrine and to establish the right of local water users to determine their destiny with respect to the use of the groundwater insofar as it does not conflict with the basic laws and policies of the state of Kansas, and

WHEREAS, a Certificate of Incorporation of the Southwest Kansas Groundwater Management District No. 3(District) was signed by the Secretary of State on March 23, 1976, and

WHEREAS, the Act sets forth a process of preparing, establishing and modifying a Management Program for the District, and

WHEREAS, a Management Program and Management Program Document has been dully established and adopted, and

WHEREAS, the Act grants that every groundwater management district organized under the act is a body politic and corporate and shall have the power to, among other powers, recommend to the chief engineer and other appropriate state agency heads rules and regulations which relate purposes of the Act, and

WHEREAS, the chief engineer is proposing rules that may directly affect the Management Program of the District and the Rights and procedures established by the Act;

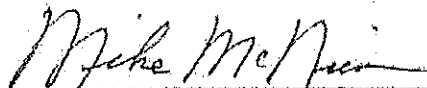
NOW THEREFORE, be it resolved by the Board of Directors of the Southwest Kansas Groundwater Management District No. 3 that any state rules and regulations that would govern the use of groundwater in the District not directly necessary to administer basic water use doctrine should be program modifications, rules and regulations considered through the process of groundwater management established under the Act.

Adopted this 13th day of January, 2016

ATTEST:

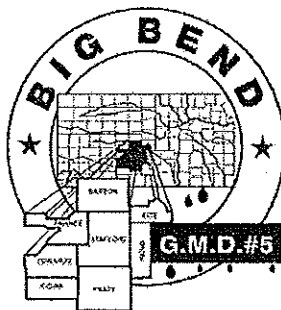


Kent Dunn, President



Mike McNiece, Secretary

Darrell Wood - Edwards (Pres.)
Fred Grunder - Pratt (V Pres.)
John Janssen - Kiowa (Treas.)
Curtis Tobias - Rice (Sec.)
Justin Gatz - Reno
Kent Lamb - Stafford
Phil Martin - Barton
Bob Standish - Pawnee
Tom Taylor - At-Large



Orrin Feril, Manager
125 South Main Street
Stafford, Kansas 67578
ph: (620) 234-5352
fx: (620) 234-5718
gmd5@gmd5.org
www.gmd5.org

Proponent Testimony on K.A.R. 5-25-21

To: Chief Engineer, Kansas Department of Agriculture – Division of Water Resources

By: Orrin Feril, Manager, Big Bend Groundwater Management District #5

January 11, 2016

On behalf of the Board of Directors of the Big Bend Groundwater Management District #5 (District) Chief Engineer Barfield, thank you for the opportunity to provide comments on the proposed K.A.R. 5-25-21. I testify today in support of K.A.R. 5-25-21 as presented.

The water users within the District are conscientious users of the groundwater resource within the District boundaries. Historically, our users use, on average, approximately 75% of their annual authorized appropriation. This proposal is to limit the participant to 90% of the annual appropriation across the 5-year multi-year flex account (MYFA) time period.

In any given year, a producer is able to divert 100% of their authorized appropriation. In drought years, such as 2011, the diversion above average historical use becomes economical. However, in years following such a drought, the producer is able to use their full appropriation once again. This proposed regulation still allows for this to occur but insures the average use does not exceed 90% of the authorized appropriation across the term of the MYFA. Therefore, a comparison of the water use throughout the same period for the same water right should result in a net water savings.

Additionally, this proposed regulation requires participants to remove the endgun from the center pivot system thereby reducing the wetted irrigated acres. Based on preliminary groundwater modeling conducted within the District, the District believes that a reduction in irrigated acres will result in an additional water savings.

This proposed regulation is intended to provide additional flexibility to the producers within the District boundaries. The District supports this regulation and recommends approval of K.A.R. 5-25-21 as presented.

Thank you for this opportunity to participate in this hearing today. I would be happy to answer any questions that you may have.

Written Testimony of Brian Meier

I am pleased to present the following comments pertaining to the proposed changes to K.A.R. 5-1-1 and K.A.R. 5-12-1 as related to Aquifer Storage and Recover (ASR) projects in the State of Kansas.

According to the National Ground Water Association, Managed Aquifer Recharge (MAR) and ASR projects are expected to become an increasingly important tool as municipalities continue to deal with struggling water supplies. Please review the attached article for additional details. The increased need for innovative programs and projects such as ASR highlight the need for a flexible regulatory framework to facilitate the planning, permitting, and implementation of projects in a variety of hydrogeological settings in order to meet a wide variety of project objectives. The proposed modifications to K.A.R. 5-1-1 and K.A.R. 5-12-1 constitute an important step toward providing the necessary flexibility to successfully implement ASR projects in Kansas.

I am currently serving on a MAR workgroup in the state of Oklahoma (OK). The workgroup consists primarily of Oklahoma Department of Environmental Quality (ODEQ) and Oklahoma Water Resources Board (OWRB) staff members. The mission of the workgroup is to develop the regulatory framework for the permitting and implementation of MAR projects throughout the state of OK. As hydrogeological conditions and water supply needs vary significantly across the state of OK the work group quickly recognized the need for a flexible regulatory framework that is adaptable to the permitting of projects with unique conditions, goals or objectives. The proposed modifications to K.A.R. 5-1-1 and K.A.R. 5-12-1 will provide a measure of the same flexibility to the Kansas regulatory framework.

As was noted during the Public Hearing on January 11th in Manhattan, the current regulatory framework for ASR projects in Kansas were developed around the conceptual vision of the proposed Wichita ASR project. The Wichita ASR project was conceptualized for permitting, design, and implementation in a phased approach. The phased implementation was utilized to facilitate program changes resulting from the availability of new technology and/or revision of project goals resulting from changes in supply or demand forecasts. It is inconceivable that a long-term project such the Wichita ASR Program could fully anticipate, during its earliest stages, all of the permit conditions that will materially affect the Programs future. Regulatory flexibility, such as that provided by the proposed modifications to K.A.R. 5-1-1 and K.A.R. 5-12-1 are essential to successful operation and optimization of Wichita's ASR program and future ASR projects in the State of Kansas.

Finally, I note that the proposed modifications to K.A.R. 5-1-1 and K.A.R. 5-12-1 are consistent and compatible with the recently developed Kansas Water Vision, and specifically, the "Water Management" and "Additional Sources of Supply" sections of the Vision. Providing the

regulatory framework and tools necessary to develop and utilize marginal or temporarily available water resources as well as allowing for efficient management of water resources, are critical elements of these Vision sections.

I strongly support the proposed changes and the substantial benefit they will provide.

Brian Meier
14226 W Remington Ct.
Wichita, KS 67235

316-554-6996

bmeier@burnsmcd.com

MANAGED AQUIFER RECHARGE TOOL EXPECTED TO GROW AS DROUGHT CONTINUES

ENVIRONMENTAL ISSUES | WATERTech ENews

JANUARY 11, 2016

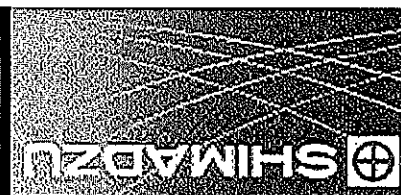
stormwater

California looks to make the most of

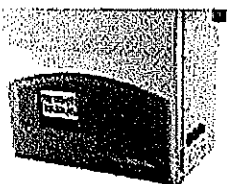


JANUARY 11, 2016

Water dealers: How do you promote the
importance of quality water for health?



Online TOC Analyzer
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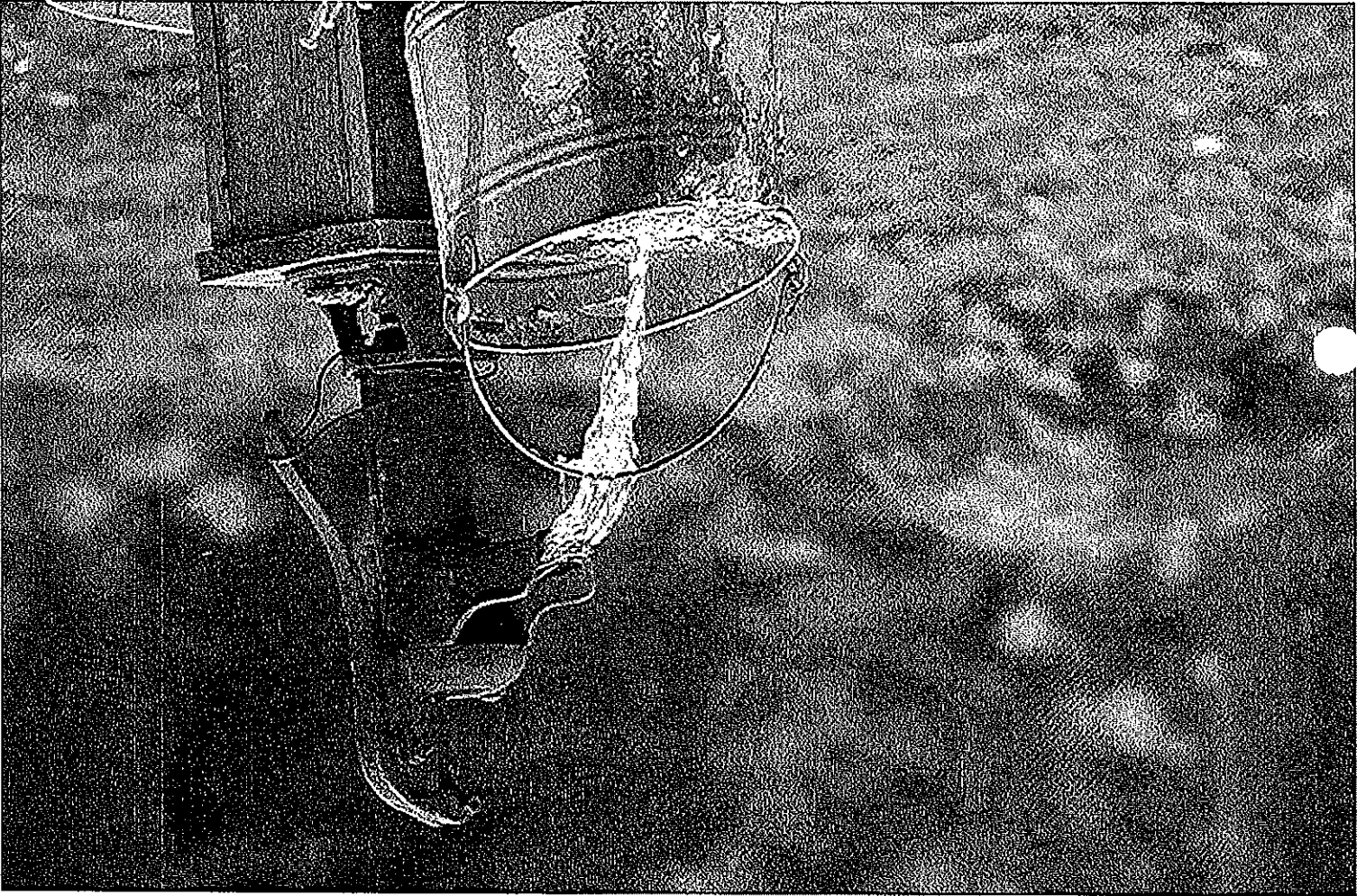


Under controlled conditions, MAR replenishes aquifers by capturing water that is available during low-demand or wet periods.

WATER TECHNOLOGY STAFF DECEMBER 30, 2015

SHARE ON:

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jpbcpa/stock

WESTERVILLE, Ohio — Dec. 29, 2015 — The National Ground Water Association (NGWA) expects managed aquifer recharge (MAR) to become an increasingly important tool as municipalities continue to deal with struggling water supplies in 2016, according to a press release.

Under controlled conditions, MAR replenishes aquifers by capturing water that is available during low-demand or wet periods, "or water that would be lost otherwise," noted the release.

"MAR will become an increasingly important tool for mitigating the economic, environmental and public health impacts of water shortages," said William Alley, Ph.D., NGWA's director of science and technology, in the release. Alley also noted that MAR requires "proper siting selection, design, construction, operation and maintenance, but it can be done."

In addition to contributing to stable water supplies during drought, MAR projects can also mitigate land subsidence, supplement the quantity of groundwater and improve its quality, manage runoff and floodwaters and reduce or halt saltwater intrusion, reported the release.

Hundreds of MAR project have been implemented across the U.S., stated the release. "Successful MAR projects include ones operated by the Orange County (California) Water District; Central Arizona Groundwater Replenishment District; the Peace River Manasota Regional Water Supply Authority (Florida); United Water Resources (Idaho); Rio Rancho, New Mexico; and Dayton, Ohio."

Groundwater supplies about 78 percent of community systems and individual households with independent water sources with water, shared the release. Forty-two percent of the country's agricultural irrigation water also comes from groundwater.

Groundwater is also instrumental in supporting environmental benefits and ecosystems as it feeds streams and rivers, noted the release.

You can find the entire release here.

TAGS:

DROUGHT

PREVIOUS POST

U.K. dairy industry improves energy efficiency and cuts water consumption

NEXT POST

Pressure-retarded osmosis unsuitable as sustainable energy source, study says

RELATED POSTS

Hutton, Ronda

From: Jamie Newman <century55us@hotmail.com>
Sent: Friday, January 15, 2016 1:20 PM
To: Hutton, Ronda
Subject: Open Comments for Wichita Water Proposal

Dear Ms. Hutton,

I am a resident of Harvey County, specifically rural Halstead. I have a well and I am directly affected by the newly-proposed water deal from Wichita.

I would like to let it be known that I vehemently oppose their plan. Not only are they not restricting their residents, like in California or other drought locations, but they are directly putting my home and children in jeopardy. I also have livestock and pets that depend on my well for water.

Would the City of Wichita be willing to buy my useless property when my well salts-in and I can no longer supply my family and animals water? I doubt it.

Please add my name to the record of opposition to the Wichita-Driven Water Proposal for the Equus Beds Aquifer. The agreed to levels from 1993 should remain in-effect. They have other options and should explore those, such as El Dorado's offer.

Sincerely,

Jamie Newman
15000 SW 36th St.
Halstead, KS
(316) 253-5425

Hutton, Ronda

From: Kurt Bookout <kbookout@eldoks.com>
Sent: Friday, January 15, 2016 4:39 PM
To: Hutton, Ronda
Cc: Kurt Bookout
Subject: Public Comment for KAR 5-12-1

As a member of the Kansas Water Office's Equus/Walnut Regional Advisory Committee, I am opposed to the proposed regulation changes that would allow the minimum water level to be defined by the bedrock elevation. The City of Wichita claims without these regulation changes, in the event of a drought, Equus Beds water will "run out" in two years, but with the change they would not run out for four years. Their rationale being they would need to take their ASR credits early, before water levels drop below the 1993 index water level. The real question should be, "How much ASR credits do they have or expect to have, to retrieve". The latest USGS tracking of water recharge shows 2015 was ASR's best year ever, with 557 million gallons recharged, with the second best year being 2007 with 369 million gallons recharged. The 557 MG represents only about 5 days of water at Wichita's current peak demand. Wichita's drought planning shows a 1% drought might last about 8 years. Even if they accumulated 10 years of "recharge credits", they would have less than two months of water stored in the Equus Beds at peak summer demand.

Wichita does have **drought** options other than drawing the Equus Beds down to bedrock and accelerating the migration of chlorides into an aquifer where many other stakeholders would be impacted. The City of El Dorado first began to explore expanding the utilization of excess water in El Dorado Lake with a meeting and subsequent yield study by the Kansas Water Office. This study revealed the lake was vastly underutilized and could support up to 40 mgd in additional water use. We followed this up with a yield study by Black & Veatch, which agreed with the Kansas Water Office study. As the dry period in 2011-13 wore on, we met with Wichita and they asked about our ability to deliver water in record drought. We again went back to Black and Veatch and asked them to conduct a drought modeling of El Dorado Lake to answer this question. We wanted to be very conservative, so we asked Black and Veatch to not just model the drought of record, but back to back droughts of record. After examining precipitation records for both Wichita and El Dorado, during the drought of the 1930's and 1950's, we were surprised with the results. The 1950's drought was much more severe than the drought of the 30's for both cities. In fact, the average precipitation deficit during the 1930's drought in Wichita was -6.246 inches/year, while the average deficit in the 1950's drought was -14.606 inches/year. Black and Veatch used the drought of the 1950's for their drought modeling and then doubled it. The results showed El Dorado Lake could supply our current demand, with no conservation efforts and an additional 10 mgd for Wichita, for **nine** years before running out of water. We shared this study with Wichita, but it appears to us they have chosen to ignore it and have on multiple occasions made statements that El Dorado just can't guarantee water at the end of a drought, which Wichita says is the only time they would need our water.

Within the last few months, we were called to attend a meeting with Wichita's Alan King to talk about water. Upon arrival, they presented us with a study by John Winchester of High Country Hydrology, Boulder, CO. He had run a drought modeling of El Dorado Lake for a 1% drought, one that might occur every 100 years. Wichita had not contacted us to gather any water demand data or other inputs into the model, they instead decided to make some inaccurate assumptions. The model did not utilize real precipitation data, but instead used the Palmer Drought Severity Index that is based off of theoretical soil moisture indices, based on tree ring data, extrapolated with points across North America. Interestingly, there is no Kansas tree ring data for the time periods the study used for drought modeling. The nearest index point to Wichita, appears to be near Pittsburg, Kansas. Eight years was the period of time Wichita said El Dorado Lake must be able to supply Wichita with 10 mgd, so based on PDSI data they chose two droughts with a duration of 8 years, one in 1295

and the other in 1353. Even with the wrong data going into the model, the model concluded El Dorado Lake could supply our own needs and Wichita with 10 mgd for 7.1 years of record drought. We pointed out the errors that overestimated El Dorado's usage by over 8 mgd and asked them to re-run the model with the correct numbers. Weeks, then months went by with no response by Wichita to our inquiries. Then, last week, John Winchester called me back and told me Wichita had decided to run the revised model analysis themselves instead of utilizing his engineering services.

The ASR project came into being to create a positive hydraulic head to retard the salt plume, while a negative head will do the opposite. The action of lowering the allowed drawdown would be in total opposition to the intended purpose of ASR. Once the chlorides are in the entire aquifer, they can only be removed by Reverse Osmosis, and agriculture, as well as other stakeholders would not be able to make use of the water, unless they too, built their own RO facilities.

Wichita's proposal could result in irreparable environmental damage of the Equus Beds. Conversely, El Dorado will continue to work regionally to champion the wise use of our resource to ensure viability of supply during extreme times.

Kurt Bookout

Director of Public Utilities
City of El Dorado
105 Wetlands Drive
316-322-4980 office
316-323-2904 cell

"When the well's dry, we know the worth of water"
- Benjamin Franklin

Hutton, Ronda

From: Jeff and Jill Couchman <notasofaguy@gmail.com>
Sent: Friday, January 15, 2016 9:46 PM
To: Hutton, Ronda
Subject: Wichita Equus Beds proposal

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Water

Regarding a recently proposed amendment to the way the City of Wichita is allowed to draw water from the Equus Beds Aquifer:

I am a resident of rural Harvey county relying solely on well water for my household. While I do not draw directly from the equus bed for my personal water use, I am concerned about allowing the city of Wichita to draw 'all the way down to bedrock' according to a local newspaper article. The change the city of Wichita is proposing needs to be seriously thought through. There are thousands of people in rural Harvey, eastern Reno and northern Sedgwick counties that may be affected by any change in the ruling.

As I understand the issue, Wichita would be allowed to draw down a significantly larger volume of water than what is currently allowed. If I am not mistaken, the equus bed is being depleted at unsustainable rates with the current use policy. If they are allowed more volume to be drawn off, would that not make the depletion rate even more critical?

is not the use by local residents, whether farmers or municipalities, just as important as the residents of Wichita?

I don't know the procedure, who makes the decision etc. but it must be understood that it is not appropriate to benefit the city of Wichita at the expense of those of us living in the rural parts of the county.

I am adamantly opposed to making this change in policy.

Thank you.
Jeff Couchman
4019 SW 24th Street
Newton, KS 67114

Hutton, Ronda

From: Jodie Thach <thachwestfall@gmail.com>
Sent: Saturday, January 16, 2016 2:59 PM
To: Hutton, Ronda
Subject: Response to Wichita-Driven Water Proposal Could Dry Up Harvey County

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Water

The article in the Harvey County Independent on 1/14/16 was alarming if it is true. We get our Independent in the mail on Thursday, and the response time was until Friday. Seems a bit short. I am hoping that Harvey County is getting all of the facts and the residents are being represented fairly. Would appreciate additional information and updates as it becomes available. I am a lake, well, and property owner in Harvey County.

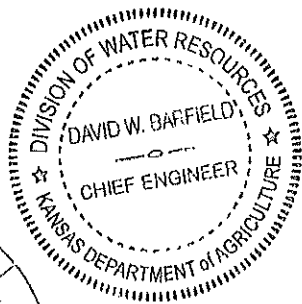
Jodie Thach
19650B SW 24th St
Burrton, KS 67020
thachwestfall@gmail.com

CERTIFICATE OF ADOPTION

I, David W. Barfield, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture, hereby certify the following:

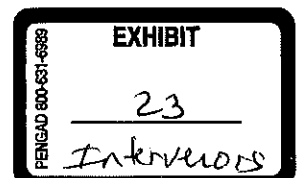
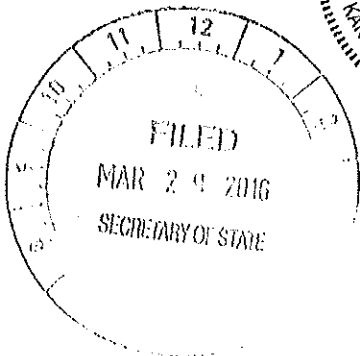
1. That I am authorized to adopt, amend, and revoke regulations pursuant to the Kansas Water Appropriation Act, K.S.A. 82a-701 *et seq.*
2. That I hereby file the following documents, with this certificate:
 - a. The original and one copy of the approved and stamped copies of the following regulation:
K.A.R. 5-1-1
K.A.R. 5-12-1
 - b. Economic impact statement.
3. That with due notice a public hearing was held on January 11, 2016 at 10:00 a.m. with 28 people in attendance at the Kansas Department of Agriculture to consider this proposal.
4. That these regulations are hereby adopted as permanent regulations.

IN TESTIMONY WHEREOF, I have set my hand this 24th day of March, 2016.



A handwritten signature in black ink that reads "David W. Barfield".

David W. Barfield, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture



**KANSAS DEPARTMENT OF AGRICULTURE
IMPACT STATEMENT
Amended Regulations**

K.A.R. 5-1-1 Definitions; and K.A.R. 5-12-1 Aquifer Storage and Recovery Permitting

I. Summary of Proposed Regulation, Including Its Purpose.

K.A.R. 5-12-1 relates to the storage of water in an aquifer storage and recovery system for the purposes of artificial recharge. As described in K.A.R. 5-12-1 each applicant for a permit to appropriate water for artificial recharge shall define the horizontal and vertical extent of the basin storage area. The proposed changes to K.A.R. 5-12-1 would allow the minimum water level to be defined by the bedrock elevation as opposed to the current definition of the water level that occurred within 10 years prior to the application filing or longer period if demonstrated by the applicant to reflect the lowest water level.

K.A.R. 5-1-1 is amended to add definitions as used in K.A.R. 5-12-1.

II. Reason Or Reasons The Proposed Regulation Is Required, Including Whether Or Not The Regulation Is Mandated By Federal Law.

The regulation change was requested by the City of Wichita. The City has developed and is in the process of implementing an aquifer storage and recovery project in the Equus Beds Aquifer. A primary purpose of the initial phase of the storage recovery project was to develop a freshwater barrier to the salt water contamination moving towards the wellfield from the Burrton Area. Under existing regulations, the bottom extent of the basin storage area is defined by the calculated levels of storage in 1993. The principle purpose of subsequent ASR phases has been to provide for additional long-term supply for the City.

Prior to 1993 and in the years since, the City of Wichita has increased the use of surface water from Cheney Reservoir and decreased the use of Equus Beds groundwater resources. As a result, water levels within the Wichita well field have partially recovered.

Examination of the USGS storage data indicates that during the recent drought, a pattern of decline is emerging in areas of the Equus Beds Aquifer. While the City has not increased its usage from the aquifer and does not use all of its available water appropriations, water levels have declined significantly during the recent drought through reduced recharge and increased use within the basin storage area. This pattern indicates water levels in the basin storage area for the aquifer storage and recovery project are not solely dependent on the amount of water that the City utilizes. The City is concerned that during future, critical dry periods, water levels may fall below 1993 levels and the City would be prevented from recovering ASR credits.

The City has requested the revision to allow for withdrawal of recharge credits when they are available and remove the restrictions limiting recharge credit withdrawal when levels are above the 1993 index water level. This change will allow the City to operate the aquifer storage and recovery project as intended.

The regulation, while requested by the City of Wichita, will be applied statewide.

The regulation is not mandated by Federal Law.

III. Anticipated Economic Impact Upon The Kansas Department Of Agriculture.

There will be minimal costs associated with revising permit conditions.

IV. Anticipated Financial Impact Upon Other Governmental Agencies And Upon Private Business Or Individuals.

There will be no costs to other governmental agencies or private businesses or individuals.

V. Less Costly or Intrusive Methods That Were Considered, But Rejected, And The Reason For Rejection.

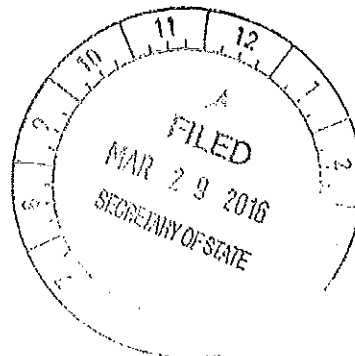
No alternative methods were considered because of minimal impact to the agency and other governmental agencies.

VI. Environmental Impact

No significant impacts (neither beneficial nor degrading) could be identified as resulting should the proposed changes be adopted. The storage capacity of the basin storage will not change under the request, only the ability to recover recharge credits when they are available as determined by the aquifer storage project accounting and Kansas Department of Agriculture accounting.

VII. Public Hearing

A public hearing was held on January 11, 2016, at 10:00 a.m. with 28 people in attendance at the Kansas Department of Agriculture to consider this proposal.



K.A.R. 5-1-1. Definitions. As used in these regulations and the Kansas water appropriation act, and by the division of water resources in the administration of the Kansas water appropriation act, unless the context clearly requires otherwise, each of the following words and phrases terms shall have the meanings meaning specified in this regulation: :

(a) "Above-baseflow stage" means streamflow that is in response to a significant runoff event during which period the water level elevation of the stream is greater than the elevation of the adjacent water table.

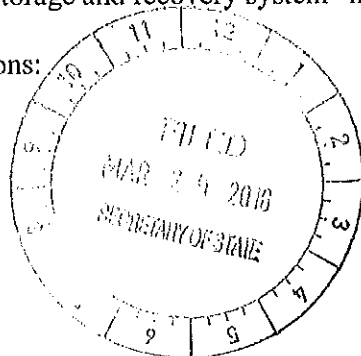
(b) "Acceptable quality surface water" means surface water that will not degrade the quality of the groundwater source into which ~~it~~ the surface water is discharged.

(c) "Application" means the formal document submitted on the form prescribed by the chief engineer for a permit to appropriate water for beneficial use and filed in the office of the chief engineer as provided by pursuant to K.S.A. 82a-708a and 82a-709, and amendments thereto.

(d) "Approval of application" means a permit to proceed with construction of diversion works and the diversion and use of water in accordance with the terms and conditions ~~set forth~~ specified in the permit. Approval of application shall not constitute any permit that may be required by other state laws.

(e) "Aquifer storage" means the act of storing water in the ~~unsaturated portion of~~ an aquifer by artificial recharge for subsequent diversion and beneficial use.

(f) "Aquifer storage and recovery system" means the physical infrastructure that meets the following conditions:



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(1) Is constructed and operated for artificial recharge, storage, and recovery of source water; and

(2) consists of apparatus for diversion, treatment, recharge, storage, extraction, and distribution.

(g) "Artificial recharge" means the use of source water to artificially replenish the water supply in an aquifer.

(h) "Authorized representative" means any staff employee designated by the chief engineer to perform duties and functions on behalf of the chief engineer.

(i) "Bank storage" means water absorbed by and temporarily stored in the banks and bed of a stream during above-baseflow stage.

(j) "Bank storage well" means a well used to divert or withdraw water from bank storage.

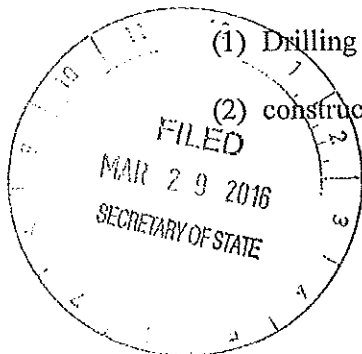
(k) "Basin storage area" means the portion of the ~~aquifer's unsaturated zone~~ aquifer used for aquifer storage that has defined horizontal boundaries and is delimited by ~~the highest and lowest~~ a maximum index water level elevations and a minimum index level.

(l) "Basin storage loss" means that portion of artificial recharge naturally flowing or discharging from the basin storage area.

(m) "Basin term permit" means a term permit to appropriate surface water from a stream within a specific drainage basin, or a portion of it, for a reasonable quantity of water, not to exceed a maximum of 100 acre-feet per calendar year, for use in either of the following:

(1) Drilling oil and gas wells; or

(2) construction projects within the specified basin.



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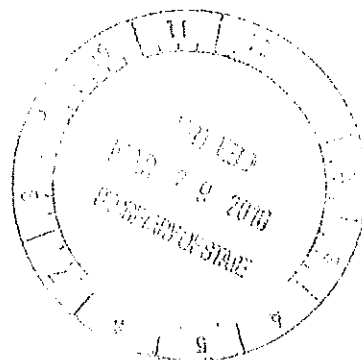
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(n) "Battery of wells" means two or more wells connected to a common pump by a manifold, or not more than four wells in the same local source of supply within a 300-foot-radius circle that are being operated by pumps not to exceed a total maximum rate of diversion of 800 gallons per minute and that supply water to a common distribution system.

(o) "Beneficial uses of water" are the following:


- (1) Domestic uses;
- (2) stockwatering;
- (3) municipal uses;
- (4) irrigation;
- (5) industrial uses;
- (6) recreational uses;
- (7) waterpower;
- (8) artificial recharge;
- (9) hydraulic dredging;
- (10) contamination remediation;
- (11) dewatering;
- (12) fire protection;
- (13) thermal exchange; and
- (14) sediment control in a reservoir.



(p) "Complete and accurate water use report" means a water use report that the water right owner has filed pursuant to K.S.A. 82a-732, and amendments thereto, that provided all of the information required on the form prescribed by the chief engineer, including the following:

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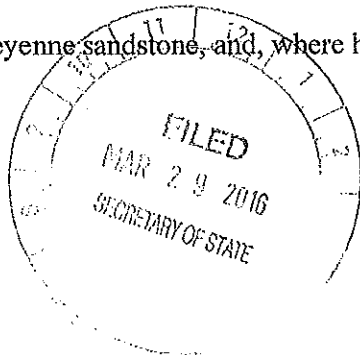
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- (1) The quantity of water diverted during the calendar year;
- (2) if the diversion of water was required to be metered during the calendar year for which the report is being filed, the information required by K.A.R. 5-3-5e;
- (3) if the water was used for irrigation purposes, the number of acres that were irrigated;
- and
- (4) if the water was diverted from a sand and gravel pit operation, the size of the surface area of the pit in acres at the end of the calendar year for which the report was filed.
- (q) "Completed substantially as shown on aerial photograph, topographic map, or plat," as used to define the authorized point of diversion, means within 300 feet of the location as shown on the aerial photograph, topographic map, or plat accompanying the application.
- (r) "Confined Dakota aquifer system" means that portion of the Dakota aquifer system overlain by a confining layer resulting in the aquifer normally being under greater than atmospheric pressure.
- (s) "Conjunctive use" means the safe-yield management and operation of an aquifer in coordination with a surface water system to enhance the use of the total water supply availability in accordance with the provisions of the water appropriation act.
- (t) "Contamination remediation" means the diversion of water by a state agency, or under a written agreement or order of an appropriate state agency, for the purpose of improving the water quality.
- (u) "Dakota aquifer system" shall include the Dakota formation, the Kiowa formation, the Cheyenne sandstone, and, where hydraulically connected, the Morrison formation.



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(v) "Dakota aquifer system well" means a well or proposed well screened in whole or in part in the Dakota aquifer system.

(w) "Dam" means any artificial barrier, together with all appurtenant works, that does or could impound water.

(x) "Dewatering" means the removal of surface water or groundwater to achieve either of the following:

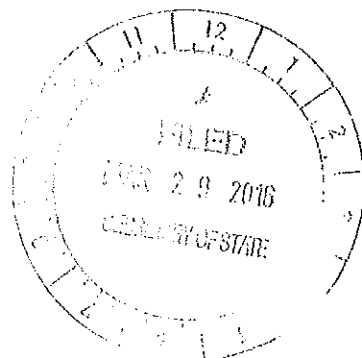
- (1) Facilitate the construction of a building, pipeline, or other facility; or
- (2) protect a building, levee, mining activity, or other facility.

(y) "Direct diversion of surface water" means the diversion of surface water directly from a stream by means of a pump, headgate, siphon, or similar installation, for application to beneficial use without storing it behind a dam, levee, or similar type of structure.

(z) "Diversion" means the act of bringing water under control by means of a well, pump, dam, or other device for delivery and distribution for the proposed use.

(aa) "Diversion works" means any well, pump, power unit, power source, dam, and any other devices necessary to bring water under control for delivery to a distribution system by which the water will be distributed to the proposed use and any other equipment required as a condition of the permit, including a check valve, water level measurement tube, meter, or other measuring device.

(bb) "Division" means the division of water resources of the Kansas department of agriculture.



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(cc) "Dry hydrant" means a permanent, unpressurized intake pipe used to remove water from a pond, stream, reservoir, or other surface water supply by means of suction or vacuum supplied by a fire truck or other portable pumping device.

(dd) "Field inspection" means that for the purpose of issuing a certificate of appropriation pursuant to K.S.A. 82a-714 and amendments thereto, the chief engineer conducts a test of the rate of diversion of the diversion works under the normal and maximum conditions that the diversion works actually applied water to beneficial use during the perfection period. The chief engineer also collects all other information necessary to prepare a certificate, including the following:

(1) A description of the location and size of the place where water was actually applied to beneficial use during the perfection period in accordance with the terms, conditions, and limitations of the approval of application;

(2) information on the quantity and rate of water that was applied to the authorized use during the perfection period; and

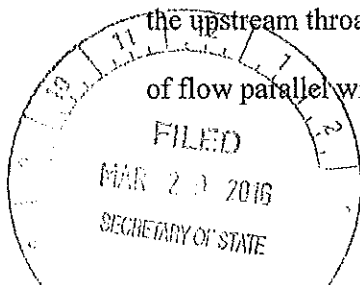
(3) the actual location of the point or points of diversion from which water was diverted in accordance with the terms, conditions, and limitations of the approval of application.

(ee) "Fire protection" means the use of water for fire protection by a fire department for public protection in general.

(ff) "Fish farming" means the controlled cultivation and harvest of aquatic animals.

(gg) "Flow-straightening vanes" means vanes, or any other deviee devices installed at

the upstream throat of a measuring chamber for the purpose of aligning all velocity components of flow parallel with the flow in the measuring chamber at the water flowmeter sensor location.



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(hh) "Full irrigation" means the application of water to crops during the growing season. Full irrigation shall include water for preirrigation.

(ii) "Groundwater" means water below the surface of the earth.

(jj) "Growing season" means the average frost-free period of the year.

(kk) "Household purposes" means the use of water by a person for cooking, cleaning, washing, bathing, human consumption, rest room facilities, fire protection, and other uses normally associated with the operation of a household.

(1) "Fire protection" shall be considered to be use of water for "household purposes" if either of the following conditions is met:

(A) Water is available from a "dry hydrant" that has been installed on a pond located within 1,000 feet of the residence.

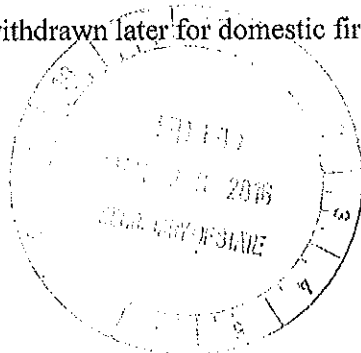
(B) Water can be pumped from a well located within 1,000 feet of the residence for fire protection.

(2) Household purposes shall also include the replacement of the potential net evaporation from a domestic pond of up to 1/2 acre in surface area if both of the following conditions are met:

(A) The pond is utilized for aesthetic purposes as an integral part of the landscaping of a house.

(B) Any portion of the pond is located within 300 feet of the closest edge of the house.

(3) The maximum reasonable annual quantity of groundwater that may be pumped into a pond to be withdrawn later for domestic fire protection shall not exceed 0.06 acre-feet plus the



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average annual potential net evaporation for a pond at that location in the state having a surface area of 0.2 of an acre.

(4) Household purposes shall also include the use of 1 1/2 acre-feet of water or less per calendar year by an industrial user, restaurant, hotel, motel, church, camp, correctional facility, educational institution, or similar entity for household purposes.

(ll) "Hydraulic dredging" means the removal of saturated aggregate from a stream channel, pit, or quarry by means of hydraulic suction and the pumping of the aggregate and water mixture as a slurry to a location where at least 95% percent of the water returns directly to the source of supply.

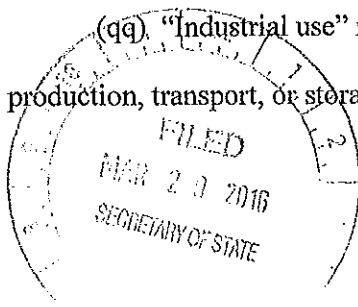
(mm) "Immediate vicinity," as used in specifying the place of use for a water right in which the water is authorized to be used for municipal purposes, means within 2,640 feet of the corporate limits of the municipality, rural water district, or other entity.

(nn) "In compliance" means that a water flowmeter does not meet any of the criteria of K.A.R. 5-1-9 for being out of compliance.

(oo) "Index water level" means ~~water level~~ elevations established spatially throughout a basin storage area to be used to represent the maximum volume of a basin storage area, and storage available for recovery based upon accounting methodology, and conditions of the permit.

(pp) "Indirect use" means the total of the seepage loss and the average annual potential net evaporation loss from the surface of water originally impounded in a reservoir for beneficial use.

(qq) "Industrial use" means the use of water in connection with the manufacture, production, transport, or storage of products, or the use of water in connection with providing



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commercial services, including water used in connection with steam electric power plants, greenhouses, fish farms, poultry operations that are not incidental to the operation of a traditional farmstead pursuant to K.S.A. 82a-701(c) and amendments thereto, secondary and tertiary oil recovery, air conditioning, heat pumps, equipment cooling, and all uses of water associated with the removal of aggregate for commercial purposes except the following:

(1) The evaporation caused by exposing the groundwater table or increasing the surface area of a stream, lake, pit, or quarry by excavation or dredging, unless the evaporation has a substantially adverse impact on the area groundwater supply; and

(2) hydraulic dredging.

(rr) "Irrigation use" means the use of water for the following:

(1) The growing of crops;

(2) the watering of gardens, orchards, and lawns exceeding two acres in area; and

(3) the watering of golf courses, parks, cemeteries, athletic fields, racetrack grounds, and similar facilities.

(ss) "Maximum index level" means the maximum elevation for storage within a basin storage area or, if the basin storage area is subdivided, a smaller subdivided area.

(tt) "Measuring chamber" means a cylindrical chamber in which a water flowmeter is installed that is calibrated to match the measuring element of the water flowmeter and the nominal size of the pipe in which it is installed.

(uu) "Minimum index level" means 20 feet above the bedrock elevation or an alternatively proposed minimum elevation for storage within a basin storage area or, if the basin storage area is subdivided, a smaller subdivided area.

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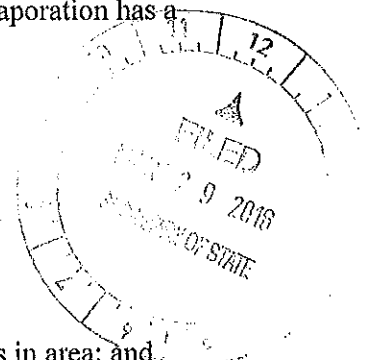
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~~(tt)~~ (vv) "Municipal use" means the various uses made of water delivered through a common distribution system operated by any of the following:

- (1) A municipality;
- (2) a rural water district;
- (3) a water district;
- (4) a public wholesale water supply district;
- (5) any person or entity serving 10 or more hookups for residences or mobile homes; or
- (6) any other similar entity distributing water to other water users for various purposes.

Municipal use shall also include the use of water by restaurants, hotels, motels, churches, camps, correctional facilities, educational institutions, and similar entities using water that does not qualify as a domestic use.

~~(uu)~~ (ww) "Nonvolatile memory" means the ability of a water flowmeter to retain the values stored in the mechanical or electronic memory if all power, including backup battery power, is removed.

~~(vv)~~ (xx) "Normal operating range" means the range of flow rates for which the water flowmeter will meet the accuracy requirements of K.A.R. 5-1-4 (a), as certified by the water flowmeter manufacturer.

~~(ww)~~ (yy) "Off-season irrigation" means the application of water to land for the purpose of storing moisture in the soil for future use by a crop that will not be irrigated during the growing season.

~~(xx)~~ (zz) "Operator," as used in the regulation of sand and gravel pits, means any person who engages in mining sand or gravel, or both.

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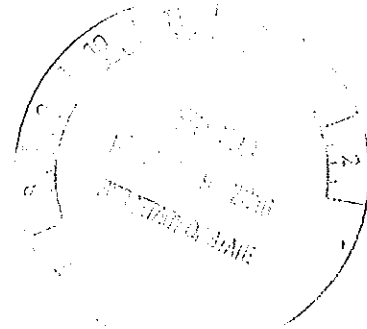
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(yy) (aaa) "Perennial stream" means a stream, or part of a stream, that normally flows during all of the calendar year, except during a drought.

(zz) (bbb) "Perfect" means the actions taken by a water user to develop an approval of application into a water right. These actions shall consist of the completion of the diversion works and the actual application of water to the authorized beneficial use in accordance with the terms, conditions, and limitations of the approval of application.

(aaa) (ccc) "Point of diversion" means the point at which water is diverted or withdrawn from a source of water supply.

(bbb) (ddd) "Point of diversion of a dewatering site" means the geographic center of the area from which water is temporarily removed to lower the static water level or streamflow to allow one construction project or one excavation to take place. Each one-quarter linear mile of construction trench, or part thereof, shall have at least one point of diversion.

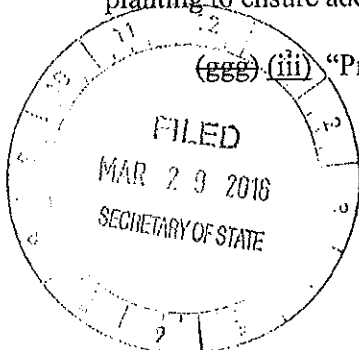
(eee) (eee) "Point of diversion of a remediation site" means the geographic center of the area from which water is being removed to be treated or injected into a single disposal well.

(ddd) (fff) "Point of diversion for storage of surface water in a reservoir created by a dam" means the point at which the longitudinal axis of the dam crosses the centerline of the stream impounded by the reservoir.

(eee) (ggg) "Potential annual runoff" means the mean annual runoff for the watershed of the reservoir.


(fff) (hhh) "Preirrigation" means the application of water to the land for a crop before planting to ensure adequate moisture for early plant growth.

(eee) (iii) "Primary well" means a well for which a standby well is available.



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(hhh) (jjj) "Prior right" means a vested right, an appropriation right with earlier priority, or a permit with earlier priority than that of a subsequent appropriation right or permit.

(iii) (kkk) "Proven reserves" means extractable sand and gravel deposits for which good estimates of the quantity and quality have been made by various means, including core drilling.

(jjj) (lll) "Recharge" means the natural infiltration of surface water or rainfall into an aquifer from its catchment area.

(kkk) (mmm) "Recharge credit" means the quantity of water that is stored in the basin storage area and that is available for subsequent appropriation for beneficial use by the operator of the aquifer storage and recovery system.

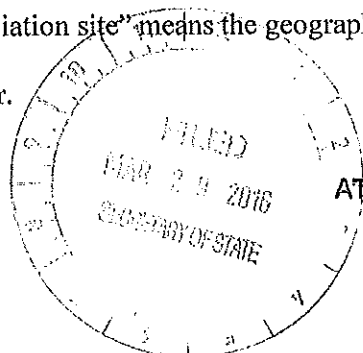
(lll) (nnn) "Recreation storage" means the storage and use of water within the reservoir for recreational use as defined in this regulation. Water stored for ~~recreation~~ recreational use in a reservoir shall be considered to be an indirect use of water.

(mmm) (ooo) "Recreational use" means a use of water in accordance with a water right that provides entertainment, enjoyment, relaxation, and fish and wildlife benefits.

(nnn) (ppp) "Rediversion of water" means releasing or withdrawing water that had been previously impounded behind a dam, levee, or similar type of structure, by use of a pump, outlet tube, headgate, or similar type of device, and the application of the water directly to beneficial use.

(ooo) (qqq) "Register" means an integral or remote device that displays the quantity of water passing the water flowmeter sensor and is part of the water flowmeter.

(ppp) (rrr) "Remediation site" means the geographic area where contamination is being removed from groundwater.



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~~(qqq)~~ (sss) "Reservoir" means the area upstream from a dam that contains, or will contain, impounded water.

~~(rrr)~~ (ttt) "Reservoir capacity" means the volume of water that can be stored below the lower of either of the following:

- (1) The elevation of the principal spillway tube; or
- (2) the lowest uncontrolled spillway in the reservoir.

~~(sss)~~ (uuu) "Reservoir having a total water volume of less than 15 acre-feet," as used in K.S.A. 82a-728 and amendments thereto, means a reservoir having a capacity of 15 acre-feet or less as measured at the principal spillway tube or the lowest uncontrolled spillway, whichever is lower.

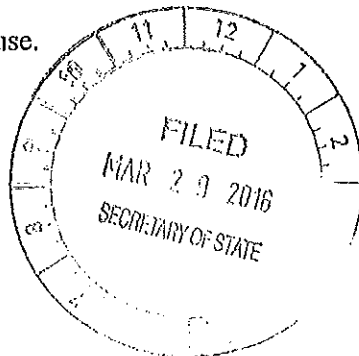
~~(ttt)~~ (vvv) "Safe yield" means the long-term sustainable yield of the source of supply, including hydraulically connected surface water or groundwater.

~~(uuu)~~ (www) "Sand and gravel pit operation" means a project that meets the following conditions:

- (1) Excavates overburden for mining sand or gravel, or both, exposing the underlying groundwater table to evaporation; and
- (2) has a perimeter equal to or greater than its depth.

~~(vvv)~~ (xxx) "Sediment control in a reservoir" means a beneficial use of water that meets both of the following criteria:

- (1) The water is stored in a reservoir that has no other authorized type of beneficial use, except domestic use.



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(2) The water is stored only in the part of the reservoir designed and constructed for the storage of sediment.

(~~www~~) (~~yyy~~) "Source water" means water used for artificial recharge that meets the following conditions:

- (1) Is available for appropriation for beneficial use;
- (2) is above base-flow stage in the stream;
- (3) is not needed to satisfy minimum desirable streamflow requirements; and
- (4) will not degrade the ambient groundwater quality in the basin storage area.

(~~xxx~~) (~~zzz~~) "Specialty crop" means a crop other than a normal Kansas field crop. This term shall include turf grass, trees, vegetables, ornamentals, and other similar crops.

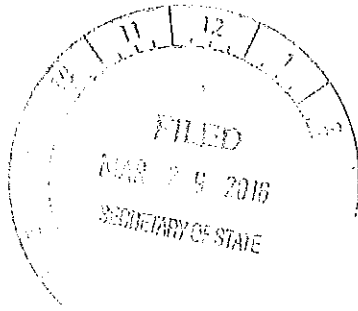
(~~yyy~~) (~~aaa~~) "Standby well" means a well that can withdraw water from the same source of supply as the primary well and that is used only when water is temporarily unavailable from the primary well or wells authorized to be used on the same place of use because of mechanical failure, maintenance, or power failure. A standby well may also be used for fire protection or a similar type of emergency.

(~~zzz~~) (~~bbb~~) "Static water level" means the depth below land surface at which the top of the groundwater is found when not affected by recent pumping.

(~~aaa~~) (~~ccc~~)(1) "Stockwatering" means the watering of livestock and other uses of water directly related to either of the following:


- (A) The operation of a feedlot with the capacity to confine 1,000 or more head of cattle;

or



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(B) any other confined livestock operation or dairy that would divert 15 or more acre-feet of water per calendar year.

(2) Stockwatering shall not include the irrigation of feed grains or other crops.

(3) For the purposes of this subsection, a group of feedlots or other confined feeding operations shall be considered to be one feedlot or confined feeding operation if both of these conditions are met:

(A) There are common feeding or other physical facilities.

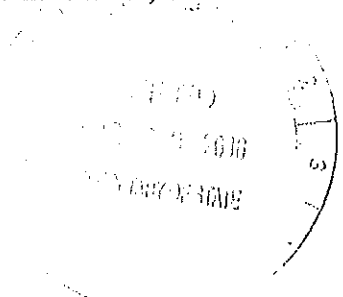
(B) The group of facilities is under common management.

~~(bbb)~~ (ddd) "Straight pipe" means a straight length of pipe free of all internal obstructions, including size changes, valves, cooling coils, injection ports, sand or foreign material, and any other condition that would cause a disturbance of the internal velocity profile in the pipe. Internal obstructions shall not include properly designed, constructed, and installed straightening vanes and inspection ports.

~~(eee)~~ (eee) "Stream channel aquifer" means unconsolidated water-bearing deposits in river valleys, flood plains, and terraces that are separate and distinct from any other aquifer and capable of yielding water in sufficient quantities for beneficial use.


~~(ddd)~~ (fff) "Surface water" means water in creeks, rivers, or other watercourses, and in reservoirs, lakes, and ponds.

~~(eee)~~ (ggg) "Term permit" means a permit to appropriate water that is issued for a specified period of time and exceeds the criteria for a temporary permit specified in K.S.A. 82a-727, and amendments thereto, and K.A.R. 5-9-3 through K.A.R. 5-9-5. At the end of the



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specified time, or any authorized extension approved by the chief engineer, the term permit shall be automatically dismissed, and any priority it may have had shall be forfeited.

(~~ffff~~) (hhhh) "The production and return of saltwater in connection with the operation of oil and gas wells in accordance with the written approval granted therefor by the Kansas corporation commission pursuant to K.S.A. 55-901, and amendments thereto" means only that saltwater actually produced during the primary production of oil and gas wells and shall not include the following:

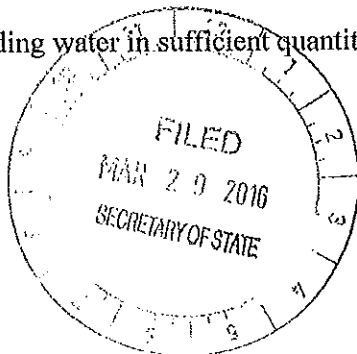
- (1) Saltwater used in the drilling of an oil and gas well; and
- (2) saltwater injected into an enhanced recovery injection well, unless that saltwater was produced in the primary production of the oil and gas well, separated from the oil and gas, and then subsequently reinjected.

(~~gggg~~) (iiii) "Thermal exchange" means the use of water for climate control in a nondomestic building and in a manner that is essentially nonconsumptive to the source of supply.

(~~hhhh~~) (jjjj) "Totalizer" means the mechanical or electronic portion of the register that displays the total quantity of water that has passed the water flowmeter sensor.

(~~kkkk~~) (llll) "Unconfined Dakota aquifer system" means that portion of the Dakota aquifer system not overlain by a confining layer in which the aquifer is in equilibrium with atmospheric pressure.

(~~mmmm~~) (nnnn) "Unconsolidated regional aquifer" means a body of mostly unconsolidated and heterogeneous water-bearing deposits that are hydraulically and geologically contiguous, and are capable of yielding water in sufficient quantities for beneficial use.



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~~(kkkk)~~ ~~(mmmm)~~ "Waste of water" means any act or omission that causes any of the following:

(1) The diversion or withdrawal of water from a source of supply that is not used or reapplied to a beneficial use on or in connection with the place of use authorized by a vested right, an appropriation right, or an approval of application for a permit to appropriate water for beneficial use;

(2) the unreasonable deterioration of the quality of water in any source of supply, thereby causing impairment of a person's right to the use of water;

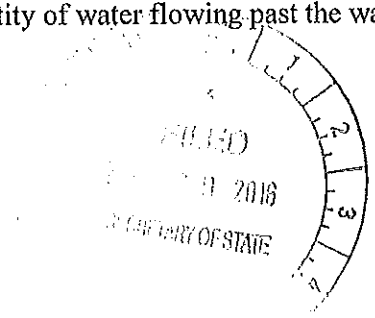
(3) the escaping and draining of water intended for irrigation use from the authorized place of use; or

(4) the application of water to an authorized beneficial use in excess of the needs for this use.

~~(HHH)~~ ~~(nnnn)~~ "Waterpower use" means the use of falling water for hydroelectric or hydromechanical power.

~~(mmmm)~~ ~~(oooo)~~ "Water balance" means the method of determining the amount of water in storage in a basin storage area by accounting for inflow to, outflow from, and changes in storage in that basin storage area.

~~(nnnn)~~ ~~(pppp)~~ "Water flowmeter" means the combination of a flow-sensing device, measuring chamber, integral or remote display device or register, and any connecting parts required to make a working assemblage to measure, record, and allow determination of flow rate and total quantity of water flowing past the water flowmeter sensor.



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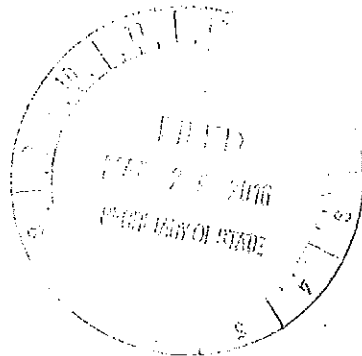
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(~~eeee~~) (qqqq) "Water storage device" means a reservoir, elevated water tank, pressurized water tank, including a bladder tank, or other container into which water is pumped and stored before beneficial use.

(~~pppp~~) (rrrr) "Water use correspondent" means a person designated in writing, on a form prescribed by the chief engineer, by one of the owners of a water right to file the water use reports required by K.S.A. 82a-732 and amendments thereto, on behalf of the owner or owners of that water right. (Authorized by and implementing K.S.A. 82a-706a; modified, L. 1978, ch. 460, May 1, 1978; amended May 1, 1980; amended May 1, 1981; amended May 1, 1983; amended May 1, 1986; amended Dec. 3, 1990; amended May 31, 1994; amended Sept. 22, 2000; amended Oct. 24, 2003; amended Oct. 31, 2008; amended P-April 29, 2016)



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George A. Austin P.E., L.S.
d.b.a. Aqueous Fortis Consulting

Examination of Model data and reports on the City of Wichita, *Equus* Beds Aquifer and Storage Recovery Project



Examination of Model data and reports on the City of Wichita, *Equus* Beds Aquifer and Storage Recovery Project

Background.

The matter was brought to my attention via a phone call from Tessa Wendling, Attorney-at-Law, on November 1, 2018. Subsequent meeting with Ms. Wendling on November 13, 2018, highlighted her client's concerns and the direction of my examination of the materials available. The main purpose of my examination would be to review any aspects of the input and output data of the Models used to simulate the effects of the groundwater pumping and recharge elements and account for the City of Wichita's administration of the *Equus* Beds Aquifer Storage and Recovery Project (ASR).

Procedure

Several publications were acquired through online means or were provided by Ms. Wendling. The publications were examined in connection to various concerns expressed by Ms. Wendling. Certain excerpts from the various publications were excerpted regarding the various concerns.

Model Data Files

Several data files were downloaded. Examination of the various files provided some information as to input and output of the USGS MODFLOW 2000 Model. Originally it was believed comparison the data sets used in different MODEL runs would be of value. After review of the data sets, it was determined that further comparisons would be better served based on the reported results in the various report.

Review of Reports

U.S. Geological Survey Scientific Investigation Report 2013-5042, *Simulation of Groundwater Flow, Effects of Artificial Recharge, and Storage Volume Changes in the Equus Beds Aquifer near the City of Wichita, Kansas Well Field, 1935–2008*, reports on the MODFLOW model used to simulate the effects of groundwater pumping, artificial recharge, precipitation, river and stream interactions, natural recharge and other factors on groundwater. Operation of MODFLOW, as calibrated, assigns quantifiable volumes for each of these effects.

There are scale and time distributions that limits the Model. "2. The groundwater-flow model was discretized using a grid with cells measuring 400 ft by 400 ft. Model results were evaluated on a relatively large scale and cannot be used for detailed analyses such as simulating water level drawdown near a single well. A grid with smaller cells would be needed for such detailed analysis." (p. 72, Model Limitations) and "Although irrigation pumpage was assumed to occur only in May through August, annual irrigation rates were calculated and used in the simulation." (p. 43). Additionally, "Groundwater pumpage data for 1935 to 1979 were obtained from Spinazola and others (1985) and Myers and others (1996). Groundwater pumpage for the stress periods from 1935 through 1979 was distributed in the model based on the spatial and temporal distribution of pumping in Spinazola and others (1985). The model cells from Spinazola and others (1985) are 1 mile on each side and pumping was assigned to the center of each cell. Pumping wells were placed in the current model to coincide with the center of each cell in the model from Spinazola *[highlight added]* and others (1985). Pumping was distributed vertically across

all model layers by using the MultiNode Well Package. Locations of simulated pumping wells for 1935 through 1979 are shown in figure 29." (p.39, Wells)

The grid scale and using annual rates rather than a distributed rate based on usage and the one-mile square grids are important because it shows the large scale of the impacts. The "cone of depression" of each well is aggregated at the one-square mile grid for 1935-1979 (rather than the 400' square grid for pumping after 1980 and other elements) which creates a deeper depression at one location rather than at the point of the actual well diversion. Clearly the MODFLOW Model does not address individual well impacts either in scale or location.

One of the priorities of the ASR was regarding the saltwater intrusion from the Burton well field and the Arkansas River. *"In March 2006, the city of Wichita began construction of the Equus Beds Aquifer Storage and Recovery project to store and later recover groundwater, and to form a hydraulic barrier to the known chloride-brine plume near Burrton, Kansas. In October 2009, the U.S. Geological Survey, in cooperation with the city of Wichita, began a study to determine groundwater flow in the area of the Wichita well field, and chloride transport from the Arkansas River and Burrton oilfield to the Wichita well field."* (p.1, Abstract) And *"Sophocleous (1983) simulated chloride transport in the Equus Beds aquifer, Spinazola and others (1985) developed a model to simulate groundwater flow and chloride transport in the Equus Beds aquifer and underlying Wellington Formation..."* (p.6, Previous studies)

US Geological Survey, Scientific Investigations Report 2010–5023. Water Quality in the Equus Beds Aquifer and the Little Arkansas River Before Implementation of Large-Scale Artificial Recharge, South-Central Kansas, 1995–2005

The Study of the movement of the chloride in the Equus Beds as reported by SIR 2010-5023 provides the basis of the ASR water quality. *"The primary sources of chloride to the Equus Beds aquifer are from past oil and gas activities near Burrton and from the Arkansas River. Computed chloride concentrations in the Little Arkansas River near Halstead exceeded the Federal SDWR of 250 mg/L about 27 percent of the time (primarily during low-flow conditions). Chloride concentrations in groundwater exceeded 250 mg/L in about 8 percent or less of the study area, primarily near Burrton and along the Arkansas River. Chloride in groundwater near Burrton has migrated downgradient about 3 miles during the past 40 to 45 years. The downward and horizontal migration of the chloride is controlled by the hydraulic gradient in the aquifer, dispersion of chloride, and discontinuous clay layers that can inhibit further downward migration. Chloride in the shallow parts of the Equus Beds aquifer migrated less than 0.5 mile during the past decade. Migration is slower because of the decrease in the hydraulic gradient since 1992. On the basis of these results, artificial recharge (especially at depths of 100 to 150 feet) could create an effective barrier to saltwater migration."* (p. 1, Abstract) The rise of groundwater elevations in the Basin Storage Area would lessen the groundwater hydraulic gradient and therefore, movement of the chloride would be slowed. Of course, the barrier to saltwater migration is related to the Wichita well field. There's no forecast as to whether the chloride plume will move in a different direction nor if that movement would be accelerated. Generally, comparison of groundwater elevations does not indicate a change in direction.

ASR Permit Modification Proposal Revised Minimum Index Levels & Aquifer Maintenance Credits by Burns & McDonnell, 3/21/2018.

The studies also do not address the lowering of the index elevation the 1993 levels which were historical lows. The pumping to the lower levels would increase hydraulic gradients and potentially accelerate the movement of chlorides.

Another important element in the Modification Proposal is changing the recharge accounting from the current Model driven accounting to a routine calculation. "A one-time, five percent (5%) initial loss will be deducted from the total number of AMCs applied in each index cell. This initial loss accounts for losses to the aquifer inherent in the injection and recovery process. An average annual recurring loss of three percent (3%) will be applied annually to recharge credits to account for recharge credit migration from the BSA. This recurring loss will be gradational geographically across the BSA..." (p. 4-3) In the model-based accounting, based upon the report's tabulation, the increase in the accumulated credits from 2006 to 2015 would increase from 4978 acre-ft to 5867 acre-ft (p. 4-6, Table 4-2). The values used are the calculated recharge credits from Model calculations. The Aquifer Maintenance Credits would be based on the City of Wichita diversions from the Little Arkansas River, which are reported in the Recharge credit reports. The amount in 2015 was reported at 1,048 acre-ft of the 2925 af diverted or about 36%. (p.2-4, Aquifer Storage and Recovery Project,2015 Annual Accounting Report prepared for City of Wichita, Kansas February 2018) Approximately, 9 percent of the water pumped to the water treatment plant was used in operation. This would indicate if AMC concept is adopted the initial losses should be at least that 9%.

The authors of this report had available to them, recharge values based on river flows infiltrating in to the Basin Storage Area Index Cells or outflowing to the river. In the USGS SIR 2013-5042, the dilemma of assigning a credit to use of river water rather than groundwater pumping results in the following contradiction "Increasing recharge either increases flow from the aquifer to the Arkansas and Little Arkansas Rivers or decreases flow from the rivers to the aquifer." (p. 66 *ibid*). The previous quote offers two choices in the impact of increasing recharge, when really the it is a composite of the two. For instance, in the same report, during the steady-state simulation flow budget, inflow into the groundwater system represents 30.5% of the total inflows second only to the 64.7% from natural recharge but represents 51.8 % of the total outflows. (See Reproduced Table 8 below.) (p.48 *ibid*.)

Table 8. Steady-state calibration simulation flow budget.
[ft³/day, cubic feet per day; acre-ft/day, acre feet per day; --, not applicable]

Budget component	Flow rate, in ft ³ /day	Flow rate, in acre-ft/day	Percent of total flow
Inflow			
Head dependent boundaries	2,320,409	53.3	4.7
Recharge	31,855,858	731.3	64.7
River leakage	15,024,649	344.9	30.5
Well pumping	0	0.0	0.0
Total in	49,200,916	1,129.5	100
Outflow			
Head dependent boundaries	1,167,715	26.8	0.2
Evapotranspiration	18,569,682	426.3	38.8
Drains	2,129,863	48.9	4.6
River leakage	25,165,966	577.7	51.8
Well pumping	2,204,735	50.6	4.6
Total out	49,237,960	1,130.3	100
Total in - out	37,044	0.9	
-Percent difference	-0.08	-0.08	

In 2015, the Aquifer Storage and Recovery Project, 2015 Annual Accounting Report prepared for City of Wichita, Kansas February 2018, reported that *"Infiltration from the Little Arkansas River throughout the Basin Storage Area was approximately 5204 acre-feet, ... The model shows that a total of 38,717 acre-feet of water migrated from the aquifer in the Basin Storage Area to the Little Arkansas River in 2015."* (P. 4-7.)

Conclusion and Findings

The review of the data and the reports indicate substantial scientific fit to the measured conditions. However, the MODFLOW model cannot be used to look at individual impacts with any degree of certainty. The scale both geographically and temporally are large enough that impacts are general to the study area rather than specific to any one location.

The Aquifer Maintenance Credit concept doesn't take in account the fact the stream flow diverted to the water treatment plant and then piped to Wichita is in part, outflow from the aquifer and the diversion stream flow is subtracting from water available for aquifer infiltration. In 2015, the infiltration from the Little Arkansas River was 5,204 AF and outflows to the Little Arkansas River were 38,717 AF. This would indicate that if a proportional factor based on the infiltration to total surface-water/groundwater interaction were applied that only 11.8 percent of the diversion would possibly be assigned as AMC. At the steady-state, the proportion of the total surface water – groundwater interaction, is 38 percent infiltration. This indicates that the quote from the MODFLOW report: *"Increasing recharge either increases flow from the aquifer to the Arkansas and Little Arkansas Rivers or decreases flow from the rivers to the aquifer"* reflect the rise in recharge storage levels.

Water quality related to the chloride plume indicated that the restoration of the Equus Bed Aquifer to historic levels does serve as a barrier to movement towards the Wichita well field. The studies do not forecast future movement, though pumping the aquifer to levels below historical levels would certainly accelerate movement towards the pumping source.

The references and their hyperlinks that I reviewed at least partially are listed below

<https://pubs.usgs.gov/sir/2010/5023/> Water Quality in the Equus Beds Aquifer and the Little Arkansas River Before Implementation of Large-Scale Artificial Recharge, South-Central Kansas, 1995–2005 Scientific Investigations Report 2010–5023

<https://pubs.usgs.gov/sir/2013/5042/sir2013-5042.pdf> Simulation of Groundwater Flow, Effects of Artificial Recharge, and Storage Volume Changes in the Equus Beds Aquifer near the City of Wichita, Kansas Well Field, 1935–2008. Scientific Investigations Report 2013–5042.

<https://pubs.usgs.gov/sir/2014/5185/pdf/sir2014-5185.pdf> Status of Groundwater Levels and Storage Volume in the Equus Beds Aquifer near Wichita, Kansas, 2012 to 2014. Scientific Investigations Report 2014–5185.

<https://pubs.usgs.gov/sir/2016/5042/sir20165042.pdf> Effects of Aquifer Storage and Recovery Activities on Water Quality in the Little Arkansas River and Equus Beds Aquifer, South-Central Kansas, 2011–14 U.S. Department of the Interior U.S. Geological Survey Scientific Investigations Report 2016–5042

<https://pubs.usgs.gov/sir/2015/5121/sir20155121.pdf> Groundwater-Level and Storage-Volume Changes in the Equus Beds Aquifer near Wichita, Kansas, Predevelopment through January 2015 Scientific Investigations Report 2015-5121

<https://pubs.usgs.gov/sir/2016/5165/sir20165165.pdf> Status of Groundwater Levels and Storage Volume in the Equus Beds Aquifer near Wichita, Kansas, January 2016 Scientific Investigations Report 2016-5165

<https://www.agriculture.ks.gov/WichitaASR> Division of Water Resources, Kansas Department of Agriculture. Link to various reports and documents.

GEORGE AUSTIN

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EDUCATION

Kansas State University Degree obtained BS in Civil Engineering	Year 1976
Emporia State University Degree obtained BS in Physics	Year 1975

RELATED EXPERIENCE

Finney County, Kansas Assistant County Engineer Review of Flood Plain Mapping, Inspection of Center Pivot Irrigation including Aerial Photogrammetry for Road location, Registered Land Surveyor, Licensed Radiological Monitor, Certified Landfill Operator, inspected Bridges and Culverts, Road Design and Pavement Design	June 1976 – December 1977
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Kansas Department of Agriculture Dam Safety Engineer Conduct Inspections of Dams and other water obstructions. Determined land ownership. Attended U.S. Corps of Engineer Training on Satellite Remote Sensing, Dam Breach Program. Wrote Flood Routing Program that included hydraulic computations for spillways to be used in the Flood Routing. Attended Interagency conferences on Environmental Coordination Act. Attended University of Kansas Graduate Course based on National Water Policy.	December 1977 – June 1986
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Kansas Department of Agriculture Water Structures Section Head Oversaw the Operation of the Section which regulated and permitted Bridges, Dams, Channel Changes, Levees and Flood Plain Management. Updated Kansas Regulations on Water Structures.	June 1986 – June 1996
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Kansas Department of Agriculture Administrative Hearing Officer Conducted Hearings related to the Kansas Water Appropriations Act. Issued Findings and Order based on testimony.	March 1988 – March 1989
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Kansas Department of Agriculture Senior Engineer Oversaw the Operation of the Section which regulated and permitted Bridges, Dams, Channel Changes, Levees and Flood Plain Management. Conducted inspection preparation of reports and corrective orders.	June 1996 – March 1999
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Association of State Dam Safety Officials State of Kansas Representative Member, Western Regional Member, Executive Board Member Provided Kansas representation, worked with Federal Emergency Management Agency, National Dam Inventory	1987 - 1998
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Kansas Department of Agriculture Engineer, Interstate Litigation Team U.S. Supreme Court Case, Original No.126 regarding compliance with the Republican River Compact. Supervised the production of documents. Field Verified Surface and Ground Water Irrigation diversions. Installed lake water level monitors. Reviewed Expert Reports and analyzed River gage data related to compliance. U.S. Supreme Court Case, Original No, 105 regarding compliance with the Arkansas River Compact. Reviewed Expert Reports, participated in witness testimony review, digitally memorialized Court Exhibits for reproduction and projection during trial. Participated in preparation for Oral Arguments before the U.S. Supreme Court. Participated in settlement conferences with Colorado. Created Arkansas River Model (Muskingum Method) adopted by Colorado and Kansas as the accounting method for Stateline river flow deliveries.	March 1999 – December 2007
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PUBLICATIONS AND PAPERS

Kansas Disaster Report, FEMA DR 1000. Federal Emergency Management Agency	1993
<i>"Appendix F.2 Agreement concerning the Offset Account in John Martin Reservoir for Colorado Pumping, Determination of credits for Delivery of the Water Released for Colorado Pumping , And Related Matters."</i>	
Fifth and Final Report, Volume II, Arthur L. Littleworth, Special Master, U.S. Supreme Court	2008
<i>"River Routing Model, Upper Arkansas River, Kansas"</i>	
Engineering Report by George A. Austin, P.E.	2018

MEMBERSHIPS

- Kansas Society Land Surveyors
- Association of State Dam Safety Officials
- Jayhawk Area Council Boy Scouts of America, Executive Board

Minimum Desirable Stream Flow met or exceeded throughout the study period (Achievement of MDS)

Percent of Achievement of MDS					
Water Years	Water Years	Water Years	Water Years	Water Years	Water Years
1969-1978*	1979-1988*	1989-1998*	1999-2008	2009-2018^	2011-2012^
98.30%	91.20%	85.60%	Not tested	83.80%	63.4%

*From study "Historical Achievement of MDS, KWO, KGS 2000
 ^Prepared by George A. Austin 12/7/2019 using USGS
 published streamflow data at Gage: USGS 7144200 L
 ARKANSAS R AT VALLEY CENTER, KS . Downloaded 12/2/2018.



Last revision: 11/30/00 -- dy

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In-Stream Water Resources and Historic Achievement of Minimum Desirable Streamflows (MDS)

D. P. Young, E. D. Lewis, and B. B. Wilson

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[Classification](#)

[A. Streamflow Reliability](#)

[B. Water Quality](#)

[Historic Achievement of Minimum Desirable Streamflows \(MDS\)](#)

Introduction: This section provides a survey of some of the water quantity (streamflow) and water quality (salinity) factors that influence the potential use of surface water to meet increasing water demand or possible future competition for presently available water. In the overall spirit of the triage approach, available data have been used to develop overview classifications of the regions (subbasins) in which surface water may be available under some conditions (the Streamflow Reliability section), and in which potential use might be limited by certain types of water quality considerations (salinity -- discussed in the Water Quality section). Because regulatory factors and time trends in the resource itself are both important considerations, an analysis of the historic achievement of Minimum Desirable Streamflow targets is included, and where they exist they are used in place of the absolute flow values to determine water availability.

The assessment is preliminary, and incomplete in some areas because data are not readily available. Streamflow reliability, for example, can be estimated in the "no data" subbasins, and confirmed on the basis of various types of information. This is a slower and more labor-intensive process, and one that probably should be undertaken only after the priorities of need for information are assessed. Similarly, although the Total Maximum Daily Load process has not yet worked through all of the state's basins in terms of water quality, initial estimates can be made and confirmed once there is some degree of consensus on the most important areas and issues.

Agency and stakeholder feedback on the issues of prioritization is solicited.

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Classification:

A. Streamflow Reliability: Streamflow represents a large quantity of water, but its temporal variability may make it unreliable for a sole supply. In this triage-based approach to potential surface-water availability, streamflows were classified by reliability at the HUC_8 subbasin level. Streamflow hydrographs were constructed from daily mean discharge data obtained from the USGS [<http://waterdata.usgs.gov/nwis-w/KS/>]. Classification was based on visual inspection of the hydrographs and associated data. Data from the past thirty years were compiled, however most emphasis was placed on data from the past ten years. The subbasin as a whole was assumed to be represented by the gages in or immediately downstream of the subbasin.



Streamflows in some basins are subject to Minimum Desirable Streamflows (MDS). In basins subject to MDS, the MDS values were used as a baseline for the classification. In other basins, absolute streamflow was used (baseline value = no flow).

Other than MDS, limitations on use imposed by regulations, contracts or water appropriations were not assessed. The classification is based on actual observed streamflows, and does not mean that flows are necessarily available for withdrawal, or practical to use.

The three classes of streamflow reliability were defined as follows:

Class 1-- streamflow essentially always 100 cfs greater than baseline (indicating continuous withdrawal may be feasible);

Class 2 -- streamflow essentially always 10 cfs but not 100 cfs greater than baseline (indicating withdrawals for supplements or conjunctive use may be feasible essentially every year); and

Class 3 -- flows below 10 cfs have occurred at least two periods in the past ten years and flows less than 1 cfs have occurred (probably not a reliable water source).

The streamflow reliability classes for the HUC-8 subbasins are listed in [Table 1](#) and mapped in [Figure 1](#). Table 1 also lists in which basins the classification was influenced by MDS status, and notes those with no data or special conditions. The overwhelming majority of the basins fall into Class 3, suggesting that the potential for streamflow meeting future water demand is very limited in most basins, except where conjunctive use or off-line storage is available.

Note that in Class 3 basins, intermittent withdrawals for supplemental use may be feasible on many of the streams. However, another level of investigation is required to identify these basins. So many factors are involved in assessing the amount of streamflow potentially usable that it requires detailed site-specific analysis. An example is the Little Arkansas River, where a [pilot study](#) is underway to assess "harvesting" bank storage during high flows.

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Basins with stream segments known to be impacted by salinity (primarily chloride and/or sulfate) are listed in [Table 2](#) and shown in [Figure 2](#). As Figure 2 indicates, much of the surface water in central and southwestern Kansas is water-quality limited by salinity.

The salinity classification does not distinguish between natural and anthropogenic sources. The Arkansas River contains high concentrations of sulfate where it enters Kansas from Colorado.

Streams in other basins receive salinity from discharge of bedrock formations containing mineralized water. This is the primary source of salinity in much of central Kansas and in the Cimarron basin. The primary anthropogenic sources are oil brine, and salt-mine and water-softener wastes.

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Historic Achievement of Minimum Desirable Streamflows (MDS)

Introduction: During the 1980 session, the Kansas Legislature established as an amendment to the Water Appropriation Act the concept of minimum desirable streamflows (MDS). Although the reasons for establishing minimum desirable streamflows and their chosen locations vary, the State Water Planning Act indicates that the main reasons for identification of MDS are to "preserve, maintain or enhance baseflows for instream water uses relative to water quality, fish, wildlife, aquatic life, recreation, general aesthetics and domestic uses and for the protection of existing water rights" (K.S.A. 82a-928 (i)).

Revisions of MDS were made to the Kansas Water Appropriation Act in 1984, 1985, 1987 and 1989. In 1984 MDS values were established on the Marais des Cygnes, Neosho, Cottonwood and Little Arkansas Rivers and given a priority date of April 12, 1984. This in essence gives the MDS values the force and effect of a water right. The 1984 legislation also established that any minimum desirable streamflow identified and established pursuant to law by July 1, 1990 would have a priority date of April 12, 1984. To date, MDS values have been established at 33 sites on 23 streams and rivers in the State.

Two methods are used to administer and protect minimum desirable streamflows. For sites that are located on regulated streams below reservoirs that contain State-owned storage, releases are made from the reservoirs to supplement low streamflow conditions. This includes fish spawning flows during April, May and June if the appropriate reservoirs are holding water in the flood pool.

The second method of MDS enforcement is administration of "junior" water rights, including surface water rights and hydraulically-connected alluvial groundwater rights, that are located above the respective MDS gage location. Thus, any such appropriation filed after April 12, 1984 ("junior" right) could be cut off during periods of low flow. No rights filed prior to April 12, 1984 ("senior" right) would be affected.

The goal of minimum desirable streamflows is not to keep streams flowing through all climatic conditions. Since the main remedies for low flow under the MDS process are either releases from reservoirs or administration of "junior" water rights, MDS does not address severely dry conditions on unregulated streams or extended droughts on regulated streams. The purpose of minimum desirable streamflows is to protect flow from depleted conditions as a result of extensive water appropriation.

MDS Values and Administration Areas: Established minimum desirable streamflows are listed in [Table 3a](#), which includes the USGS gaging stations where flows are monitored. Spawning flows for fisheries on regulated streams are presented in [Table 3b](#). The USGS gages used to monitor

streamflows and the stream segments potentially subject to MDS administration are shown in [Figure 3](#). Surface water rights on the highlighted stream segments and ground water rights in the alluvial aquifers along these stream segments are potentially subject to MDS administration.

Achievement of MDS: Daily mean discharge data for the past 30 years were examined and compared with MDS values to assess historic achievement of MDS. Discharge data were obtained from the USGS website [<http://waterdata.usgs.gov/nwis-w/KS/>]. The data were separated into ten-year blocks representing the 1970's, the 1980's, and the 1990's in order to assess temporal variation. Percent achievement for each of the ten-year intervals is tabulated in [Table 4](#), which is sorted by percent achievement in the 1990's. At 7 of the 33 sites, MDS were achieved less than 80 percent of the time; at 14 sites MDS were achieved between 80 and 95 percent of the time; and at the remaining 12 sites MDS were achieved more than 95 percent of the time. The locations of the sites in each of these three categories are shown in [Figure 4](#). The extent of the High Plains aquifer and HUC_8 subbasin boundaries are also shown for reference.

Hydrographs showing the daily mean streamflows and the MDS criteria are available for viewing by clicking on the appropriate gage listing in [Table 4](#). Because streamflows range over orders of magnitude, it is necessary to use a log scale to plot discharge on the hydrographs. Note that zero values do not plot on a log scale. For example, the apparent lack of data on the Arkansas River at Kinsley (station 07140000) in parts of 1994 and 1995 actually represents no flow.

As [Table 4](#) indicates, achievement of MDS was lower in the 1990's compared to the 1970's at most sites despite the wet weather during the mid-1990's. This paralleled the trend of generally lower median streamflows in the state in the 1990's. However, flows on many streams increased substantially during the mid-1990's.

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Funded (in part) by the Kansas Water Plan Fund

In-Stream Water Resources and Historic Achievement of Minimum Desirable Streamflows (MDS)

D. P. Young, E. D. Lewis, and B. B. Wilson

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A. Streamflow Reliability

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Historic Achievement of Minimum Desirable Streamflows (MDS)

Introduction: This section provides a survey of some of the water quantity (streamflow) and water quality (salinity) factors that influence the potential use of surface water to meet increasing water demand or possible future competition for presently available water. In the overall spirit of the [trage approach](#), available data have been used to develop overview classifications of the regions (subbasins) in which surface water may be available under some conditions (the Streamflow Reliability section), and in which potential use might be limited by certain types of water quality considerations (salinity -- discussed in the Water Quality section). Because regulatory factors and time trends in the resource itself are both important considerations, an analysis of the historic achievement of Minimum Desirable Streamflow targets is included, and where they exist they are used in place of the absolute flow values to determine water availability.

The assessment is preliminary, and incomplete in some areas because data are not readily available. Streamflow reliability, for example, can be estimated in the "no data" subbasins, and confirmed on the basis of various types of information. This is a slower and more labor-intensive process, and one that probably should be undertaken only after the priorities of need for information are assessed. Similarly, although the Total Maximum Daily Load process has not yet worked through all of the state's basins in terms of water quality, initial estimates can be made and confirmed once there is some degree of consensus on the most important areas and issues.

Agency and stakeholder feedback on the issues of prioritization is solicited.

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Classification:

A. Streamflow Reliability: Streamflow represents a large quantity of water, but its temporal variability may make it unreliable for a sole supply. In this triage-based approach to potential surface-water availability, streamflows were classified by reliability at the HUC_8 subbasin level. Streamflow hydrographs were constructed from daily mean discharge data obtained from the USGS (<http://waterdata.usgs.gov/nwis-w/ks/>). Classification was based on visual inspection of the hydrographs and associated data. Data from the past thirty years were compiled, however most emphasis was placed on data from the past ten years. The subbasin as a whole was assumed to be represented by the gages in or immediately downstream of the subbasin.

Streamflows in some basins are subject to Minimum Desirable Streamflows (MDS). In basins subject to MDS, the MDS values were used as a baseline for the classification. In other basins, absolute streamflow was used (baseline value = no flow).

Other than MDS, limitations on use imposed by regulations, contracts or water appropriations were not assessed. The classification is based on actual observed streamflows, and does not mean that flows are necessarily available for withdrawal, or practical to use.

The three classes of streamflow reliability were defined as follows:

Class 1 -- streamflow essentially always 100 cfs greater than baseline (indicating continuous withdrawal may be feasible);

Class 2 -- streamflow essentially always 10 cfs but not 100 cfs greater than baseline (indicating withdrawals for supplements or conjunctive use may be feasible essentially every year); and

Class 3 -- flows below 10 cfs have occurred at least two periods in the past ten years and flows less than 1 cfs have occurred (probably not a reliable water source).

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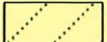
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Intervenors' Wells in the ASR Basin Storage Area – JOSH CARMICHAEL - ▲

Legend

-  ASR Pipeline
-  GMD2 Border
-  ASR cells

ASR facilities

-  Bank Storage Wells
-  Proposed Recovery Well
-  Authorized Recovery Well
-  Surface Water Intake
-  Other Authorized Diversions

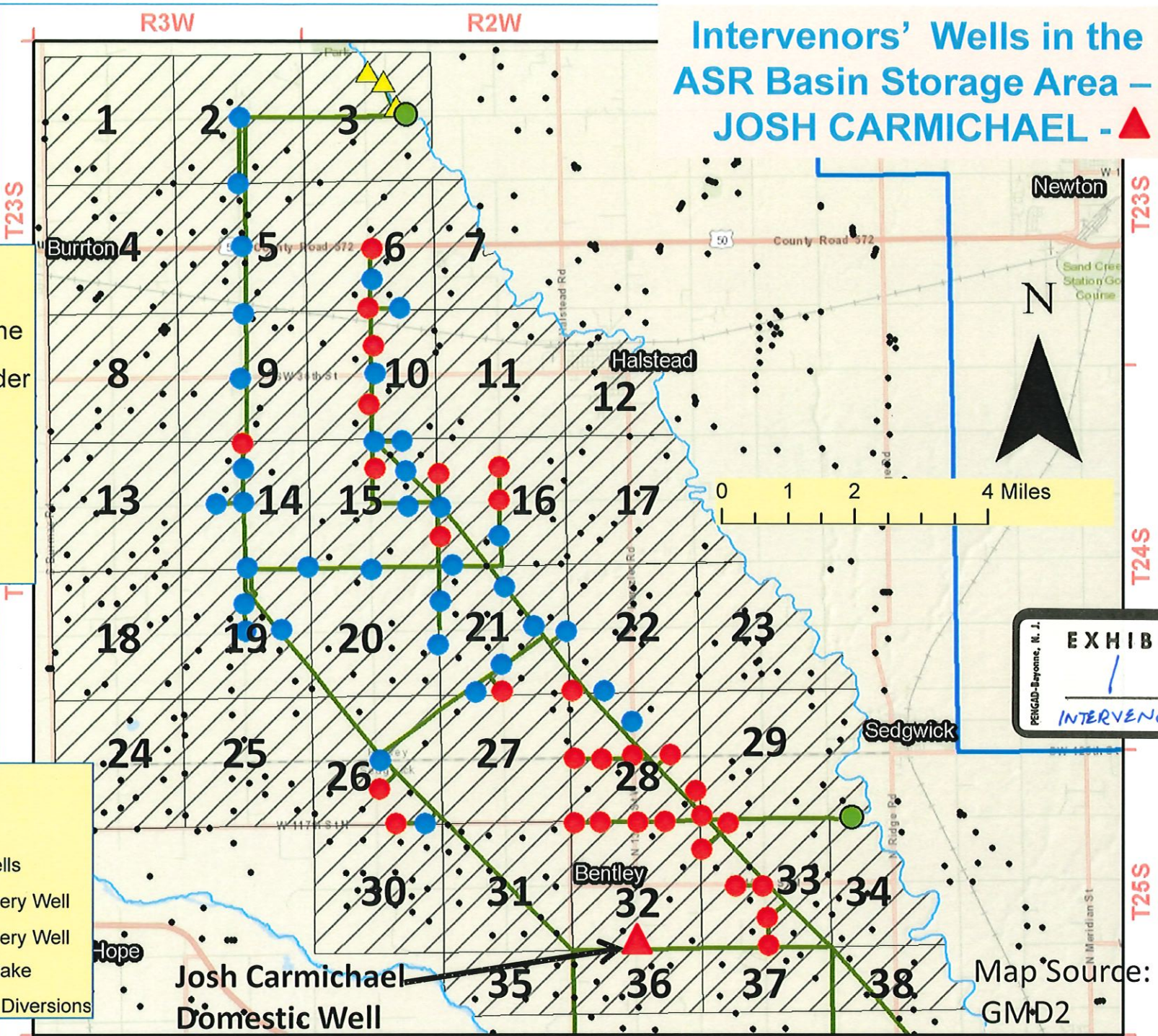




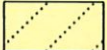
EXHIBIT
1
INTERVENOR

Map Source:
GMD2






Josh Carmichael
Domestic Well

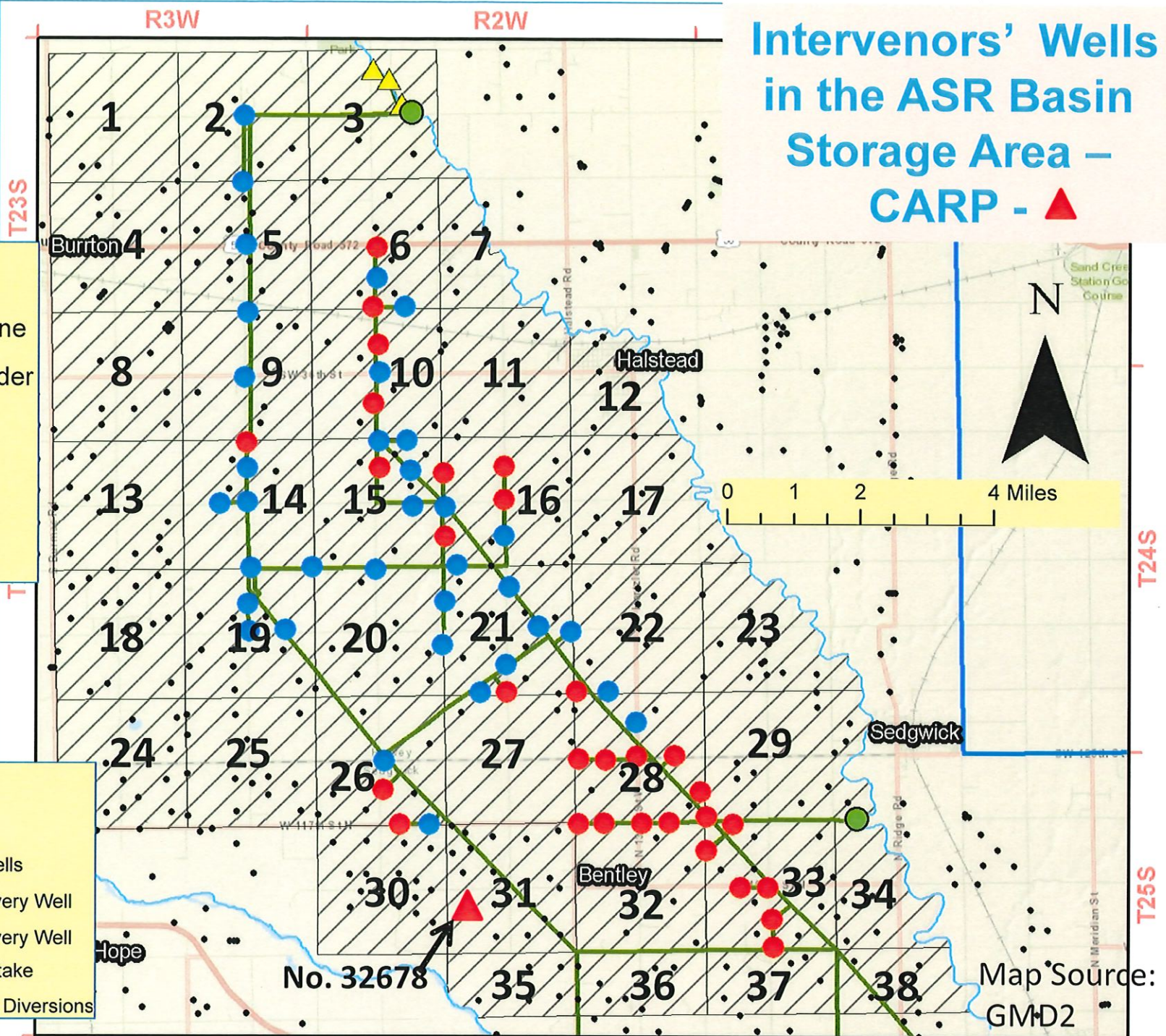
Intervenors' Wells in the ASR Basin Storage Area – CARP - ▲

Legend

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-  GMD2 Border
-  ASR cells

ASR facilities




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Map Source:
GMD2

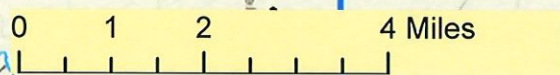
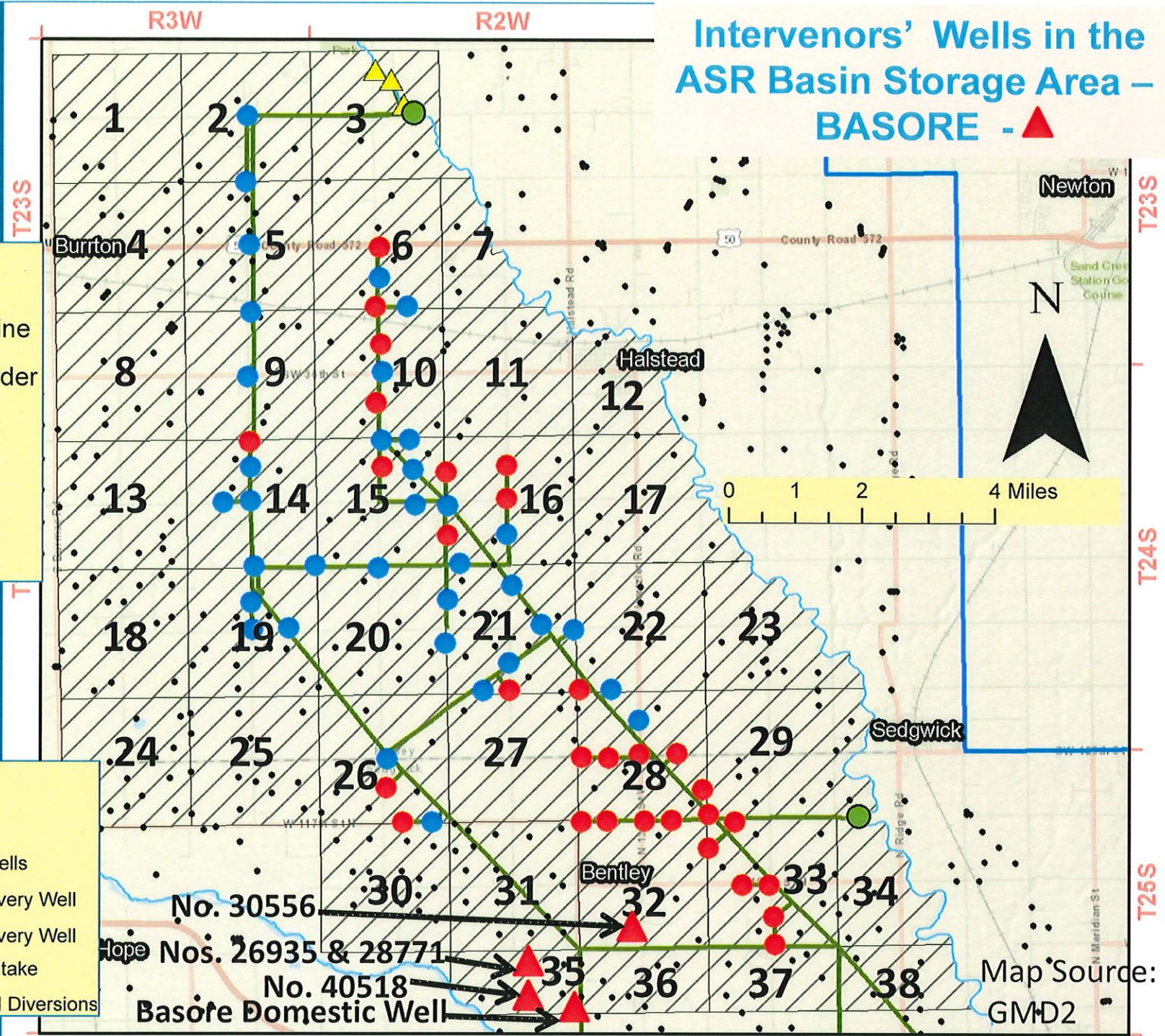
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