CV for Lane Letourneau

Work experience:

Jan. 2006 to present:

- Kansas Department of Agriculture, Division of Water Resources, Water Appropriation Program Manager.
  - Administer the Kansas Water Appropriation Act to allocate the state's water and protect private property rights.

August 1989 to January 2006:

- Kansas Department of Agriculture, Division of Water Resources, Environmental Scientist IV
  - Unit Head for the Water Use, Certificate, Compliance and Enforcement Unit of the water rights section

June 1987 to July 1989:

- Kansas Department of Agriculture, Division of Water Resources, Hydrologist I
  - New and Change Application Unit of the water rights section.

January 1983 to June 1986:

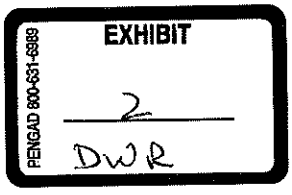
- Great Guns Perforating and Logging, Open and Cased Hole Engineer.

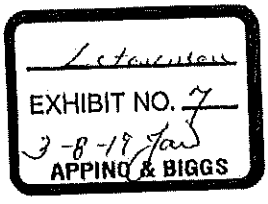
Education:

- B.S. Geology, Fort Hays State University

License:

- Professional Geologist
  - Kansas License No. 107





STATE OF KANSAS
BEFORE THE DIVISION OF WATER RESOURCES
KANSAS DEPARTMENT OF AGRICULTURE

In the Matter of the City of Wichita's	)	
Phase II Aquifer Storage and Recovery Project	)	**Case No. 18 WATER 14014**
In Harvey and Sedgwick Counties, Kansas.	)	
	)	

Pursuant to K.S.A. 82a-1901 and K.A.R. 5-14-3a.

DWR's PRE-HEARING BRIEF AND WRITTEN TESTIMONY

For its pre-hearing brief and written testimony regarding the formal-phase hearing of this matter, the Kansas Department of Agriculture, Division of Water Resources (hereinafter "DWR"), states as follows:

I. CATALYST FOR WICHITA'S PROPOSAL

The proposal at issue in this matter, Wichita's *ASR Permit Modification Proposal: Revised Minimum Index Levels & Aquifer Maintenance Credits*, dated March 12, 2018 (the "Proposal"), apparently originated because of the 2011–12 drought.

In 2011 Kansas was in a severe drought. DWR was contacted by the SW Kansas Irrigation Association because their member irrigators were in a real bind: the irrigators engaged in double-cropping practices, and the drought was requiring more water on wheat, their first crop of the year. Accordingly, they were on track to not have enough authorized water left to finish corn, their second crop of the year. Their corn, moreover, was already sold on guaranteed contracts.

DWR helped alleviate the irrigators' drought problem by authorizing drought term permits. The drought term permit provided a two-year quantity of water in 2011 by borrowing from a water right's authorized quantity for 2012. DWR did not want the water already diverted for corn to be wasted because of an insufficient authorized amount of remaining water, which would have

resulted in a reduced crop yield. The drought extended into 2012 and so it became apparent that the two-year drought term permits issued in 2011 would not provide enough authorized water for both the 2011 and 2012 calendar years. Accordingly, legislation was enacted to allow the drought term permits to be enrolled into multiyear (i.e., five-year) flex accounts with any 2011 overpumping forgiven.

The intense irrigation and other drought-related water uses in 2011–12 created an unintended consequence to the City of Wichita. During this drought period the water level in Wichita's Equus Beds Wellfield (the "Wellfield") dropped to near the minimum index level that previously had been set as a result of DWR's approving applications related to Wichita's ASR project. That approval had allowed Wichita to withdraw certain accumulated recharge credits, but only if the water level in the Wellfield was above the established minimum index level. Because the drought caused the water level to approach the minimum index level, Wichita was concerned about the prospect of being prevented from diverting any recharge credits they had accumulated. It was this unintended consequence of the drought that started Wichita's discussions about changing the goal of its entire ASR project. DWR, therefore, began working with Wichita as they desired to repurpose their ASR project from a supplemental water-supply source to a long-term drought-protection project.

II. WICHITA'S CURRENT ASR PROJECT

Wichita's two major sources of water are the Equus Beds Aquifer (the "Aquifer") and Cheney Reservoir. Prior to the drought of 2011–12, Wichita obtained approximately half of its water from each source.

After water levels in both the Aquifer and Cheney Reservoir dropped during the 2011–2012 drought, Wichita decided to start using Cheney Reservoir move aggressively to avoid

evaporation loss. Wichita now diverts a higher percentage of their public water supply from Cheney Reservoir and only obtains about 20% of their water supply from the Aquifer. As a result of such change in Wichita's water management, the Aquifer has recovered to near pre-development conditions. This is better for everyone but hampers Wichita's ability to continue to accumulate recharge credits under current rules.

Under the current provisions of Wichita's ASR project that DWR approved, when water flows in the Little Arkansas River are high enough and there is room in the portion of the Aquifer designated as the "Basin Storage Area" (the "BSA"), Wichita may divert surface water from the Little Arkansas River, treat it through Wichita's ASR-project water-treatment facility, and then inject the treated water into the BSA for Wichita's future use. Such injected, treated water is different water than what would naturally be found in the Aquifer. The BSA is basically treated as an underground reservoir to store this treated water. Losses from this underground reservoir are in the form of leakage out of the BSA, compared to evaporation loss that occurs in above-ground reservoirs such as Cheney Reservoir. The BSA can be considered as the "box" in which Wichita can operate its ASR project and store water underground, for future use. That "box" equals 120,000 acre-feet of space in the Aquifer, as previously determined by the USGS model.

III. WICHITA'S PROPOSAL

In re-purposing the ASR project via the Proposal, DWR understands that Wichita seeks to: (1) manage the project so that there is enough water in the Aquifer both for Wichita and for the wellfield neighbors during and immediately after a drought, and (2) keep the Aquifer as full as possible, for as long as possible.

Wichita currently owns water rights in the Aquifer that are authorized to withdraw approximately 40,000 acre-feet of water annually. Wichita is planning for an 8-year, 1% drought

when Cheney Reservoir will eventually be depleted and Wichita will need to withdraw about 60,000 acre-feet of water from the Aquifer in 1 or 2 years during an eight year period of a 1% chance drought. Wichita would pump their 40,000 acre-feet of water rights first and then withdraw from their accumulated recharge credits, as needed. The recharge credits do not renew annually but go away either when they are pumped or when they seep out of the BSA.

The modeling provided by Wichita shows that in the worst case, at the end of such an 8-year, 1% drought, the Aquifer would remain about 80% full. That is with all current pumping, including domestic, municipal, irrigation, and the other beneficial uses operating in the Wellfield. The modeling also shows in the same drought that the maximum quantity that Wichita would need from the Wellfield is 59,907 acre-feet of water. This is a combination of 40,000 acre-feet of native water rights and 19,907 acre-feet in recharge credits.

The two main features of Wichita's Proposal, i.e., the two main proposed modifications to the existing Wichita ASR terms and conditions, are to (1) lower the minimum index cell levels so that Wichita can better access any accumulated recharge credits (of whatever type allowed) during long-term drought, and (2) allow Wichita to accumulate recharge credits, in the form of Aquifer Maintenance Credits ("AMCs"), for Wichita's ASR operations when the Aquifer is full.

A. Lowering Minimum Index Cell Levels

Although Wichita proposes to lower the minimum index levels, DWR does not believe that the proposed new levels are that significant compared to the practical saturated thickness of the Aquifer. Indeed, if as a result of a 1% drought the water levels were to actually drop to the proposed minimum index levels under the Proposal, then according to Wichita's modeling the Aquifer still would be approximately 86% full across the Wellfield and 89% full across the entire

BSA. Accordingly, at this time DWR does not believe that such a lowering would amount to an unreasonable lowering of the water levels.

When the Aquifer levels were as low as they were in 1993, DWR did not receive any impairment complaints in the Wellfield area, to its knowledge. Thus at this time DWR does not believe it is likely that the lowering of the minimum index levels under the Proposal would result in the impairment of existing water rights. Furthermore, Wichita has indicated its commitment to protecting existing rights. If the Chief Engineer approves the proposed lower minimum index levels and then subsequently some owner of a water permit or right claims that Wichita's ASR activity is causing impairment, then DWR will investigate pursuant to its normal procedures and, if DWR determines that such impairment has occurred, then DWR will curtail Wichita's pumping or otherwise act to cure the impairment.

B. Accumulating AMCs

Currently, in order to accumulate recharge credits under Wichita's existing approved ASR program, there must be space in the BSA in which Wichita can inject treated water from the Little Arkansas River. When the BSA is full and at its maximum index cell level, Wichita cannot inject water into recharge wells under the current terms of its ASR project.

To accumulate ASR recharge credits when the BSA is full, Wichita could, under the existing conditions of their water rights, divert non-ASR water from the BSA wells, thereby creating a "hole" or space in the BSA. Then Wichita could inject treated surface water from the Little Arkansas River (assuming flows are high enough to allow it) and create ASR recharge credits for Wichita's future use. DWR believes that this would be an inefficient way to manage the Aquifer and operate the ASR project—i.e., pumping water out just in order to create space to put water right back in, so that ASR recharge credits could be accumulated. Moreover, leaving water

in state generally is preferable to frequent withdrawal and replacement, for purposes of more consistent finished water treatment and because of the increased risk for contamination that can occur with replacement.

The AMC concept and type of recharge credit that Wichita has proposed is a way for Wichita to accumulate recharge credits while keeping the Aquifer as full as possible. It would work like this: if flows in the Little Arkansas River are high enough, then Wichita would divert and treat excess surface water therefrom. To the extent there is space in the BSA, then Wichita would inject the treated water and generate a traditional (currently authorized) ASR recharge credit, i.e., a physical recharge credit. To the extent there is not space in the BSA, however, then Wichita would route the treated water directly to town for Wichita's immediate municipal needs, and Wichita would get corresponding AMC credits—just a different type of recognized ASR recharge credit. This essentially would enable Wichita to accumulate the same amount of ASR recharge credits but without having to exercise their right under existing ASR project provisions to "pump a hole" in the BSA in order to create the space needed in which to refill it with injected, treated surface water.

Prior to the initiation of formal proceedings in this matter, the Chief Engineer opined in a letter to GMD2 dated June 1, 2018, that AMCs, if allowed to be accumulated under the Proposal, would be deemed an additional form of recharge credit. DWR agrees with this opinion. Accordingly, DWR believes that AMCs would be in compliance with KAR 5-12-1 through 5-12-4, because they would be deemed just a different type of recharge credit, and recharge credits currently are allowed. DWR agrees with the other statements in the aforementioned letter, including the statement that there "may well be additional terms and conditions that will improve the accounting of AMCs or other changes that will better serve the public's interest."

C. Additional DWR Opinions and Recommendations

DWR believes that the proposed modifications in the Proposal, if coupled with appropriate conditions, could be reasonable and in the public's interest because it is in the public's interest for the Aquifer to be full going into a drought. Accordingly, DWR recommends that, if any of the proposed modifications of the Proposal are approved, then at least the following permit conditions should be imposed:

1) conditions that impose a maximum recharge credit (whether physical recharge credits, or AMCs) accumulation amount of 120,000 acre-feet;

2) conditions that adequately ensure that other native rights in the area are protected from any impairment that may result, such as conditions that require Wichita to use pumping rotation and timing if conflicts occur, and that adequately protect current domestic use in the Wellfield;

3) conditions that adequately address the sequence of Wichita's priority pumping, i.e., pumping recharge credits vs. native water rights;

4) conditions that limit the usage of accumulated recharge credits to Wichita's overall authorized quantity; and

5) such other conditions that DWR or the Presiding Officer may deem appropriate to impose because of the information presented or received in the proceedings of this matter.

Based on such additional information that may be learned at the formal-phase hearing for this matter or otherwise, DWR reserves the right to revise or supplement its opinions and recommendations herein, by the post-hearing deadline provided by the Presiding Officer.

Division of Water Resources

By: Lane Letourneau

Lane Letourneau
Program Manager, Appropriation Program
Division of Water Resources

Respectfully submitted by,

Aaron B. Oleen

Aaron B. Oleen, S. Ct. #23588
1320 Research Park Drive
Manhattan, Kansas 66502
TEL: (785) 564-6715
FAX: (785) 564-6777
aaron.oleen@ks.gov
Attorney for KDA-DWR

CERTIFICATE OF SERVICE

I certify that on this 18th day of March, 2019, the above *DWR's Pre-Hearing Brief and Written Testimony* was electronically filed with the Presiding Officer for this matter and that copies were sent via e-mail to the following:

Presiding Officer
1320 Research Park Drive
Manhattan, KS 66502
david.barfield@ks.gov
kenneth.titus@ks.gov

Intervenors
1010 Chestnut
Halstead, KS 67056
twendling@mac.com

Equus Beds Groundwater Management District No. 2
313 Spruce
Halstead, KS 67056
tboese@gmd2.org
tom@aplawpa.com
stucky.dave@gmail.com
leland.rolfs@sbcglobal.net

City of Wichita
Department of Public Works & Utilities
455 North Main Street
Wichita, KS 67202
jpajor@wichita.gov
bmcleod@wichita.gov

Aaron B. Oleen

Aaron B. Oleen, S. Ct. #23588

1320 Research Park Drive
Manhattan, Kansas 66502
(785) 564-6700

Kansas
Department of Agriculture
agriculture.ks.gov

900 SW Jackson, Room 456
Topeka, Kansas 66612
(785) 296-3556

Jackie McClaskey, Secretary

Governor Sam Brownback

September 18, 2017

Joseph Pajor
City of Wichita
Deputy Director
Department of Public Works & Utilities
455 N Main, 8th Floor
Wichita, KS 67202

RE: Wichita ASR project
Process and input on City's technical work

Per my commitments at our August 15, 2017 meeting, I am writing to provide: 1) an outline of the process we will use to consider the City's request for revised permit conditions related to their Aquifer Storage and Recovery (ASR) project and 2) our comments on the City's technical work to establish reasonable bottoms for the Basin Storage Area.

Process for consideration changes to ASR conditions – Below is a summary of what was communicated at our meeting, with additional details in places. Please review and let me know if you have any concerns or see a better path forward than is outlined below.

1. After review, **DWR believes no changes to statute or rules are necessary to consider and implement the City's anticipated request** for changes to ASR conditions. We don't see anything in the rules that prevents two types of recharge credits and separate means of accounting, as long as they can be supported as following *"sound engineering methods based on actual measurements, generally accepted engineering methodology, or a combination of both."* The City's request will need to provide technical support for the requested changes. Attached to this letter are the key provisions from our regulations related to modeling and accounting of ASR projects.

2. **Aquifer Maintenance Credits (AMCs) are not passive recharge credits.** In his order dated August 8, 2005 related to Wichita's ASR project, David Pope specifically concluded it was inappropriate to allow for passive recharge credits. DWR does not believe that AMCs as envisioned are passive recharge credits, the distinction being that the City's proposed AMC recharge credits will pass through the ASR diversion and treatment infrastructure and are subject to the rate and quantity limitations of the permit(s).

3. **Process for considering the pending ASR new applications and revised conditions for existing ASR permits.** After review of statute and regulations, which are not particularly prescriptive on process sequence, we suggest the following steps forward:
    a. The City will work through its process, including continuing its work with DWR and GMD 2 staff, to finalize its request to include specifics for accounting and modeling, revised terms and conditions for the new applications currently on file as well as other ASR permits, with supporting technical work (for more detail, see #4 below). Concurrently, the City will work on its public outreach.
    b. When the City's request and support work is complete, DWR will start its formal consideration by sending the package to GMD 2 for review. We will also post the documents on our web site for the general public.

- Page 4-5, 1% drought simulation.
    - We assume that the 110% assumption for Cheney is based on the reservoir achieving this level in non-drought years. If so, you might state this basis.
    - While we have not examined the question, we assume that 1933-40 streamflows into Cheney were likely greater than 2011-12 due to changes in land use practices and other developments since. If this is the case, your future Cheney yield would be too high, resulting in less use of the EBWF in your subsequent analysis and a higher estimated bottoms. We assume the City is comfortable with this assumption given your 10 foot "factor of safety" provided to the bottom line of your analysis. We suggest you add a bit more narrative to the report to explain why the 1933-40 streamflows are used here whereas repeated 2011-12 streamflows are used elsewhere.
- Page 8, Table 5.
    - See comment above on 1933-40 streamflows vs. 2011-12 above.
    - GMD 2's comments questioned whether repeating the 2011-12 pumping by irrigation and others four times might overestimate pumping in a coming 1% drought, given that KDA-DWR allowed more pumping in the period via its drought-term permits and one-time MYFA "forgiveness," which we do not plan on repeating with the implementation the revised MYFA tool (although who can tell for sure what type of special considerations might be provided in a future 1% drought). How does the pumping for 2011-12 in the analysis compare with two times authorized for the various uses made of water within the modeled area?
- Page 9 – We suggest you reference Figure 3 when referring to the CWSA and BSA and make the terminology between narrative and figure consistent.
- Page 12 – Simulated water level results - While it is helpful to characterize simulated water levels as a percent of full conditions in the CWSA and BSA, we agree with GMD 2 that more refined presentation of the results would be helpful for others to understand the effects to in specific areas and time steps. An examination of the hydrographs in Attachment I showing the modeled results by year and index cell, indicates that minimum levels occurs almost universally in year 8 of the simulation. We suggest a table or graphic similar to Figure 6 show the percent of full in year 8.
- Page 13 – Depiction of proposed levels.
    - Perhaps a figure similar to Figure 9 could be included that has the proposed bottoms of the BSA as a % of pre-development saturated thickness.
    - A map illustrating Figure 10's remaining aquifer thickness might also be helpful.
    - Why are IW1 and IW2 not included?
- Attachment I – Hydrographs. You might consider adding a note on each hydrograph with the elevation of the bottom of the aquifer. You might also seek to clarify in the narrative describing them the significance of the two hydrographs plotted (upper and lower aquifers) and which corresponds with the current bottoms of the BSA.

We look forward to our continued work on these matters. Please let me know if you have any questions.

David W. Barfield

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

cc: Tim Boese, Groundwater Management District No. 2
Brian Meier, Bruns & McDonnell
Lane Letourneau, Kansas Department of Agriculture
Chris Beightel, Kansas Department of Agriculture
Jeff Lanterman, Kansas Department of Agriculture, Stafford Field Office

water entering and leaving the basin storage area shall be determined by using sound engineering methods based on actual measurements, generally accepted engineering methodology, or a combination of both.

And 5-12-2 a and b

(a) In addition to annual water use reporting requirements pursuant to K.S.A. 82a-732, and amendments thereto, on June 1 of each year the permit holder of an aquifer storage or recovery system shall report an accounting of water in the basin storage area to the chief engineer and to any groundwater management district identified in subsection (c) of this regulation. The annual report for the preceding calendar year shall account for all water entering and leaving the basin storage area and shall specifically compute the amount of recharge credits held in the basin storage area.

(b) The report shall be in the form prescribed by the chief engineer and shall address the items in the water balance for the basin storage area, which may include the following amounts:

(1) Natural and artificial recharge;

(2) groundwater inflow and outflow;

(3) evaporation and transpiration;

(4) groundwater water diversions from all nondomestic wells;

(5) infiltration from streams;

(6) groundwater discharge to streams;

(7) the calculated recharge credits; and

(8) any other information that in the opinion of the chief engineer is pertinent to the basin storage and surrounding areas.

The annual accounting shall specifically take into account the amounts of natural recharge, artificial recharge, groundwater inflow, groundwater outflow, evapotranspiration, and groundwater pumpage. Groundwater pumpage shall include recharge credits withdrawn as well as pumpage from all nondomestic wells in the basin storage area. The annual accounting shall include any additional items within a basin storage area that would be necessary to determine the amount of recharge credit available for recovery.

STATE OF KANSAS

DEPARTMENT OF AGRICULTURE
1320 RESEARCH PARK DRIVE
MANHATTAN, KS 66502
PHONE: (785) 564-6700
FAX: (785) 564-6777

900 SW JACKSON, ROOM 456
TOPEKA, KS 66612
PHONE: (785) 296-3556
www.agriculture.ks.gov

GOVERNOR JEFF COLYER, M.D.
JACKIE MCCLASKEY, SECRETARY OF AGRICULTURE

June 1, 2018

Groundwater Management District No. 2
% Tim Boese
313 Spruce St.
Halstead KS 67506-1925

City of Wichita
Director of Public Works & Utilities
City Hall Eighth Floor
455 N Main
Wichita KS 67202-1606

GMD2 Board of Directors,

Thank you once again for the comments from your initial review of City of Wichita's (Wichita) proposed changes to their Aquifer Storage and Recovery ("ASR") program. Although many of your comments and questions were addressed by Wichita's response letter dated May 22, 2018, I am responding specifically to the legal and policy questions that were raised in your comments.

A more detailed response to your specific questions is enclosed with this letter. In general, regarding Aquifer Maintenance Credits ("AMC"), it is the position of myself and the Division of Water Resources that AMCs, as proposed in this project, constitute a potential additional method to accumulate and account for recharge credits under existing authorities. Based on our ASR regulations and the ability to modify Wichita's existing project and accounting system, it is our opinion that, with the inclusion of proper terms and conditions and limitations, an accounting method which creates the functional equivalence of aquifer recharge could be implemented.

As envisioned, AMCs should serve the public interest by facilitating fuller aquifer conditions without allowing the use of new or unappropriated water. This is accomplished by allowing the same source water currently used by Wichita's ASR project to be diverted and treated as if it would be injected into the aquifer, but instead allowing it to be diverted to Wichita, offset by a reduction in pumping from Wichita's Equus Bed water rights. Therefore, as proposed, AMCs appear to be the functional equivalent of existing recharge credits and serve the public interest by maintaining a fuller aquifer instead of requiring Wichita to create additional capacity in the aquifer.

Ultimately, if approved, the proposed changes would result in a change to the accounting system of the existing ASR project and not a new ASR project. AMCs are simply an additional form of recharge credit. Therefore, I have decided not to seek independent legal review of the matter as you suggested in your comments. Wichita's proposal does not create new or broadened authority because they use the same water, under project limitations, that they could currently access.

I do believe that the public process is important in considering these changes. There may well be additional terms and conditions that will improve the accounting of AMCs or other changes that will better serve the public's interest. This is why I am committed to holding an informational

meeting and a public hearing prior to a final consideration of Wichita's proposed project. It is also important to remember that Wichita is not required to operate its project for the benefits of others, however, it is important to find a way to fulfill their rights while also protecting the public interest of other users of the aquifer.

Now that initial comments and responses have been received from GMD2 and Wichita, we are ready to move on to the next phase of consideration of Wichita's proposal. I will be working with Wichita and GMD2 to establish times and locations for an informational meeting during June, a public hearing date in mid-August, and a pre-hearing conference date closely following the informational meeting.

Enclosed you will also find a copy of the revised draft approval documents based on comments from GMD2 and Wichita, both markups and clean copies.

Please let me know if you have any questions in the meantime.

Sincerely,

David W. Barfield

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

Enclosures (7)

CC:

Jeff Lanterman, Kansas Department of Agriculture, Stafford Field Office

Responses to GMD 2 legal/policy questions and comments

What is an Aquifer Maintenance Credit and how can an AMC be accumulated and appropriated for beneficial use under the current Water Appropriation Act and rules and regulations?

Aquifer Maintenance Credits are proposed to be recharge credits granted to the City of Wichita pursuant to Phase II of its ASR Project. Little Arkansas River source water will be diverted at the City's ASR facility, treated, and sent to the City to the extent that full aquifer conditions make recharge impractical. This action will then be offset by a reduction in the City's pumping of its native Equus Beds water rights. These actions, with appropriate limitations and terms and conditions, this creates a functionally equivalent accounting system and prevents unnecessarily lowering the Equus Beds Aquifer by pumping native rights to create additional capacity for physical recharge.

The City currently has the authority and ability to develop the recharge credits it now seeks. However, under the current ASR project terms and conditions, this would first require the City to reduce water levels in the aquifer to make room for additional credits. The City, via its demand and native water rights, has the ability to do this over time, and without causing impairment to others. The City is seeking a way to develop recharge credits for water diverted and treated under its Phase II ASR rights without the need to unnecessarily draw the aquifer down.

The City's current ASR project has been approved pursuant to KAR 5-12-1 et seq., with appropriate terms and conditions to protect the public interest and prevent impairment. The ASR approval documents include provision for making changes to the ASR accounting procedure. Since the proposed changes are not new water, simply another way to accrue recharge credits, these changes would be made pursuant to existing authority.

As the City's current proposal appears to provide a functionally equivalent method to accumulate and account for recharge credits in a manner that better serves the public interest, we believe it can be considered under these authorities. The hearing process will confirm these matters and determine if the proposed terms and conditions are sufficient.

Is an AMC a source water? How does an AMC "artificially replenish the water supply of the aquifer"?

The source water for these credits is the Little Arkansas River pursuant to Water Right File No. 46,627. Water diverted under this water right from the Little Arkansas River meets the definition of source water when it is used for artificial recharge. Artificial recharge means the use of source water to artificially replenish the water supply in an aquifer. However, there is no definition provided for artificial replenishment. First, it is important to note that AMCs would only be available to the City within the authorization of its current ASR approvals and where, but for high aquifer conditions, it could have recharged such source water. AMCs will allow be allowed to the extent the City physically diverts and treats Little Arkansas River source water for use in the City and offsetting use from its native Equus Beds water rights. This makes it unnecessary to lower of the water level in the aquifer, thereby the public interest better protected. At the same, the City does not gain access to any water they currently would not have access to. Conditions and limitations can be used to further protect other users of the aquifer. Therefore, AMCs simply allow the functional equivalent of an action that can physically occur.

How is an AMC stored in the aquifer by artificial recharge?

It is stored in the aquifer as the functional equivalent of a physical replacement of water, as expressed above.

Where is the "put" with an AMC? How can a new appropriation of water be established in an over-appropriated area if there is no additional water added to the system? Can water not pumped under an existing water right be appropriated again under a new water permit?

Additional water, under existing water rights and the existing ASR project, is being added to the system via diversion and treatment of Little Arkansas River surface water. AMCs are treated ASR water supplying the City with water that would otherwise be withdrawn from its native Equus Bed rights.

No new appropriation is being proposed, rather an additional method to accumulate and account for recharge credits when aquifer conditions are full is proposed.

Water Permit No. 46,627 does not authorize AMCs as a beneficial use, as AMCs are not Artificial Recharge or Municipal use.

As noted above, if approved, AMCs would be recharge credits allowed under the specified circumstances, limitations, and terms and conditions proposed.

Kansas water law does not currently have a provision for [exchanges of surface water for ground use deferred]. In current Kansas water law, Water Banking is the only similar concept that allows unused water to be allocated in an over-appropriated area. Multi-Year Flex Accounts (MYFAs) is another less similar tool. Both water banking and MYFAs were authorized by State law and use term permits, not water appropriation permits and water rights.

We believe with appropriate terms and conditions, we can consider AMC's an additional means of accumulating and accounting for recharge credits pursuant to our existing regulations and the existing ASR authorization based on its functional equivalence and the improved operations with respect to facilitating keeping the aquifer near full.

Draft, June 1, 2018
Example Proposed F &O amending terms & conditions of an existing ASR Phase II permit

FINDINGS AND ORDER
IN THE MATTER OF
PERMIT CONDITIONS UNDER
APPROPRIATION OF WATER, FILE NO. 46,714

After due consideration, the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture (hereinafter referred to as the "Chief Engineer"), makes the following findings and order:

FINDINGS

1. That on September 18, 2009, the Chief Engineer approved Appropriation of Water, File No. 46,714, for permit to appropriate groundwater recharge credits accumulated in the Equus Beds aquifer for municipal use, authorizing the applicant, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use.

2. That per Paragraph No. 19 of the Approval of Application and Notice to Proceed for Appropriation of Water, File No. 46,714, the permit was issued with the condition that "the proposed recovery of water artificially recharged by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is above elevation 1,387 mean sea level (msl)." This elevation was based on what was considered to be the lowest aquifer water level for this cell as determined by January 1993 water level measurements (i.e. the bottom of the Basin Storage Area).

3. That on May 6, 2015, the Chief Engineer approved a Findings and Order, which defined "static water level" as the water level measured early in the calendar year (normally in January) prior to the irrigation season, and after allowing time for natural aquifer recovery. In addition, the Order modified the minimum index level (groundwater elevation) for Cell No. 6 to be 1,388.74 feet mean sea level.

4. That the City has conducted extensive modeling and data analysis to indicate that during a prolonged drought, groundwater elevations would drop below the current minimum index levels. This would prevent the City from withdrawing recharge credits when they are most needed.

5. That the City has proposed alternative minimum index levels, which on average are approximately 12.8 feet lower than current levels. Even at these levels, the aquifer will remain 80 percent full on average across the well field.

6. That based on this data and analysis, it is proposed that the minimum index level elevation for Cell No. 6 should be modified to 1,370.0 mean sea level.

7. That this modification in the minimum index level elevation will not prejudicially or unreasonably affect the public interest, and no senior rights will be impaired.

8. That per Paragraph No. 7 of the Approval of Application and Notice to Proceed for Appropriation of Water, File No. 46,714, the permit was issued with the condition that "the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, and any subsequent modifications, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof."

9. That this approval was prior to the concept and approval of Aquifer Maintenance Credits (AMCs), which can be accumulated in the Equus Beds Wellfield.

10. That Paragraph No. 7 should be modified to allow for the recovery of AMCs as follows: "That the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, any subsequent modifications, and any Aquifer Maintenance Credits, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof."

11. That Paragraph No. 19 should be modified to "the proposed recovery of water by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is at or above elevation 1,370.0 mean sea level (msl)."

12. That in order to protect existing domestic well owners, located within 660 feet of an existing or new ASR well, the City has agreed that if the water quality in an existing domestic well meets the current drinking water standards and the water quality is subsequently changed by the ASR project such that the water no longer meets the 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.

13. That in order to protect nearby, existing domestic well owners, the City has agreed that if a domestic water well, existing before the filing of this application for permit and within 660 feet of an existing or new ASR 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.

ORDER

NOW, THEREFORE, It is the decision and order of the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture, that effective the date of this order, Appropriation of Water, File No. 46,714 is conditioned as follows:

Paragraph No. 7 should read as follows: "That the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, any subsequent modifications, and any Aquifer Maintenance Credits, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof."

Paragraph No. 19 should read as follows: "That the proposed recovery of water by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is at or above elevation 1,370.0 mean sea level (msl)."

That if water quality in an existing domestic well, within 660 feet of an existing or new ASR well, meets the current drinking water standards and the water quality is subsequently changed by the ASR project such that the water no longer meets the 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.

That if a domestic water well, existing before the filing of this application for permit and within 660 feet of an existing or new ASR 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.

In all other respects, the approval of Appropriation of Water, File No. 46,714, for permit to appropriate water for beneficial use, is as stated and set forth in the Approval of Application and Permit to Proceed dated September 18, 2009, and subject to the terms, conditions, and limitations of the Order approving the City of Wichita's Aquifer Storage and Recovery Project - Phase II project, dated _____ 2018.

This is a final agency action. If you choose to appeal this decision or any finding or part thereof, you must do so by filing a petition for review in the manner prescribed by the Kansas Act for Judicial Review and Civil Enforcement of Agency Actions (KJRA K.S.A. 77-601 et seq.) within 30 days of service of this order. Your appeal must be made with the appropriate district court for the district of Kansas. The Chief Legal Counsel for the Kansas Department of Agriculture, 1320 Research Park Drive, Manhattan, Kansas 66502, is the agency officer who will receive service of a petition for judicial review on behalf of the Kansas Department of Agriculture, Division of Water Resources. If you have questions or would like clarification concerning this order, you may contact the Chief Engineer.

Ordered this day of , 2018, in Topeka, Shawnee County, Kansas.

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

Draft ~~for initial review, March 22~~, June 1, 2018
Example Proposed F &O amending terms & conditions of an existing ASR Phase II permit

FINDINGS AND ORDER
IN THE MATTER OF
PERMIT CONDITIONS UNDER
APPROPRIATION OF WATER, FILE NO. 46,714

After due consideration, the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture (hereinafter referred to as the "Chief Engineer"), makes the following findings and order:

FINDINGS

1. That on September 18, 2009, the Chief Engineer approved Appropriation of Water, File No. 46,714, for permit to appropriate groundwater recharge credits accumulated in the Equus Beds aquifer for municipal use, authorizing the applicant, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use.

2. That per Paragraph No. 19 of the Approval of Application and Notice to Proceed for Appropriation of Water, File No. 46,714, the permit was issued with the condition that "the proposed recovery of water artificially recharged by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is above elevation 1,387 mean sea level (msl)." This elevation was based on what was considered to be the lowest aquifer water level for this cell as determined by January 1993 water level measurements (i.e. the bottom of the Basin Storage Area).

3. That on May 6, 2015, the Chief Engineer approved a Findings and Order, which defined "static water level" as the water level measured early in the calendar year (normally in January) prior to the irrigation season, and after allowing time for natural aquifer recovery. In addition, the Order modified the minimum index level (groundwater elevation) for Cell No. 6 to be 1,388.74 feet mean sea level.

4. That the City has conducted extensive modeling and data analysis to indicate that during a prolonged drought, groundwater elevations would drop below the current minimum index levels. This would prevent the City from withdrawing recharge credits when they are most needed.

5. That the City has proposed alternative minimum index levels, which on average are approximately 12.8 feet lower than current levels. Even at these levels, the aquifer will remain 80 percent full on average across the well field.

6. That based on this data and analysis, it is proposed that the minimum index level elevation for Cell No. 6 should be modified to 1,370.0 mean sea level.

7. That this modification in the minimum index level elevation will not prejudicially or unreasonably affect the public interest, and no senior rights will be impaired.

8. That per Paragraph No. 7 of the Approval of Application and Notice to Proceed for Appropriation of Water, File No. 46,714, the permit was issued with the condition that "the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, and any subsequent modifications, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof."

9. That this approval was prior to the concept and approval of Aquifer Maintenance Credits (AMCs), which can be accumulated in the Equus Beds Wellfield.

10. That Paragraph No. 7 should be modified to allow for the recovery of AMCs as follows: "That the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, any subsequent modifications, and any Aquifer Maintenance Credits, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof."

11. That Paragraph No. 19 should be modified to "the proposed recovery of water by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is at or above elevation 1,370.0 mean sea level (msl)."

12. That in order to protect ~~nearby,~~ existing domestic well owners, located within 660 feet of an existing or new ASR well, the City has agreed that if the water quality in an existing domestic well meets the current drinking water standards and the water quality is subsequently changed by the ASR project such that the water no longer meets the 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.

13. That in order to protect nearby, existing domestic well owners, the City has agreed that if a domestic water well, existing before the filing of this application for permit and within 660 feet of an existing or new ASR 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.

ORDER

NOW, THEREFORE, It is the decision and order of the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture, that effective the date of this order, Appropriation of Water, File No. 46,714 is conditioned as follows:

Paragraph No. 7 should read as follows: "That the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, any subsequent modifications, and any Aquifer Maintenance Credits, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof."

Paragraph No. 19 should read as follows: "That the proposed recovery of water by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is at or above elevation 1,370.0 mean sea level (msl)."

That if water quality in ~~a nearby,~~an existing domestic well, within 660 feet of an existing or new ASR well, meets the current drinking water standards and the water quality is subsequently changed by the ASR project such that the water no longer meets the 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.

That if a domestic water well, existing before the filing of this application for permit and within 660 feet of an existing or new ASR 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.

In all other respects, the approval of Appropriation of Water, File No. 46,714, for permit to appropriate water for beneficial use, is as stated and set forth in the Approval of Application and Permit to Proceed dated September 18, 2009, and subject to the terms, conditions, and limitations of the Order approving the City of Wichita's Aquifer Storage and Recovery Project - Phase II project, dated _____ 2018.

This is a final agency action. If you choose to appeal this decision or any finding or part thereof, you must do so by filing a petition for review in the manner prescribed by the Kansas Act for Judicial Review and Civil Enforcement of Agency Actions (KJRA K.S.A. 77-601 et seq.) within 30 days of service of this order. Your appeal must be made with the appropriate district court for the district of Kansas. The Chief Legal Counsel for the Kansas Department of Agriculture, 1320 Research Park Drive, Manhattan, Kansas 66502, is the agency officer who will receive service of a petition for judicial review on behalf of the Kansas Department of Agriculture, Division of Water Resources. If you have questions or would like clarification concerning this order, you may contact the Chief Engineer.

Ordered this day of , 2018, in Topeka, Shawnee County, Kansas.

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

Draft, June 1, 2018
Example proposed individual approval for one of the new applications

APPROVAL OF APPLICATION
and
PERMIT TO PROCEED

(This Is Not a Certificate of Appropriation)

This is to certify that I have examined Application, **File No. 48,704** of the applicant

CITY OF WICHITA
PUBLIC WORKS & UTILITIES-WTP
455 N MAIN ST 8TH FLOOR
WICHITA KS 67202

for a permit to appropriate water for beneficial use, together with the maps, plans and other submitted data, and that the application is hereby approved and the applicant is hereby authorized, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works (except those dams and stream obstructions regulated by K.S.A. 82a-301 through 305a, as amended), and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use and otherwise perfect the proposed appropriation subject to the following terms, conditions and limitations:

1. That the priority date assigned to such application is **July 23, 2013.**

2. That the water sought to be appropriated shall be used for municipal use within the City of Wichita and immediate vicinity; within the City of Andover and immediate vicinity, within the City of Bel Aire and immediate vicinity, within the City of Benton and immediate vicinity, within the City of Derby and immediate vicinity; within the City of Kechi and immediate vicinity; within the City of Park City and immediate vicinity; within the City of Rose Hill and immediate vicinity; within the City of Valley Center and immediate vicinity; within the City of Bentley and immediate vicinity, within the boundaries of Rural Water District No. 1, Sedgwick County; within the boundaries of Rural Water District No. 2, Sedgwick County; within the boundaries of Rural Water District No. 3, Sedgwick County; and within the boundaries of Rural Water District No. 8, Butler County; within a tract of land in Sedgwick County, Kansas, beginning at the Southeast corner of Section 25, Township 28 South, Range 2 East, then West a distance of 22 miles to the Southwest corner of Section 28, Township 28 South, Range 2 West, then North a distance of 16 miles to the Northwest corner of Section 9, Township 26 South, Range 2 West, then East a distance of 22 miles to the Northeast corner of Section 12, Township 26 South, Range 2 East, then directly South a distance of 16 miles to the point of beginning.

3. That the authorized source from which the appropriation shall be made is groundwater recharge credits accumulated in the Equus Beds aquifer, that may be recovered pursuant to the operation of the approved aquifer storage and recovery project, and any subsequent modifications, to be withdrawn by means of one (1) well located in the Northwest Quarter of the Northwest Quarter of the Northwest Quarter (NW¼ NW¼ NW¼) of Section 29, more particularly described as being near a point 5,060 feet North and 5,100 feet West of the Southeast corner of said section, in Township 23

South, Range 2 West, Harvey County, Kansas, located substantially as shown on the topographic map accompanying the application.

4. That the appropriation sought shall be limited to a maximum diversion rate not in excess of **1,500 gallons per minute** (3.34 c.f.s.) and to a quantity not to exceed **162.93 million gallons** (500.0 acre-feet) of water for any calendar year.

5. That installation of works for diversion of water shall be completed on or before **December 31, 2019** or within any authorized extension thereof. The applicant shall notify the Chief Engineer and pay the statutorily required field inspection fee of $400.00 when construction of the works has been completed. Failure to timely submit the notice and the fee will result in revocation of the permit. Any request for an extension of time shall be submitted prior to the expiration of the deadline and shall be accompanied by the required statutory fee of $100.00.

6. That the proposed appropriation shall be perfected by the actual application of water to the proposed beneficial use on or before **December 31, 2038** or any authorized extension thereof. Any request for an extension of time shall be submitted prior to the expiration of the deadline and shall be accompanied by the required statutory fee of $100.00.

7. That the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, any subsequent modifications, and any accumulated Aquifer Maintenance Credits, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof.

8. That the use of water herein authorized shall not be made so as to impair any use under existing water rights nor prejudicially and unreasonably affect the public interest.

9. That the right of the appropriator shall relate to a specific quantity of water and such right must allow for a reasonable raising or lowering of the static water level and for the reasonable increase or decrease of the streamflow at the appropriator's point of diversion.

10. That this permit does not constitute authority under K.S.A. 82a-301 through 305a to construct any dam or other obstruction; nor does it grant any right-of-way, or authorize entry upon or injury to, public or private property.

11. That all diversion works constructed under the authority of this permit into which any type of chemical or other foreign substance will be injected into the water pumped from the diversion works shall be equipped with an in-line, automatic quick-closing, check valve capable of preventing pollution of the source of the water supply. The type of valve installed shall meet specifications adopted by the Chief Engineer and shall be maintained in an operating condition satisfactory to the Chief Engineer.

12. That an acceptable water flow meter shall be installed and maintained on the diversion works authorized by this permit in accordance with Kansas Administrative Regulations 5-1-4 through 5-1-12 adopted by the Chief Engineer. This water flow meter shall be used to provide an accurate quantity of water diverted as required for the annual water use report (including the meter reading at the beginning and end of the report year).

13. That the applicant shall maintain accurate and complete records from which the quantity of water diverted during each calendar year may be readily determined and the applicant shall file an annual water use report with the Chief Engineer by March 1 following the end of each calendar year. Failure to file the annual water use report by the due date shall cause the applicant to be subject to a civil penalty.

14. That no water user shall engage in nor allow the waste of any water diverted under the authority of this permit.

15. That failure without cause to comply with provisions of the permit and its terms, conditions and limitations will result in the forfeiture of the priority date, revocation of the permit and dismissal of the application.

16. That the right to appropriate water under authority of this permit is subject to any minimum desirable streamflow requirements identified and established pursuant to K.S.A. 82a-703c for the source of supply to which this water right applies.

17. That the proposed recovery of water by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is above elevation 1,370 mean sea level (msl).

18. That static water level is defined as the water level measured early in the calendar year prior to the irrigation season, and after allowing time for natural aquifer recovery.

19. That operation of the aquifer storage and recovery well authorized herein, shall not impair existing water rights nor prejudicially and unreasonably affect the public interest.

20. That if the Chief Engineer determines that impairment of an existing prior water right is caused by operation of the aquifer storage and recovery well, the City of Wichita shall either regulate the aquifer storage and recovery well's diversion to secure water to satisfy all prior rights, or comply with any other requirement as specified by the Chief Engineer to prevent impairment or protect the public interest.

21. That the recharge system is constructed, operated, and monitored to prevent groundwater contamination, not impair existing water rights, nor prejudicially affect the public interest.

22. That if water quality in an existing domestic well, within 660 feet of an existing or new ASR well, meets the current drinking water standards and the water quality is subsequently changed by the ASR project such that the water no longer meets the 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.

23. That if a domestic water well, existing before the filing of this application for permit and within 660 feet of an existing or new ASR 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.

That this approval of application is subject to the terms, conditions, and limitations of the Order approving the City of Wichita's Aquifer Storage and Recovery Project - Phase II project, dated_____ 2018.

Ordered this day of , 2018, in Topeka, Shawnee County, Kansas.

_____

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

Draft ~~for initial review, March 22~~, June 1, 2018
Example proposed individual approval for one of the new applications

APPROVAL OF APPLICATION
and
PERMIT TO PROCEED

(This Is Not a Certificate of Appropriation)

This is to certify that I have examined Application, **File No. 48,704** of the applicant

CITY OF WICHITA
PUBLIC WORKS & UTILITIES-WTP
455 N MAIN ST 8TH FLOOR
WICHITA KS 67202

for a permit to appropriate water for beneficial use, together with the maps, plans and other submitted data, and that the application is hereby approved and the applicant is hereby authorized, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works (except those dams and stream obstructions regulated by K.S.A. 82a-301 through 305a, as amended), and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use and otherwise perfect the proposed appropriation subject to the following terms, conditions and limitations:

1. That the priority date assigned to such application is **July 23, 2013.**

2. That the water sought to be appropriated shall be used for municipal use within the City of Wichita and immediate vicinity; within the City of Andover and immediate vicinity, within the City of Bel Aire and immediate vicinity, within the City of Benton and immediate vicinity, within the City of Derby and immediate vicinity; within the City of Kechi and immediate vicinity; within the City of Park City and immediate vicinity; within the City of Rose Hill and immediate vicinity; within the City of Valley Center and immediate vicinity; within the City of Bentley and immediate vicinity, within the boundaries of Rural Water District No. 1, Sedgwick County; within the boundaries of Rural Water District No. 2, Sedgwick County; within the boundaries of Rural Water District No. 3, Sedgwick County; and within the boundaries of Rural Water District No. 8, Butler County; within a tract of land in Sedgwick County, Kansas, beginning at the Southeast corner of Section 25, Township 28 South, Range 2 East, then West a distance of 22 miles to the Southwest corner of Section 28, Township 28 South, Range 2 West, then North a distance of 16 miles to the Northwest corner of Section 9, Township 26 South, Range 2 West, then East a distance of 22 miles to the Northeast corner of Section 12, Township 26 South, Range 2 East, then directly South a distance of 16 miles to the point of beginning.

3. That the authorized source from which the appropriation shall be made is groundwater recharge credits accumulated in the Equus Beds aquifer, that may be recovered pursuant to the operation of the approved aquifer storage and recovery project, and any subsequent modifications, to be withdrawn by means of one (1) well located in the Northwest Quarter of the Northwest Quarter of the Northwest Quarter (NW¼ NW¼ NW¼) of Section 29, more particularly described as being near a point 5,060 feet North and 5,100 feet West of the Southeast corner of said section, in Township 23

South, Range 2 West, Harvey County, Kansas, located substantially as shown on the topographic map accompanying the application.

4. That the appropriation sought shall be limited to a maximum diversion rate not in excess of **1,500 gallons per minute** (3.34 c.f.s.) and to a quantity not to exceed **162.93 million gallons** (500.0 acre-feet) of water for any calendar year.

5. That installation of works for diversion of water shall be completed on or before **December 31, 2019** or within any authorized extension thereof. The applicant shall notify the Chief Engineer and pay the statutorily required field inspection fee of $400.00 when construction of the works has been completed. Failure to timely submit the notice and the fee will result in revocation of the permit. Any request for an extension of time shall be submitted prior to the expiration of the deadline and shall be accompanied by the required statutory fee of $100.00.

6. That the proposed appropriation shall be perfected by the actual application of water to the proposed beneficial use on or before **December 31, 2038** or any authorized extension thereof. Any request for an extension of time shall be submitted prior to the expiration of the deadline and shall be accompanied by the required statutory fee of $100.00.

7. That the applicant shall not be deemed to have acquired a water appropriation for groundwater from the Equus Beds aquifer, except for recovery of water recharged pursuant to the approved aquifer storage and recovery project, any subsequent modifications, and any accumulated Aquifer Maintenance Credits, in excess of the amount approved herein nor in excess of the amount found by the Chief Engineer to have been actually used for the approved purpose during one calendar year subsequent to approval of the application and within the time specified for perfection or any authorized extension thereof.

8. That the use of water herein authorized shall not be made so as to impair any use under existing water rights nor prejudicially and unreasonably affect the public interest.

9. That the right of the appropriator shall relate to a specific quantity of water and such right must allow for a reasonable raising or lowering of the static water level and for the reasonable increase or decrease of the streamflow at the appropriator's point of diversion.

10. That this permit does not constitute authority under K.S.A. 82a-301 through 305a to construct any dam or other obstruction; nor does it grant any right-of-way, or authorize entry upon or injury to, public or private property.

11. That all diversion works constructed under the authority of this permit into which any type of chemical or other foreign substance will be injected into the water pumped from the diversion works shall be equipped with an in-line, automatic quick-closing, check valve capable of preventing pollution of the source of the water supply. The type of valve installed shall meet specifications adopted by the Chief Engineer and shall be maintained in an operating condition satisfactory to the Chief Engineer.

12. That an acceptable water flow meter shall be installed and maintained on the diversion works authorized by this permit in accordance with Kansas Administrative Regulations 5-1-4 through 5-1-12 adopted by the Chief Engineer. This water flow meter shall be used to provide an accurate quantity of water diverted as required for the annual water use report (including the meter reading at the beginning and end of the report year).

13. That the applicant shall maintain accurate and complete records from which the quantity of water diverted during each calendar year may be readily determined and the applicant shall file an annual water use report with the Chief Engineer by March 1 following the end of each calendar year. Failure to file the annual water use report by the due date shall cause the applicant to be subject to a civil penalty.

14. That no water user shall engage in nor allow the waste of any water diverted under the authority of this permit.

15. That failure without cause to comply with provisions of the permit and its terms, conditions and limitations will result in the forfeiture of the priority date, revocation of the permit and dismissal of the application.

16. That the right to appropriate water under authority of this permit is subject to any minimum desirable streamflow requirements identified and established pursuant to K.S.A. 82a-703c for the source of supply to which this water right applies.

17. That the proposed recovery of water by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is above elevation 1,370 mean sea level (msl).

18. That static water level is defined as the water level measured early in the calendar year prior to the irrigation season, and after allowing time for natural aquifer recovery.

19. That operation of the aquifer storage and recovery well authorized herein, shall not impair existing water rights nor prejudicially and unreasonably affect the public interest.

20. That if the Chief Engineer determines that impairment of an existing prior water right is caused by operation of the aquifer storage and recovery well, the City of Wichita shall either regulate the aquifer storage and recovery well's diversion to secure water to satisfy all prior rights, or comply with any other requirement as specified by the Chief Engineer to prevent impairment or protect the public interest.

21. That the recharge system is constructed, operated, and monitored to prevent groundwater contamination, not impair existing water rights, nor prejudicially affect the public interest.

22. That if water quality in ~~a nearby,~~an existing domestic well, within 660 feet of an existing or new ASR well, meets the current drinking water standards and the water quality is subsequently changed by the ASR project such that the water no longer meets the 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.

23. That if a domestic water well, existing before the filing of this application for permit and within 660 feet of an existing or new ASR 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.

That this approval of application is subject to the terms, conditions, and limitations of the Order approving the City of Wichita's Aquifer Storage and Recovery Project - Phase II project, dated_____ 2018.

Ordered this day of , 2018, in Topeka, Shawnee County, Kansas.

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

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
Jackie McClaskey, Secretary of Agriculture

DIVISION OF WATER RESOURCES
David W. Barfield, Chief Engineer

Draft June 1, 2018
Proposed Replacement F &O for ASR Phase II

Findings and Order
In the Matter of the City of Wichita's Phase II Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas

Findings

1. That in a Findings, Conclusion and Order dated August 8, 2005, on file in the office of the Chief Engineer, In the Matter of the City of Wichita's Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas ("Original Order"), the Chief Engineer approved Appropriation of Water, File Nos. 45,567; 45,568; 45,569; 45,570; 45,571; 45,572; 45,573; 45,574; 45,575; 45,576; and 46,081 proposing the appropriation of water for beneficial use.

2. That the Order had 24 Conditions including but not limited to designation of the basin storage area and index cells for the project area, locations of the index wells, approved model and accounting methodology, and reporting requirements.

3. That in a Findings and Order dated August 1, 2006, ("Modified Order"), the Chief Engineer modified the Original Order approving Appropriation of Water, File Nos. 45,567, 45,568, 45,569, 45,570, 45,571, 45,572, 45,573, 45,574, 45,575, 45,576, and 46,081, specifically permit Condition Nos. 9, 12, 14, 17, 20, and 23, pertinent to bank storage wells.

4. That on September 18, 2009, the Chief Engineer issued a Findings and Order approving Appropriation of Water, File Nos. 46,627; 46,714; 46,715; 46,716; 46,717; 46,718; 46,719; 46,720; 46,721; 46,722; 46,723; 46,724; 46,725; 46,726; 46,727; 46,728; 46,729; 46,730; 46,731; 46,732; 46,733; 47,178; 47,179; 47,180; and 47,181.

5. That in a Findings and Order dated December 21, 2009, the Chief Engineer modified the original Order and Modified Order, to be referred to as the "City of Wichita's Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas", without referencing specific file numbers in the title of the Orders; and Condition No. 23 of the Modified Order was revised to allow the project review to extend through 2010.

6. That on September 28, 2010, the Chief Engineer issued a Findings and Order approving Appropriation of Water, File Nos. 47,440; 47,448; 47,449; 47,450; 47,451; 47,452; and 47,453, proposing the appropriation of groundwater (recharge credits) for municipal use.

7. That on July 23, 2013, the City of Wichita (City) filed Applications, File Nos. 48,704; 48,705; 48,706; 48,707; 48,708; 48,709; 48,710; 48,711; 48,712; 48,713; 48,714; 48,715; 48,716; 48,717; 48,718;

48,719; 48,720; 48,721; 48,722; 48,723; 48,724; 48,725; 48,726; 48,727; 48,728; 48,729; 48,730; 48,731; 48,732; and 48,733, proposing the appropriation of groundwater (recharge credits) for municipal use.

8. That these new applications represent merely a continuance of Phase II of the Aquifer Storage and Recovery (ASR) project, wherein surface water will be diverted from the Little Arkansas River by means of a surface water intake (authorized under Appropriation of Water, File No. 46,627), treated, and injected into the Equus Beds Aquifer, to be later withdrawn by means of the same aquifer storage and recovery wells for municipal purposes.

9. That aquifer storage and recovery means the artificial recharge, storage and recovery of water and consists of apparatus for diversion, treatment, recharge, storage, extraction and distribution of water.

10. That the City and Equus Beds Groundwater Management District No. 2 (GMD #2) entered into a Memorandum of Understanding (M.O.U.), dated December 3, 2008, documenting the agreements made between the City and GMD #2, as to the proposed permitting, construction, and operation of Phase II of the aquifer storage and recovery project, a copy of which was subsequently received in the office of the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture (DWR) on January 20, 2009.

11. That as referenced by GMD #2 in their recommendation of approval, and to maintain consistency with the Phase I ASR project, the new applications shall be subject to the pertinent conditions established in the "Original Order", and as modified by the August 1, 2006 ("Modified Order"), more specifically identified as follows:

    A. That passive recharge credits shall not be allowed.

    B. That the basin storage area and index cells for the project are as set forth in Attachment 2 to the Original Order.

    C. That the locations of the index wells and the index water levels for the basin storage area shall be as set forth in Attachments 3 and 4 to the Original Order.

    D. That the Model and accounting methodology remains as previously submitted, until otherwise modified by formal written approval of the Chief Engineer.

    E. That if the City develops an improved model or methodology to account for water stored in the basin storage area that is approved by the Chief Engineer after consideration of the recommendation by GMD #2, that the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

    F. That the project shall be operated so that the measured water levels, and the water levels predicted by the Model, stay at or below the highest index water level any time water is being recharged into the basin storage area.

    G. That water shall only be injected into the basin storage area by means of the injection wells when the water level at any required monitoring well located within 660 feet of an injection well is 10 feet or more below the land surface elevation at those observation wells; that recharge credits may be withdrawn from a cell only when recharge credits are available from

the cell and the static water level at its index well is above the lowest index level; however, water may be recharged when the static water level is below the lowest index level in that well.

H. That the City by June 1 each year shall report an accounting of water diverted from the surface water intake and recharged into the basin storage area in the Equus Beds Aquifer; that the Report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the Model and the accounting methodology described herein.

In addition, the accounting reports shall meet the requirements of K.A.R. 5-12-2, including specifically addressing the following items for each cell in the basin storage area:

- Natural and artificial recharge;
- Groundwater inflow and outflow;
- Evaporation and transpiration;
- Groundwater water diversions from all nondomestic wells;
- Infiltration from streams;
- Groundwater discharge to streams; and
- The calculated recharge credits.

That the final determination of available recharge credits in each cell in the basin storage area shall be made by the Chief Engineer, upon consideration of the report required in Paragraph H, above, and any recommendation by GMD #2. The Chief Engineer shall make the final determination in writing.

I. That each ASR well shall be equipped with water flowmeters, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water injected into and diverted by each well.

J. That the source water used for artificial recharge shall not degrade the ambient groundwater quality use in the basin storage area, and shall comply with source water definition in K.A.R, 5-1-1; that the monitoring well network shown in Attachment 1 of this order is hereby approved; that the monitoring wells shall be drilled and completed at depths correlating to the recharge and recovery zone of the aquifer for the ASR wells for water sample collection, water level measurements and testing purposes; that the water level monitoring at any ASR well site shall be automated with a frequency not to exceed six hours; that before installation of any ASR well, the City shall submit a plan that includes water level monitoring as well as water quality monitoring to establish baseline ambient groundwater quality, which is sufficient to prevent impairment of the water quality beyond a reasonable economic limit, to GMD #2 for review and comment and the Chief Engineer for approval; that the plan should also be consistent with any requirement which Kansas Department of Health and Environment may impose for any UIC permits KDHE may issue pertaining to the ASR wells.

K. That surface water intake quantities, aquifer injection quantities and water level data shall be reported by the City to the Chief Engineer and GMD #2 as follows:

- Each month for the first year of operation;
- Each calendar quarter for the second year of operation;
- By March 1 each year thereafter; or

- Other intervals as may be required by the Chief Engineer to properly evaluate the project.

L. That on or before June 1, of each calendar year, the City shall submit to the Chief Engineer and GMD #2, an annual accounting report for water in the basin storage area, utilizing the Model; that shall meet the requirements of K.A.R. 5-12-2.

M. That the City of Wichita shall simultaneously submit to the Chief Engineer and GMD #2 a formal report containing a description and scaled map of the as-built aquifer storage and recovery project.

12. That the GMD #2 Board of Directors have reviewed each of the new applications listed above and recommended them for approval, subject to specific conditions. [Must get GMD 2 review].

13. That use of the proposed ASR wells be authorized by the Kansas Department of Health and Environment (KDHE) as Class V Underground Injection Control (UIC) wells and that minimum water quality standards for effluent be approved by KDHE for organic and inorganic compounds, pesticides and bacteria; that the water recharged into the aquifer through the ASR wells comply with the source water definition in K.A.R. 5-1-1.

14. That GMD #2 recommends in order to establish baseline ambient groundwater quality prior to recharge, water quality analyses shall be completed at the applicant's expense for samples collected from: a) domestic wells for which access can be obtained located within and immediately adjacent to each index cell in which recharge will occur, b) the proposed ASR wells, and c) all monitoring wells located in the index cells in which recharge will occur.

15. That there have been two previous public hearings concerning the ASR project, with the most recent held on April 29, 2009. The proposed wells described in these pending applications were depicted on a site map distributed to all who attended the meeting. In addition, there have been many other discussions and meetings with area landowners and well owners. [Modify after next hearing]

16. That the proposed applications represent only a continuance of the ASR Phase II project and the applications will be subject to the same permit conditions and limitations established for the previous files, and as modified herein.

17. That the City has conducted extensive modeling and data analysis to indicate that during a prolonged drought, groundwater elevations would drop below the current minimum index levels in some Index Cells. This would prevent the City from withdrawing some recharge credits when they are most needed.

18. That the City has proposed alternative minimum index levels, which on average are approximately 12.8 feet lower than current levels. Even at these levels, the aquifer will remain 80 percent full on average across the well field.

19. That based on this data and analysis, it is proposed that the minimum index level elevations be modified as shown in Table 1, in Attachment 31.

20. That this modification in minimum index level elevations will not prejudicially or unreasonably affect the public interest, and no senior rights will be impaired.

21. That the City of Wichita currently has multiple appropriations of water related to their Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas. The ASR project diverts surface water from the Little Arkansas River by means of a surface water intake (authorized under Appropriation of Water, File No. 46,627). The surface water is treated and injected into the Equus Beds Aquifer, to be later withdrawn by means of the same aquifer storage and recovery wells for municipal purposes.

22. That currently the City can only accumulate recharge credits by physically recharging treated groundwater into the aquifer. At lowered water levels, that facilitate physical recharge, the existing ASR system is capable of recharging 34.5 million gallons per day. Physical recharging of the aquifer is severely limited during periods of elevated groundwater levels. The Equus Beds Wellfield has recovered to nearly pre-development conditions in large part due to the City's reduced use from their Equus Beds Wellfield and increased use from Cheney Reservoir (USGS Scientific Investigations Report 2015-5042).

23. That physical recharge activities will continue to occur when there is adequate recharge capacity within the aquifer.

24. That the City has submitted their proposal entitled "ASR Permit Modification Proposal Revised Minimum Index Levels & Aquifer Maintenance Credits," dated March12, 2018, as supplemented by its May 22,2018 letter. The proposal contains accounting methods for Aquifer Maintenance Credits.

25. That the City is proposing an alternative procedure for establishing recharge credits during the periods when physical recharge of the aquifer is not feasible as further defined in its proposal. Surface water from the existing Little Arkansas River ASR diversion works would be treated at the ASR Phase II water treatment plant and sent directly to the City's Main Water Treatment Plant to be used for municipal supply. This water would offset diversions that would otherwise occur from the Equus Beds Wellfield, and allow the aquifer to remain at high levels.

26. That water left in the Equus Beds Wellfield as a result of using surface water from Appropriation of Water, File No. 46,627 directly would be considered as an ASR Aquifer Maintenance Credit (AMC), subject to a number of additional limitations referenced herein. The AMC accumulation rate is dependent on the quantity of water and rate of diversion authorized under Appropriation of Water, File No. 46,627, which is authorized 14,738.24 million gallons per year at a diversion rate of 41,667 gallons per minute. Accumulation of AMCs is also dependent on the quantity of water that is physically treated at the ASR Phase II water treatment plant.

27. That the total accumulation of physical recharge credits (PRCs) and AMCs combined cannot exceed 120,000 acre-feet at any time, which represents the documented amount of aquifer storage available within the ASR project area in 1993.

28. That AMCs will be assigned to index cells annually through the following accounting methodology:

- AMCs will be assigned by dividing the total volume of water diverted from the Little Arkansas River, treated at the ASR Phase II water treatment plant, and sent to the City's Main Water Treatment Plant by the total number of points of diversion within the Equus Beds Wellfield in service that year (excluding Phase I recharge and recovery infrastructure). This will ensure equal AMC distribution across the active production wells that could have pumped water from the aquifer, and provide greater flexibility for recharge recovery.
- 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. A review of field data, accounting reports, and multiple rounds

of groundwater modeling, all indicate that an initial loss rate of five percent mirrors the current physical recharge accounting practice over a range of aquifer levels and conditions.

- The gradational recurring annual loss would be applied across the BSA to account for the migration of recharge credits and losses from the BSA illustrated by the model and historic data based on Figure 15 – AMC Recurring Annual Credit Loss Percentage by Index Cell in the City's ASR Permit Modification Proposal. Generally, index cells on the west side would have a one percent (1%) loss, index cells in the central area a three percent (3%) loss, and index cells on the east side a five percent (5%) loss, reflecting the direction of groundwater flow and migration losses of recharge credits from the BSA. The actual physical recharge accounting process mirrors the proposed AMC recharge accounting process using the five percent initial and one, three, and five percent gradational losses.
- These losses would be taken from the cumulative total beginning the year after the water is recharged, as they represent losses to migration that occur during the year.

29. That loss rates of five percent (5%) initially and one to five percent (1-5%) annually are supported by the historic accounting process modeling, the drought modeling efforts, and the hydrogeological characteristics of the aquifer.

30. That the available quantity of AMCs for each index cell would be the cumulative total of AMCs accumulated during previous years, minus any recovered quantity of AMCs from the index cell, and annual losses.

31. That recovery of AMCs, similar to PRCs, will be measured as the metered recovery of a recharge credit from an authorized point of diversion. The recharge credits will be available for recovery when water levels within their individual index cell are above the established minimum index level as measured in January of that year. January groundwater levels are typically used to represent baseline aquifer levels by many state and local agencies.

32. That the City will develop an annual ASR Operations Plan that will be used to evaluate groundwater levels in the wellfield and the aquifer's physical recharge capacity. This information will determine when AMCs can be accumulated. The Operations Plan calculations will be based on the following parameters:

- Static Groundwater Elevations
- Maximum Groundwater Elevations
- Sustainable Specific Injectivity
- Maximum Calculated Sustainable Recharge Rate
- Maximum Well Infrastructure Recharge Rate

33. That the City agrees with the operating principle that native water rights should be utilized prior to recharge credits.

34. That AMCs are not passive recharge credits because they are using existing ASR infrastructure and require the active diversion and treatment of surface water in order to gain credits, and are subject to the rate and quantity limitations of the permit(s).

Order

NOW, THEREFORE, the following are the decisions of the Chief Engineer:

1. That applications to appropriate water for beneficial use, under File Nos. 48,704; 48,705; 48,706; 48,707; 48,708; 48,709; 48,710; 48,711; 48,712; 48,713; 48,714; 48,715; 48,716; 48,717; 48,718; 48,719; 48,720; 48,721; 48,722; 48,723; 48,724; 48,725; 48,726; 48,727; 48,728; 48,729; 48,730; 48,731; 48,732; and 48,733, shall be and are hereby approved, as set out in Attachments 1 through 30, and the City's existing appropriations of water as listed above in Findings Nos. 4 and 6, are hereby made part of this Order.

2. That passive recharge credits shall not be allowed.

3. That the basin storage area (BSA) and index cells for the project are as set forth in Attachment 2 to the Original Order, In the Matter of the City of Wichita's Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas dated August 8, 2005.

4. That the locations of the index wells for the BSA shall be as set forth in Attachment 3 to the Original Order, In the Matter of the City of Wichita's Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas dated August 8, 2005.

5. That the index cell water levels for the BSA as set forth in the Original Order dated August 8, 2005 and August 1, 2006, ("Modified Order"), Attachment 4, shall be modified as set forth in this Order dated _____ 2018, as described in Table 1, Attachment 31.

6. That the Model and accounting methodology remains as previously submitted for physical recharge credits, until otherwise modified by formal written approval of the Chief Engineer.

7. That if the City develops an improved model or methodology to account for water stored in the BSA that is approved by the Chief Engineer after consideration of the recommendation by GMD #2, the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

8. That the project shall be operated so that the measured water levels, and the water levels predicted by the Model, stay at or below the highest index water level any time water is being recharged into the BSA.

9. That water shall only be injected into the BSA by means of the injection wells when the water level at any required monitoring well located within 660 feet of an injection well is 10 feet or more below the land surface elevation at those observation wells. This condition must be maintained until such time that the applicant can demonstrate that allowing recharge water to exceed this level would be in the public interest. If the applicant can document that an alternative (shallower) water level would be protective of the public interest, the applicant may petition the Chief Engineer to modify or remove this requirement. That recharge credits may be withdrawn from a cell only when recharge credits are determined to be available from the cell and the static water level at its index well is above the lowest index level; however, water may be recharged when the static water level is below the lowest index level in that well.

10. That the City by June 1 each year shall report an accounting of water diverted from the surface water intake and recharged into the BSA in the Equus Beds Aquifer; that the Report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the Model and the accounting methodology described herein.

    In addition, the accounting report shall meet the requirements of K.A.R. 5-12-2, including specifically addressing the following items for each cell in the BSA:

    a. Natural and artificial recharge;

b. Groundwater inflow and outflow;
c. Evaporation and transpiration;
d. Groundwater water diversions from all non-domestic wells;
e. Infiltration from streams;
f. Groundwater discharge to streams; and
g. The calculated recharge credits.

11. That the final determination of available recharge credits in each cell in the BSA shall be made by the Chief Engineer, upon consideration of the report required in Paragraph No. 10, above, and any recommendation by GMD #2. The Chief Engineer shall make the final determination in writing.

12. That each ASR well shall be equipped with water flowmeters, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water injected into and diverted by each well.

13. That the source water used for artificial recharge shall not degrade the ambient groundwater use in the BSA, and shall comply with the source water definition in K.A.R, 5-1-1; that the water level monitoring at any ASR well site shall be automated with a frequency not to exceed six hours; that before operation of the proposed ASR wells, the City shall submit an operation plan that includes water level monitoring as well as water quality monitoring to establish baseline ambient groundwater quality, and which is sufficient to prevent impairment of the water quality beyond a reasonable economic limit to GMD #2 for review and comment, and the Chief Engineer for approval; that the plan should also be consistent with any requirements which KDHE may impose for any UIC permits KDHE may issue pertaining to the ASR wells.

14. That surface water intake quantities, aquifer injection quantities and water level data shall be reported by the City to the Chief Engineer and GMD #2 as follows:

a. Each month for the first year of operation;
b. Each calendar quarter for the second year of operation;
c. By March 1 each year thereafter; or
d. Other intervals as may be required by the Chief Engineer to properly evaluate the project.

15. That on or before June 1, of each calendar year, the City shall file an annual report with GMD #2, that shall contain the water balance in the BSA, and any additional information specified in K.A.R. 5-22-10.

16. That AMCs will be assigned to index cells annually through the following accounting methodology:

- AMCs will be assigned by dividing the total volume of water diverted from the Little Arkansas River, treated at the ASR Phase II water treatment plant , and sent to the City's Main Water Treatment Plant by the total number of points of diversion within the Equus Beds Wellfield in service that year (excluding Phase I recharge and recovery infrastructure). This will ensure equal AMC distribution across the active production wells, which could have pumped water from the aquifer.
- 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. A review of field data, accounting reports, and multiple rounds of groundwater modeling, all indicate that an initial loss rate of five percent mirrors the current physical recharge accounting practice over a range of aquifer levels and conditions.

- The gradational recurring loss would be applied across the BSA to account for the migration of recharge credits and losses from the BSA illustrated by the model and historic data. Generally, index cells on the west side would have a one percent (1%) loss, index cells in the central area a three percent (3%) loss, and index cells on the east side a five percent (5%) loss, reflecting the direction of groundwater flow and migration losses of recharge credits from the BSA. The actual physical recharge accounting process mirrors the proposed AMC recharge accounting process using the five percent initial and one, three, and five percent gradational losses.
- These losses would be taken from the cumulative total beginning the year after the water is recharged, as they represent losses to migration that occur during the year (see Figure 15 – AMC Recurring Annual Credit Loss Percentage by Index Cell in the City's ASR Permit Modification Proposal).

17. That if the City develops an improved model or methodology to account for AMCs that is approved by the Chief Engineer after consideration of the recommendation by GMD #2, the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

18. That the AMC project shall be operated when index cell water levels are at elevations that limit physical recharge into the BSA.

19. That AMCs may be withdrawn from a cell only when recharge credits are determined to be available from the cell and the static water level at its index well is at or above the lowest index level.

20. That the City by June 1 each year shall report an accounting of water diverted from the ASR surface water intake, treated at the ASR Phase II water treatment plant, and sent directly to the City's Main Water Treatment Plant. The report shall include the available quantity of AMCs for each index cell, based on the AMCs accumulated during previous years, minus any recovered quantity of AMCs from the index cells, and annual losses. The report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the accounting methodology described herein.

21. That the final determination of available AMCs in each cell in the BSA shall be made by the Chief Engineer, upon consideration of the required annual report, and any recommendation by GMD #2. The Chief Engineer shall make the final determination in writing.

22. That each AMC diversion well shall be equipped with a water flowmeter, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water diverted from the aquifer and counted as an AMC.

23. That surface water intake quantities and direct municipal supply quantities shall be reported by the City to the Chief Engineer and GMD #2 as follows:

    - Each month for the first year of operation;
    - Each calendar quarter for the second year of operation;
    - By March 1 each year thereafter; or
    - Other intervals as may be required by the Chief Engineer to properly evaluate the project.

24. That the City will develop an annual ASR Operations Plan that will be used to evaluate groundwater levels in the wellfield and the aquifer's physical recharge capacity, which will be annually submitted to GMD 2 for their review and comment

25. That the City's proposal entitled "ASR Permit Modification Proposal Revised Minimum Index Levels & Aquifer Maintenance Credits", dated March 12, 2018, is adopted by reference.

Petition for Review

Pursuant to K.S.A. 2004 Supp. 82a-711 and K.S.A. 2004 Supp. 82a-1901(a), if aggrieved by this Initial Order, the applicant may petition for administrative review in accordance with the provisions of the Kansas Administrative Procedure Act, K.S.A. 82a-77-501 et seq. The petition must be filed within 15 days after the date of service of this Initial Order and must set forth the basis for review. The petition for administrative review shall be in writing and shall be submitted to:

Jackie McClaskey, Secretary of Agriculture
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502
Fax: (785) 564-6777

Effective Date of Order; Final Agency Action

Unless a later date is stated herein, this Initial Order shall become effective and shall become a final agency action, as defined in K.S.A. 77-607(b), without further notice to the parties, if a petition for administrative review has been filed, as set forth herein, and the Secretary has issued an order stating that review will not be exercised.

If no party has filed a petition for administrative review by the Secretary and the Secretary has not given written notice of intention to exercise review, this Initial Order shall become effective and shall become a final agency action thirty (30) days after its service. K.S.A. 77-530.

Ordered this day of , 2018, in Topeka, Shawnee County, Kansas.

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

State of Kansas)
) SS
County of Riley)

The foregoing instrument was acknowledged before me this day of , 2018, by David W. Barfield, P.E., Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

_____
Notary Public

CERTIFICATE OF SERVICE

On this day of , 2018, I hereby certify that Approval of Application and Permit to Proceed, File Nos. 48,704; 48,705; 48,706; 48,707; 48,708; 48,709; 48,710; 48,711; 48,712; 48,713; 48,714; 48,715; 48,716; 48,717; 48,718; 48,719; 48,720; 48,721; 48,722; 48,723; 48,724; 48,725; 48,726; 48,727; 48,728; 48,729; 48,730; 48,731; 48,732; and 48,733, dated were mailed postage prepaid, first class, US mail to the following:

CITY OF WICHITA
WATER PRODUCTION - PUMPING
455 N MAIN ST 8TH FL
WICHITA KS 67202

With photocopies to:

EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO 2
313 SPRUCE
HALSTEAD KS 67046-1925

Stafford Field Office

_____
Division of Water Resources

List of Attachments to Order

1. Approval of Application and Permit to Proceed, File No. 48,704
2. Approval of Application and Permit to Proceed, File No. 48,705
3. Approval of Application and Permit to Proceed, File No. 48,706
4. Approval of Application and Permit to Proceed, File No. 48,707
5. Approval of Application and Permit to Proceed, File No. 48,708
6. Approval of Application and Permit to Proceed, File No. 48,709
7. Approval of Application and Permit to Proceed, File No. 48,710
8. Approval of Application and Permit to Proceed, File No. 48,711
9. Approval of Application and Permit to Proceed, File No. 48,712
10. Approval of Application and Permit to Proceed, File No. 48,713
11. Approval of Application and Permit to Proceed, File No. 48,714
12. Approval of Application and Permit to Proceed, File No. 48,715
13. Approval of Application and Permit to Proceed, File No. 48,716
14. Approval of Application and Permit to Proceed, File No. 48,717
15. Approval of Application and Permit to Proceed, File No. 48,718
16. Approval of Application and Permit to Proceed, File No. 48,719
17. Approval of Application and Permit to Proceed, File No. 48,720
18. Approval of Application and Permit to Proceed, File No. 48,721
19. Approval of Application and Permit to Proceed, File No. 48,722
20. Approval of Application and Permit to Proceed, File No. 48,723
21. Approval of Application and Permit to Proceed, File No. 48,724
22. Approval of Application and Permit to Proceed, File No. 48,725
23. Approval of Application and Permit to Proceed, File No. 48,726
24. Approval of Application and Permit to Proceed, File No. 48,727
25. Approval of Application and Permit to Proceed, File No. 48,728
26. Approval of Application and Permit to Proceed, File No. 48,729
27. Approval of Application and Permit to Proceed, File No. 48,730
28. Approval of Application and Permit to Proceed, File No. 48,731
29. Approval of Application and Permit to Proceed, File No. 48,732
30. Approval of Application and Permit to Proceed, File No. 48,733
31. TABLE 1. PROPOSED MINIMUM INDEX GROUNDWATER ELEVATIONS FOR THE CITY OF WICHITA AQUIFER STORAGE & RECOVERY PROJECT

THE STATE OF KANSAS

KANSAS DEPARTMENT OF AGRICULTURE
Jackie McClaskey, Secretary of Agriculture

DIVISION OF WATER RESOURCES
David W. Barfield, Chief Engineer

Draft ~~for review, March 22~~ June 1, 2018
Proposed Replacement F &O for ASR Phase II

Findings and Order
In the Matter of the City of Wichita's Phase II Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas

Findings

1. That in a Findings, Conclusion and Order dated August 8, 2005, on file in the office of the Chief Engineer, In the Matter of the City of Wichita's Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas ("Original Order"), the Chief Engineer approved Appropriation of Water, File Nos. 45,567~~,~~; 45,568~~,~~; 45,569~~,~~; 45,570~~,~~; 45,571~~,~~; 45,572~~,~~; 45,573~~,~~; 45,574~~,~~; 45,575~~,~~; 45,576~~,~~; and 46,081 proposing the appropriation of water for beneficial use.

2. That the Order had 24 Conditions including~~,~~ but not limited to designation of the basin storage area and index cells for the project area, locations of the index wells, approved model and accounting methodology, and reporting requirements.

3. That in a Findings and Order dated August 1, 2006, ("Modified Order"), the Chief Engineer modified the Original Order approving Appropriation of Water, File Nos. 45,567, 45,568, 45,569, 45,570, 45,571, 45,572, 45,573, 45,574, 45,575, 45,576, and 46,081, specifically permit Condition Nos. 9, 12, 14, 17, 20, and 23, pertinent to bank storage wells.

4. That on September 18, 2009, the Chief Engineer issued a Findings and Order approving Appropriation of Water, File Nos. 46,627; 46,714; 46,715; 46,716; 46,717; 46,718; 46,719; 46,720; 46,721; 46,722; 46,723; 46,724; 46,725; 46,726; 46,727; 46,728; 46,729; 46,730; 46,731; 46,732; 46,733; 47,178; 47,179; 47,180; and 47,181.

5. That in a Findings and Order dated December 21, 2009, the Chief Engineer modified the original Order and Modified Order, to be referred to as the "City of Wichita's Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas", without referencing specific file numbers in the title of the Orders; and Condition No. 23 of the Modified Order was revised to allow the project review to extend through 2010.

6. That on September 28, 2010, the Chief Engineer issued a Findings and Order approving Appropriation of Water, File Nos. 47,440; 47,448; 47,449; 47,450; 47,451; 47,452; and 47,453, proposing the appropriation of groundwater (recharge credits) for municipal use.

7. That on July 23, 2013, the City of Wichita (City) filed Applications, File Nos. 48,704; 48,705; 48,706; 48,707; 48,708; 48,709; 48,710; 48,711; 48,712; 48,713; 48,714; 48,715; 48,716; 48,717; 48,718; 48,719; 48,720; 48,721; 48,722; 48,723; 48,724; 48,725; 48,726; 48,727; 48,728; 48,729; 48,730; 48,731; 48,732; and 48,733, proposing the appropriation of groundwater (recharge credits) for municipal use.

8. That these new applications represent merely a continuance of Phase II of the Aquifer Storage and Recovery (ASR) project, wherein surface water will be diverted from the Little Arkansas River by means of a surface water intake (authorized under Appropriation of Water, File No. 46,627), treated, and injected into the Equus Beds Aquifer, to be later withdrawn by means of the same aquifer storage and recovery wells for municipal purposes.

9. That aquifer storage and recovery means the artificial recharge, storage and recovery of water and consists of apparatus for diversion, treatment, recharge, storage, extraction and distribution of water.

10. That the City and Equus Beds Groundwater Management District No. 2 (GMD #2) entered into a Memorandum of Understanding (M.O.U.), dated December 3, 2008, documenting the agreements made between the City and GMD #2, as to the proposed permitting, construction, and operation of Phase II of the aquifer storage and recovery project, a copy of which was subsequently received in the office of the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture (DWR) on January 20, 2009.

11. That as referenced by GMD #2 in their recommendation of approval, and to maintain consistency with the Phase I ASR project, the new applications shall be subject to the pertinent conditions established in the "Original Order", and as modified by the August 1, 2006 ("Modified Order"), more specifically identified as follows:

    A. That passive recharge credits shall not be allowed.

    B. That the basin storage area and index cells for the project are as set forth in Attachment 2 to the Original Order.

    C. That the locations of the index wells and the index water levels for the basin storage area shall be as set forth in Attachments 3 and 4 to the Original Order.

    D. That the Model and accounting methodology remains as previously submitted, until otherwise modified by formal written approval of the Chief Engineer.

    E. That if the City develops an improved model or methodology to account for water stored in the basin storage area that is approved by the Chief Engineer after consideration of the recommendation ~~of the~~by GMD #2, that the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

    F. That the project shall be operated so that the measured water levels, and the water levels predicted by the Model, stay at or below the highest index water level any time water is being recharged into the basin storage area.

    G. That water shall only be injected into the basin storage area by means of the injection wells when the water level at any required monitoring well located within 660 feet of an injection

well is 10 feet or more below the land surface elevation at those observation wells; that recharge credits may be withdrawn from a cell only when recharge credits are available from the cell and the static water level at its index well is above the lowest index level; however, water may be recharged when the static water level is below the lowest index level in that well.

H. That the City by June 1 each year shall report an accounting of water diverted from the surface water intake and recharged into the basin storage area in the Equus Beds Aquifer; that the Report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the Model and the accounting methodology described herein.

In addition, the accounting reports shall meet the requirements of K.A.R. 5-12-2, including specifically addressing the following items for each cell in the basin storage area:

- Natural and artificial recharge;
- Groundwater inflow and outflow;
- Evaporation and transpiration;
- Groundwater water diversions from all ~~non-domestic~~nondomestic wells;
- Infiltration from streams;
- Groundwater discharge to streams; and
- The calculated recharge credits.

That the final determination of available recharge credits in each cell in the basin storage area shall be made by the Chief Engineer, upon consideration of the report required in Paragraph H, above, and any recommendation by GMD #2. The Chief Engineer shall make the final determination in writing.

I. That each ASR well shall be equipped with water ~~flow meters~~flowmeters, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water injected into and diverted by each well.

J. That the source water used for artificial recharge shall not degrade the ambient groundwater quality use in the basin storage area, and shall comply with source water definition in K.A.R, 5-1-1; that the monitoring well network shown in Attachment 1 of this order is hereby approved; that the monitoring wells shall be drilled and completed at depths correlating to the recharge and recovery zone of the aquifer for the ASR wells for water sample collection, water level measurements and testing purposes; that the water level monitoring at any ASR well site shall be automated with a frequency not to exceed six hours; that before installation of any ASR well, the City shall submit a plan that includes water level monitoring as well as water quality monitoring to establish baseline ambient groundwater quality, which is sufficient to prevent impairment of the water quality beyond a reasonable economic limit, to GMD #2 for review and comment and the Chief Engineer for approval; that the plan should also be consistent with any requirement which ~~KDHE~~Kansas Department of Health and Environment may impose for any UIC permits KDHE may issue pertaining to the ASR wells.

K. That surface water intake quantities, aquifer injection quantities and water level data shall be reported by the City to the Chief Engineer and GMD #2 as follows:

- Each month for the first year of operation;

- Each calendar quarter for the second year of operation;
- By March 1 each year thereafter; or
- Other intervals as may be required by the Chief Engineer to properly evaluate the project.

L. That on or before June 1, of each calendar year, the City shall submit to the Chief Engineer and GMD #2, an annual accounting report for water in the basin storage area, utilizing the Model; that shall meet the requirements of K.A.R. 5-12-2.

M. That the City of Wichita shall simultaneously submit to the Chief Engineer and GMD #2 a formal report containing a description and scaled map of the as-built aquifer storage and recovery project.

12. That the GMD #2 Board of Directors have reviewed each of the *new applications* listed above and recommended them for approval, subject to specific conditions. [Must get GMD 2 review].

13. That use of the proposed ASR wells be authorized by the Kansas Department of Health and Environment (KDHE) as Class V Underground Injection Control (UIC) wells and that minimum water quality standards for effluent be approved by KDHE for organic and inorganic compounds, pesticides and bacteria; that the water recharged into the aquifer through the ASR wells comply with the source water definition in K.A.R. 5-1-1.

14. That GMD #2 recommends in order to establish baseline ambient groundwater quality prior to recharge, water quality analyses shall be completed at the applicant's expense for ~~sample~~samples collected from: a) domestic wells for which access can be obtained located within and immediately adjacent to each index cell in which recharge will occur, b) the proposed ASR wells, and c) all monitoring wells located in the index cells in which recharge will occur.

15. That there have been two previous public hearings concerning the ASR project, with the most recent held on April 29, 2009. The proposed wells described in these pending applications were depicted on a site map distributed to all who attended the meeting. In addition, there have been many other discussions and meetings with area landowners and well owners. [Modify after next hearing]

16. That the proposed applications represent only a continuance of the ASR Phase II project and the applications will be subject to the same permit conditions and limitations established for the previous files, and as modified herein.

17. That the City has conducted extensive modeling and data analysis to indicate that during a ~~prolong~~prolonged drought, groundwater elevations would drop below the current minimum index levels~~.~~ in some Index Cells. This would prevent the City from withdrawing some recharge credits when they are most needed.

18. That the City has proposed alternative minimum index levels, which on average are approximately 12.8 feet lower than current levels. Even at these levels, the aquifer will remain 80 percent full on average across the well field.

19. That based on this data and analysis, it is proposed that the minimum index level elevations be modified as shown in Table 1, in Attachment 31.

20. That this modification in minimum index level elevations will not prejudicially or unreasonably affect the public interest, and no senior rights will be impaired.

21. That the City of Wichita currently has multiple appropriations of water related to their Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas. The ~~Aquifer Storage and Recovery (~~ASR~~)~~ project diverts surface water from the Little Arkansas River by means of a surface water intake (authorized under Appropriation of Water, File No. 46,627). The surface water is treated and injected into the Equus Beds Aquifer, to be later withdrawn by means of the same aquifer storage and recovery wells for municipal purposes.

22. That currently the City can only accumulate recharge credits by physically recharging treated groundwater into the aquifer. At lowered water levels, that facilitate physical recharge, the existing ASR system is capable of recharging 34.5 million gallons per day. Physical recharging of the aquifer is severely limited during periods of elevated groundwater levels. The Equus Beds Wellfield has recovered to nearly ~~100 percent full (~~pre-development conditions~~)~~ in large part due to the City's reduced use from their Equus Beds Wellfield and increased use from Cheney Reservoir (USGS Scientific Investigations Report 2015-5042).

23. That physical recharge activities will continue to occur when there is adequate recharge capacity within the aquifer.

24. That the City has submitted their proposal entitled "ASR Permit Modification Proposal Revised Minimum Index Levels & Aquifer Maintenance Credits," dated March12, 2018, as supplemented by its May 22,2018 letter. The proposal contains accounting methods for Aquifer Maintenance Credits.

25. That the City is proposing an alternative procedure for establishing recharge credits during the periods when physical recharge of the aquifer is not feasible~~.~~ as further defined in its proposal. Surface water from the existing Little Arkansas River ASR diversion works would be treated at the ASR Phase II water treatment plant and sent directly to the City's Main Water Treatment Plant ~~and~~to be used for municipal supply. This water would offset diversions that would otherwise occur from the Equus Beds Wellfield, and allow the aquifer to remain at high levels.

~~That the City has submitted their proposal entitled "ASR Permit Modification Proposal Revised Minimum Index Levels & Aquifer Maintenance Credits". The proposal contains accounting methods for Aquifer Maintenance Credits.~~

26. That water left in the Equus Beds Wellfield as a result of using surface water from Appropriation of Water, File No. 46,627 directly would be considered as an ASR Aquifer Maintenance Credit (AMC), subject to a number of additional limitations referenced herein. The AMC accumulation rate is dependent on the quantity of water and rate of diversion authorized under Appropriation of Water, File No. 46,627, which is authorized 14,738.24 million gallons per year at a diversion rate of 41,667 gallons per minute. Accumulation of AMCs is also dependent on the quantity of water that is physically treated at the ASR Phase II water treatment plant.

27. That the total accumulation of physical recharge credits (PRCs) and AMCs combined cannot exceed 120,000 acre-feet at any time, which represents the ~~estimated~~documented amount of aquifer storage available within the ASR project area ~~during~~in 1993.

28. That AMCs will be assigned to index cells annually through the following accounting methodology:

- AMCs will be assigned by dividing the total volume of water diverted from the Little Arkansas River, treated at the ASR ~~diversion works~~Phase II water treatment plant, and sent to the City's Main Water Treatment Plant by the total number of points of diversion within the Equus Beds

Wellfield in service that year (excluding Phase I recharge and recovery infrastructure). This will ensure equal AMC distribution across the active production wells~~, which~~ that could have pumped water from the aquifer~~.~~, and provide greater flexibility for recharge recovery.

- 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. A review of field data, accounting reports, and multiple rounds of groundwater modeling, all indicate that an initial loss rate of five percent mirrors the current physical recharge accounting practice over a range of aquifer levels and conditions.
- The gradational recurring annual loss would be applied across the BSA to account for the migration of recharge credits and losses from the BSA illustrated by the model and historic data~~.~~ based on Figure 15 – AMC Recurring Annual Credit Loss Percentage by Index Cell in the City's ASR Permit Modification Proposal. Generally, index cells on the west side would have a one percent (1%) loss, index cells in the central area a three percent (3%) loss, and index cells on the east side a five percent (5%) loss~~.~~, reflecting the direction of groundwater flow and migration losses of recharge credits from the BSA. The actual physical recharge accounting process mirrors the proposed AMC recharge accounting process using the five percent initial and one, three, and five percent gradational losses. ~~These losses would be taken from the cumulative total beginning the year after the water is recharged, as they represent losses to migration that occur during the year (see Figure 15 – AMC Recurring Annual Credit Loss Percentage by Index Cell in the City's ASR Permit Modification Proposal).~~
- These losses would be taken from the cumulative total beginning the year after the water is recharged, as they represent losses to migration that occur during the year.

29. That loss rates of five percent (5%) initially and one to five percent (1-5%) annually are supported by the historic accounting process modeling, the drought modeling efforts, and the hydrogeological characteristics of the aquifer.

30. That the available quantity of AMCs for each index cell would be the cumulative total of AMCs accumulated during previous years, minus any recovered quantity of AMCs from the index cell, and annual losses.

31. That recovery of AMCs, similar to PRCs, will be measured as the metered recovery of a recharge credit from an authorized point of diversion. The recharge credits will be available for recovery when water levels within their individual index cell ~~is~~are above the established minimum index level as measured in January of that year. January groundwater levels are typically used to represent baseline aquifer levels by many state and local agencies.

~~31.~~32. That the City will develop an annual ASR Operations Plan that will be used to evaluate groundwater levels in the wellfield and the aquifer's physical recharge capacity. This information will determine when AMCs can be accumulated. The Operations Plan calculations will be based on the following parameters:

- Static Groundwater Elevations
- Maximum Groundwater Elevations
- Sustainable Specific Injectivity
- Maximum Calculated Sustainable Recharge Rate
- Maximum Well Infrastructure Recharge Rate
- ~~Maximum Well Infrastructure Recharge Rate~~

33. That the City agrees with the operating principle that native water rights should be utilized prior to recharge credits.

~~32.~~34. That AMCs are not passive recharge credits because they are using existing ASR infrastructure and require the active diversion and treatment of surface water in order to gain credits, and are subject to the rate and quantity limitations of the permit(s).

Order

NOW, THEREFORE, the following are the decisions of the Chief Engineer:

1. That applications to appropriate water for beneficial use, under File Nos. 48,704; 48,705; 48,706; 48,707; 48,708; 48,709; 48,710; 48,711; 48,712; 48,713; 48,714; 48,715; 48,716; 48,717; 48,718; 48,719; 48,720; 48,721; 48,722; 48,723; 48,724; 48,725; 48,726; 48,727; 48,728; 48,729; 48,730; 48,731; 48,732; and 48,733, shall be and are hereby approved, as set out in Attachments 1 through 30, and the City's existing appropriations of water as listed above in Findings Nos. 4 and 6, are hereby made part of this Order.

2. That passive recharge credits shall not be allowed.

3. That the basin storage area (BSA) and index cells for the project are as set forth in Attachment 2 to the Original Order, In the Matter of the City of Wichita's Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas dated August 8, 2005.

4. That the locations of the index wells for the ~~basin storage area~~BSA shall be as set forth in Attachment 3 to the Original Order, In the Matter of the City of Wichita's Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas dated August 8, 2005.

5. That the index cell water levels for the ~~basin storage area~~BSA as set forth in the Original Order dated August 8, 2005 and August 1, 2006, ("Modified Order"), Attachment 4, shall be modified as set forth in this Order dated _____ 2018, as described in Table 1, Attachment 31.

6. That the Model and accounting methodology remains as previously submitted for physical ~~rechargecredits~~recharge credits, until otherwise modified by formal written approval of the Chief Engineer.

7. That if the City develops an improved model or methodology to account for water stored in the ~~basin storage area~~BSA that is approved by the Chief Engineer after consideration of the recommendation ~~of the~~by GMD #2, ~~that~~ the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

8. That the project shall be operated so that the measured water levels, and the water levels predicted by the Model, stay at or below the highest index water level any time water is being recharged into the ~~basin storage area~~BSA.

9. That water shall only be injected into the ~~basin storage area~~BSA by means of the injection wells when the water level at any required monitoring well located within 660 feet of an injection well is 10 feet or more below the land surface elevation at those observation wells. This condition must be maintained until such time that the applicant can demonstrate that allowing recharge water to exceed this level would be in the public interest. If the applicant can document that an alternative (shallower) water level would be protective of the public interest, the applicant may petition the Chief Engineer to modify or remove this requirement. That recharge credits may be withdrawn from a

cell only when recharge credits are determined to be available from the cell and the static water level at its index well is above the lowest index level; however, water may be recharged when the static water level is below the lowest index level in that well.

10. That the City by June 1 each year shall report an accounting of water diverted from the surface water intake and recharged into the ~~basin storage area~~BSA in the Equus Beds Aquifer; that the Report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the Model and the accounting methodology described herein.

    In addition, the accounting report shall meet the requirements of K.A.R. 5-12-2, including specifically addressing the following items for each cell in the ~~basin storage area~~BSA:

    a. Natural and artificial recharge;
    b. Groundwater inflow and outflow;
    c. Evaporation and transpiration;
    d. Groundwater water diversions from all non-domestic wells;
    e. Infiltration from streams;
    f. Groundwater discharge to streams; and
    g. The calculated recharge credits.

11. That the final determination of available recharge credits in each cell in the ~~basin storage area~~BSA shall be made by the Chief Engineer, upon consideration of the report required in Paragraph No. 10, above, and any recommendation by GMD #2. The Chief Engineer shall make the final determination in writing.

12. That each ASR well shall be equipped with water ~~flow meters~~flowmeters, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water injected into and diverted by each well.

13. That the source water used for artificial recharge shall not degrade the ambient groundwater use in the ~~basin storage area~~BSA, and shall comply with the source water definition in K.A.R, 5-1-1; that the water level monitoring at any ASR well site shall be automated with a frequency not to exceed six hours; that before operation of the proposed ASR wells, the City shall submit an operation plan that includes water level monitoring as well as water quality monitoring to establish baseline ambient groundwater quality, and which is sufficient to prevent impairment of the water quality beyond a reasonable economic limit to GMD #2 for review and comment, and the Chief Engineer for approval; that the plan should also be consistent with any requirements which KDHE may impose for any UIC permits KDHE may issue pertaining to the ASR wells.

14. That surface water intake quantities, aquifer injection quantities and water level data shall be reported by the City to the Chief Engineer and GMD #2 as follows:

    a. Each month for the first year of operation;
    b. Each calendar quarter for the second year of operation;
    c. By March 1 each year thereafter; or
    d. Other intervals as may be required by the Chief Engineer to properly evaluate the project.

15. That on or before June 1, of each calendar year, the City shall file an annual report with GMD #2, that shall contain the water balance in the ~~basin storage area~~BSA, and any additional information specified in K.A.R. 5-22-10.

16. That AMCs will be assigned to index cells annually through the following accounting methodology:

- AMCs will be assigned by dividing the total volume of water diverted from the Little Arkansas River, treated at the ASR Phase II water treatment plant , and sent to the City's Main Water Treatment Plant by the total number of points of diversion within the Equus Beds Wellfield in service that year (excluding Phase I recharge and recovery infrastructure). This will ensure equal AMC distribution across the active production wells, which could have pumped water from the aquifer.
- 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. A review of field data, accounting reports, and multiple rounds of groundwater modeling, all indicate that an initial loss rate of five percent mirrors the current physical recharge accounting practice over a range of aquifer levels and conditions.
- The gradational recurring loss would be applied across the BSA to account for the migration of recharge credits and losses from the BSA illustrated by the model and historic data. Generally, index cells on the west side would have a one percent (1%) loss, index cells in the central area a three percent (3%) loss, and index cells on the east side a five percent (5%) loss~~.~~, reflecting the direction of groundwater flow and migration losses of recharge credits from the BSA. The actual physical recharge accounting process mirrors the proposed AMC recharge accounting process using the five percent initial and one, three, and five percent gradational losses. ~~These losses would be taken from the cumulative total beginning the year after the water is recharged, as they represent losses to migration that occur during the year.~~
- These losses would be taken from the cumulative total beginning the year after the water is recharged, as they represent losses to migration that occur during the year (see Figure 15 – AMC Recurring Annual Credit Loss Percentage by Index Cell in the City's ASR Permit Modification Proposal).

17. That if the City develops an improved model or methodology to account for AMCs that is approved by the Chief Engineer after consideration of the recommendation ~~of the~~by GMD #2, ~~that~~ the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

18. That the AMC project shall be operated when index cell water levels are at elevations that limit physical recharge into the ~~basin storage area~~BSA.

19. That AMCs may be withdrawn from a cell only when recharge credits are determined to be available from the cell and the static water level at its index well is at or above the lowest index level.

20. That the City by June 1 each year shall report an accounting of water diverted from the ASR surface water intake, treated at the ASR Phase II water treatment plant, and sent directly to the City's Main Water Treatment Plant. The report shall include the available quantity of AMCs for each index cell, based on the AMCs accumulated during previous years, minus any recovered quantity of AMCs from the index cells, and annual losses. The report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the accounting methodology described herein.

21. That the final determination of available AMCs in each cell in the ~~basin storage area~~BSA shall be made by the Chief Engineer, upon consideration of the required annual report, and any recommendation by GMD #2. The Chief Engineer shall make the final determination in writing.

22. That each AMC diversion well shall be equipped with a water ~~flow meter~~flowmeter, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water diverted from the aquifer and counted as an AMC.

23. That surface water intake quantities and direct municipal supply quantities shall be reported by the City to the Chief Engineer and GMD #2 as follows:

- Each month for the first year of operation;
- Each calendar quarter for the second year of operation;
- By March 1 each year thereafter; or
- Other intervals as may be required by the Chief Engineer to properly evaluate the project.

24. That the City will develop an annual ASR Operations Plan that will be used to evaluate groundwater levels in the wellfield and the aquifer's physical recharge capacity, which will be annually submitted to GMD 2 for their review and comment

~~24.~~25. That the City's proposal entitled "ASR Permit Modification Proposal Revised Minimum Index Levels & Aquifer Maintenance Credits", dated March 12, 2018, is adopted by reference.

Petition for Review

Pursuant to K.S.A. 2004 Supp. 82a-711 and K.S.A. 2004 Supp. 82a-1901(a), if aggrieved by this Initial Order, the applicant may petition for administrative review in accordance with the provisions of the Kansas Administrative Procedure Act, K.S.A. 82a-77-501 et seq. The petition must be filed within 15 days after the date of service of this Initial Order and must set forth the basis for review. The petition for administrative review shall be in writing and shall be submitted to:

Jackie McClaskey, Secretary of Agriculture
Kansas Department of Agriculture
1320 Research Park Drive
Manhattan, Kansas 66502
Fax: (785) 564-6777

Effective Date of Order; Final Agency Action

Unless a later date is stated herein, this Initial Order shall become effective and shall become a final agency action, as defined in K.S.A. 77-607(b), without further notice to the parties, if a petition for administrative review has been filed, as set forth herein, and the Secretary has issued an order stating that review will not be exercised.

If no party has filed a petition for administrative review by the Secretary and the Secretary has not given written notice of intention to exercise review, this Initial Order shall become effective and shall become a final agency action thirty (30) days after its service. K.S.A. 77-530.

Ordered this day of , 2018, in Topeka, Shawnee County, Kansas.

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

State of Kansas)
) SS
County of Riley)

The foregoing instrument was acknowledged before me this day of , 2018, by David W. Barfield, P.E., Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

Notary Public

CERTIFICATE OF SERVICE

On this day of , 2018, I hereby certify that Approval of Application and Permit to Proceed, File Nos. 48,704; 48,705; 48,706; 48,707; 48,708; 48,709; 48,710; 48,711; 48,712; 48,713; 48,714; 48,715; 48,716; 48,717; 48,718; 48,719; 48,720; 48,721; 48,722; 48,723; 48,724; 48,725; 48,726; 48,727; 48,728; 48,729; 48,730; 48,731; 48,732; and 48,733, dated were mailed postage prepaid, first class, US mail to the following:

CITY OF WICHITA
WATER PRODUCTION - PUMPING
455 N MAIN ST 8TH FL
WICHITA KS 67202

With photocopies to:

EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO 2
313 SPRUCE
HALSTEAD KS 67046-1925

Stafford Field Office

Division of Water Resources

List of Attachments to Order

1. Approval of Application and Permit to Proceed, File No. 48,704
2. Approval of Application and Permit to Proceed, File No. 48,705
3. Approval of Application and Permit to Proceed, File No. 48,706
4. Approval of Application and Permit to Proceed, File No. 48,707
5. Approval of Application and Permit to Proceed, File No. 48,708
6. Approval of Application and Permit to Proceed, File No. 48,709
7. Approval of Application and Permit to Proceed, File No. 48,710
8. Approval of Application and Permit to Proceed, File No. 48,711
9. Approval of Application and Permit to Proceed, File No. 48,712
10. Approval of Application and Permit to Proceed, File No. 48,713
11. Approval of Application and Permit to Proceed, File No. 48,714
12. Approval of Application and Permit to Proceed, File No. 48,715
13. Approval of Application and Permit to Proceed, File No. 48,716
14. Approval of Application and Permit to Proceed, File No. 48,717
15. Approval of Application and Permit to Proceed, File No. 48,718
16. Approval of Application and Permit to Proceed, File No. 48,719
17. Approval of Application and Permit to Proceed, File No. 48,720
18. Approval of Application and Permit to Proceed, File No. 48,721
19. Approval of Application and Permit to Proceed, File No. 48,722
20. Approval of Application and Permit to Proceed, File No. 48,723
21. Approval of Application and Permit to Proceed, File No. 48,724
22. Approval of Application and Permit to Proceed, File No. 48,725
23. Approval of Application and Permit to Proceed, File No. 48,726
24. Approval of Application and Permit to Proceed, File No. 48,727
25. Approval of Application and Permit to Proceed, File No. 48,728
26. Approval of Application and Permit to Proceed, File No. 48,729
27. Approval of Application and Permit to Proceed, File No. 48,730
28. Approval of Application and Permit to Proceed, File No. 48,731
29. Approval of Application and Permit to Proceed, File No. 48,732
30. Approval of Application and Permit to Proceed, File No. 48,733
31. TABLE 1. PROPOSED MINIMUM INDEX GROUNDWATER ELEVATIONS FOR THE CITY OF WICHITA AQUIFER STORAGE & RECOVERY PROJECT