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Kansas Department of Agriculture
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Water Resources
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March 19, 2018

RE: Opposition to Draft Proposal for Rattlesnake Creek LEMA

Dear Mr. Barfield:

We are writing to request that you do not approve, or in the alternative modify to exclude our property from, the proposed Rattlesnake Creek Local Enhanced Management Area (“the LEMA”). Specifically, we would like you to exclude areas within both the South Fork and the North Fork of the Ninnescah River (“the Ninnescah”) drainage and to restructure the plan to protect senior water rights to the extent practical in conformity with Kansas law. The undersigned have attempted to be heard by Groundwater Management District 5 (“GMD 5”) with no success and respectfully submit this memorandum for your review and consideration. Each of us has a vested interest in one or more water rights within the LEMA area.

On December 2, 2015, Kansas Department of Agriculture - Division of Water Resources (“DWR”) published an initial impairment investigation report for Quivira National Wildlife Refuge (“Quivira”) pursuant to the Kansas Water Appropriations Act (“KWAA”), K.S.A. § 82a-706b. In re Water Right File No. 7,571 (Dec. 2, 2015). As a result and at the direction of DWR, GMD 5 began a process to implement a LEMA in the area. After a public comment period, where GMD 5 provided no notice to potentially affected water right holders and faced significant pushback, GMD 5 issued the draft proposal of the LEMA on February 14, 2018. The LEMA suggests removing the end sprinklers from all center pivot irrigations in the area in an effort to increase stream flow in the Rattlesnake Creek and support Quivira’s senior rights. The LEMA extends south across northern Pratt County and covers a significant portion of the Ninnescah watershed area and many of the undersigned’s irrigated fields. Many, if not most, of the irrigators within the LEMA were and continue to be completely unaware that their rights are being silently hushed away as GMD 5 has failed to provide constitutionally proper notice to all irrigators who may be affected. We understand that the comment period to GMD 5 regarding the LEMA ended on March 15, 2018, but given the lack of notice, nature of this issue, similarity of other comments to our own, and private comments that have indicated a general lack of open-mindedness by the board of GMD 5, we feel it is more important to bring these matters up with the chief engineer in a good faith effort to promote efficiency and avoid judicial.

While each of us is sympathetic to Quivira's situation and are thankful to have such a strong conservation effort in our back yard, we cannot stand idly by while the statute designed to protect us is used to deprive us of our rights contrary to its intended purpose. This proposed LEMA lacks statutory support, is over-inclusive, and discriminates against senior water rights contrary to state law. Quivira's appropriate remedy is a private suit against junior water right holders; not using the bully pulpit to regulate away water rights contrary to state law.

BACKGROUND LAW

The Kansas Groundwater Management District Act ("KGMDA") allows for the creation of groundwater management districts with certain corporate powers. K.S.A. § 82a-1020 et. seq. Under it, the chief engineer is granted broad discretion to manage water resources, but he must conform with the KWAA. § 82a-1028o. In certain situations, the groundwater management district may designate an area as an intensive groundwater use control area ("IGUCA"). § 82a-1036. Designation is allowed when "(a) Groundwater levels in the area in question are declining or have declined excessively; or (b) the rate of withdrawal of groundwater within the area in question equals or exceeds the rate of recharge in such area; or (c) preventable waste of water is occurring or may occur within the area in question; [sic] (d) unreasonable deterioration of the quality of water is occurring or may occur within the area in question; or (e) other conditions exist within the area in question which require regulation in the public interest." *Id.* The chief engineer may also designate a LEMA when conditions (a) through (d) exist, but not when condition (e) exists alone, and only when the geographic boundaries are reasonable. § 82a-1041(a). This is likely due to the fact that a LEMA covers substantially more surface area than an IGUCA and may adversely affect more water rights. The LEMA process only exists to protect an aquifer, not surface water in this context and not an individual right.

Bearing this in mind, "administrative regulations do not supplant statutory law," which in the case of water is well established. Dep't of Admin. v. Pub. Emps. Relations Bd. of the Kan. Dept of Human Res., 894 P.2d 777, 786 (Kan. 1995). To properly interpret and implement the law, the agency must act in good faith. Robinson v. City of Wichita Emples. Ret. Bd. of Trs., 241 P.3d 15, 20 (Kan. 2010). "Usually, the legal interpretation of a statute by an administrative board or agency that is charged by the legislature with the authority to enforce the statute is entitled to great judicial deference." State ex rel. Stephan v. Kan. Racing Com., 792 P.2d 971, 979 (Kan. 1990). "Ordinarily, the court will give deference to the agency's interpretation of the law, but, when reviewing questions of law, the trial court may substitute its judgment for that of the agency." *Id.* (citing Kansas Bd. of Regents v. Pittsburg State Univ. Chap. of K-NEA, 667 P.2d 306 (Kan. 1983)). In construing statutes, the legislative intent must be determined from a general consideration of the entire act. State v. Adee, 740 P.2d 611, 615 (Kan. 1987). "If possible, effect must be given to all provisions of the act, and different provisions must be reconciled in a way

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that makes them consistent, harmonious, and sensible.” Id. If an agency acts beyond this reasonable interpretation, the court can “interfere to curb action which is ultra vires because of ... lack of antecedent legislative authority, or because the action is so arbitrary, capricious, unreasonable and subversive of private right as to indicate a clear abuse rather than a bona fide exercise of power.” Mid-West Photo Play Corp. v. Miller, 169 P. 1154, 1156 (Kan. 1918)

All of this must be taken in context with the Due Process Clause of the 14th Amendment. It provides that “no State shall deprive any person of life, liberty, or property, without due process of law. U.S. Const. Amend. XIV, § 1. “[T]he touchstone of due process is protection of the individual against arbitrary action of government,” Wolff v. McDonnell, 418 U.S. 539, 558 (1974), whether the fault lies in a denial of fundamental procedural fairness, see, e.g., Fuentes v. Shevin, 407 U.S. 67, 82 (1972) (the procedural due process guarantee protects against “arbitrary takings”), or in the exercise of power without any reasonable justification in the service of a legitimate governmental objective, see, e.g., Daniels v. Williams, 474 U.S. [327,] 331 (the substantive due process guarantee protects against government power arbitrarily and oppressively exercised). Cty. of Sacramento v. Lewis, 523 U.S. 833, 845-46 (1998). The test for a constitutional violation is conduct that shocks the conscience. This includes government behavior that does “not comport with traditional ideas of fair play and decency,” United States v. Salerno, 481 U.S. 739, 746 (1987); or that “interferes with rights ‘implicit in the concept of ordered liberty’” Palko v. Connecticut, 302 U.S. 319, 325-326 (1937)). Agency decisions are bound to the direction provided by the State’s legislature and Supreme Court. Doing otherwise would remove the citizen’s right to control the political process through voting and vest the power of government in unelected officials that are not subject to voter control. New York v. United States, 505 U.S. 144, 182 (1992).

The interpretation of declining groundwater levels under the KGMDA would be an issue of first impression for the Kansas Supreme Court. Impairment to surface rights may occur as a result of hydraulically-connected junior groundwater rights. Clawson v. State, 315 P.3d 896, 902 (Kan. App. 2013). This is not to say, however, that surface water is to be included within the definition of groundwater. Other case law makes it clear that stream flows and groundwater levels have their own distinct definitions. *See, e.g.*, Cochran v. Dep’t of Agric., Div. of Water Res., 249 P.3d 434, 441 (Kan. 2011) (discussing impairment as including *both* “unreasonable increase or decrease in stream flow” *and* “raising or lowering of the static water level” in the context of a new appropriations permit under K.S.A. 2010 Supp. 82a-711c.); F. Arthur Stone & Sons v. Gibson, 630 P.2d 1164, 1168-70 (1981) (discussing, at 1170, impairment as including *both* “unreasonable increase or decrease in stream flow” *and* “raising or lowering of the static water level” in the context of a new appropriations permit under K.S.A. 1980 Supp. 82a-711, and discussing, at 1168-69, the distinct differences in riparian regimes that focus on stream flow and prior appropriation regimes that apply special rules to groundwater).

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Kansas water rights follow a first in time first in right approach. In 1886, Kansas's legislature amended the common law riparian doctrine by allowing prior appropriation. Clark v. Allaman, 71 Kan. 206, 240-41 (1905). Under this approach, the rights to water ran with the land. Id. This appropriation method continued until 1945, when the KWAA allowed for the diversion of water that had been prior appropriated. K.S.A. § 82a-701 et. seq. (2018); L. 1945, ch. 390, § 1 et. seq. This law expressly provides that the "first in time is the first in right." § 82a-707c. Any water rights held under the prior legal scheme are "vested" and those obtained after the law are "appropriated." Garetson Bros. v. Am. Warrior Inc., 51 Kan. App. 2d 370, 380-81 (2015). The "chief engineer of DWR assigns each appropriation right a number - the lower the number, the higher the priority." Id. at 381. Quivira's water right file number is 7,571. "[T]he date of priority . . . and not the purpose of use, determines the right to divert and use water at any time when the supply is not sufficient to satisfy all water rights." Id. (citing K.S.A. 2014 Supp 82a-707(b)). The chief engineer "shall control, conserve, regulate, allot, and aid in the distribution of water resources in accordance with the rights of priority of appropriation." Id. at 382. The KGMDA was passed subsequently to and codified within the same section as the KWAA.

Any water right holder with a claim against a junior water right holder must follow a specific process for enforcing their rights. § 82a-716. The claimant must first petition the chief engineer to prevent future harmful diversion and the chief engineer will investigate the claim. § 82a-717a. The chief engineer may then issue an order that curtails junior rights in order to dispose of the complaint. Id. The chief engineer must act in a manner "consistent with K.S.A. 82a-706b," which states that "it shall be unlawful for any person to prevent . . . any waters of this state from moving to a person having a prior right to use the same." § 82a-706b. A "person" includes "any agency of the state or federal government." § 82a-701(a). "[A]n appropriator seeking to protect an allotment [has] the right to enjoin a junior appropriator's interference." Garetson, at 382. (citing K.S.A. 82a-716). Junior water rights are "subject to temporary curtailment by a more senior right." Id. (citing K.S.A. 82a-717a). Nowhere in Kansas law is an individual claimant, such as Quivira, entitled to use the LEMA process to remedy its impaired individual right.

Additionally, Kansas codified minimum stream flows for the Rattlesnake Creek basin in 1985. § 82a-703c. GMD 5 reached its sustainable yield and closed the area to new surface and groundwater appropriations on December 17, 1998. K.A.R. 5-25-4 (2016). The Kansas legislature also made it a condition of any permit issued after April 12, 1984, that it would be subject to minimum streamflow requirements, to be designated prior to July 1, 1990. § 82a-703b. The state legislature *expressly* exempted permits issued prior to April 12, 1984 from any minimum stream flow requirements. Id.

1. THE PROPOSED LEMA IS DEVOID OF STATUTORY SUPPORT AND MUST BE REJECTED AS ULTRA VIRES

Quivira has exercised its § 82a-717a rights and asked for the DWR to remedy the situation through the LEMA process. GMD 5 and the DWR have attempted to do so through arbitrary measures that are not “consistent, harmonious, and sensible” compared to the statute. Nothing in § 82a-717a indicates that the chief engineer may structure the remedy in a way that violates other provisions of Kansas law. Instead, the Kansas Supreme Court has repeatedly admonished agencies that they must act in good faith and reconcile statutes in a way that gives effect to all provisions of the statute.

Using the Adce test, it is abundantly clear that the Kansas legislature has intended for the DWR to use other methods to solve a simple stream flow impairment issue. Substituting the definition of “person” into § 82a-706b, the statute reads “it shall be unlawful for any agency of the state government to prevent . . . any waters of this state from moving to a person having a prior right to use the same.” The legislature granted the chief engineer broad authority to construct a remedy, so long as he did not impair senior water rights under § 82a-706b. In addition to this, the legislature has given the chief engineer clear direction to focus on water rights appropriated after April 12, 1984. The Kansas legislature is extraordinarily clear as to when the chief engineer may establish a LEMA. The statute references sections (a) through (d) of the section allowing for designation of an IGUCA, but specifically excludes section (e). Section (e) is a catch-all that allows designation of an IGUCA for reasons of public concern. The exclusion is specific and the DWR may not act outside of its granted authority. It is clear that the legislature intended the LEMA to be an extraordinary measure that even public policy could not allow, absent clear and enumerated dangers to the aquifer or surrounding watershed. The chief engineer is otherwise restricted from violating the KWAA within the groundwater management district. State statute, common law, and the U.S. Constitution prohibit the DWR from taking steps to use this project to protect an individual water right holder, no matter how senior it may be, absent an enumerated factor. Viewing the Kansas statute as a whole, senior water rights and all water rights acquired prior to April 12, 1984, are explicitly protected. Rather than acting with a “lack of antecedent legislative authority,” the chief engineer wants to directly violate existing legislative authority and use § 82a-717a to create a LEMA without an enumerated § 82a-1041a factor present. This would also allow the chief engineer to arbitrarily decide whether or not to give effect to §§ 82a-707c, 703b, and 706b in any impairment action. This interpretation is not a “bona fide exercise of power” and would give the DWR the ability to subvert private rights, veto acts of Congress that have been duly signed into law, and make the KWAA anything but “consistent, harmonious, and sensible.”

None of the four factors to designate a LEMA - declining groundwater, withdrawal exceeding recharge, preventable waste, and unreasonable deterioration of water quality - are present. In its

Request for Rattlesnake Creek LEMA, GMD 5 found that aquifer levels were steady, other than in extreme drought years. (Attached hereto as Ex. 1, p.2). All of southern Stafford County and northern Pratt County have greater recharge than use and an unlimited aquifer supply. *Estimated Usable Lifetime for the High Plains Aquifer*, Kansas Department of Agriculture - Division of Water Resources (June 22, 2016) (attached hereto as Ex. 2). Nothing in the impairment investigation report indicates that waste is responsible for any part of Quivira's lost stream flow and, in fact, the water applied by an end gun is completely consistent with the beneficial use required by the applicable water permit. Finally, water quality is not at issue here. Because none of these four allowed criteria exist and the chief engineer may not create a LEMA for matters of public concern, he must not approve the designation of this proposed LEMA.

Additionally, the DWR lacks the constitutional authority to use the LEMA as a remedy for a single impaired water right. The LEMA is subversive to the rights of 1,306 water rights holders by removing end guns from their center pivot irrigations in the area. The typical end gun in the area operates at around 100 gallons per minute, resulting in a total reduction in net withdrawal of 130,600 gallons per minute. This equates to 290 cubic feet per second, or 96% of Quivira's allotted 300 cubic feet per second. Many of the irrigations in the area operate between 700 and 1,000 gallons per minute. The average irrigator will see a 12% reduction in water usage inside the proposed LEMA boundary. All of this in exchange for restoring an *insignificant portion* of the inflow to Quivira. The Initial Report of the Chief Engineer states that the stream flow at Quivira must be increased by up to 5,000 acre-feet in order to meet its permitted diversion rate. This calculates to approximately a 6.5 cubic feet per second flow increase. Even considering a complete lack of irrigation over winter months, junior water right holders are asked to give up substantially more than Quivira gains. Quivira's entire 5,000 acre-foot need could be met by eliminating approximately 25 of the post-April 12, 1984, water right holders that were on notice that their right was subject to minimum stream flow requirements and located within the Rattlesnake Creek drainage. Ignoring state law and uniformly reducing 1,306 junior right holders' use by 12%, with a total reduction that nearly meets Quivira's (a single water right holder) total permitted use when it has only suffered a 2% loss should shock any rational person's conscience. Even if this LEMA were to meet the statutory requirements, it fails for Constitutional reasons.

We would like to note that many people in the area are willing to give up a portion of their junior water rights in an effort to either protect junior rights closer to Quivira from being completely cut off or from the potential of losing their own rights entirely. While this is an admirable endeavor on their part, we must point out that they lack any authority to speak for others whose rights may be impaired contrary to state law. We should view this as a stark reminder of why the United States Supreme Court and Constitution have reserved the power to dictate individual property rights to elected officials rather than those who remain unanswerable to the political process.

These comments should not be considered unless and until the DWR determines that it has the statutory authority to take action in this case.

Because the DWR may not use the LEMA to protect Quivira's senior water rights and increase stream flow in Rattlesnake Creek, even with a strong public interest in doing so, Quivira and the DWR must resort to other statutory remedies. Within the district, 95% of the water rights are junior to its own. Many are explicitly subject to minimum streamflow requirements. There is no end to the ways that Quivira may protect its rights, but using this process to uniformly deprive the rights of all irrigators in the area, especially those who are explicitly protected by § 82a-703b, is not one of them. At best, the LEMA appears to be a thinly-veiled political confiscation rather than a "bona fide exercise of power." Rather, as this issue involves stream flows on the Rattlesnake Creek, we strongly suggest that the DWR follow the legislative procedures already in place and look to water rights appropriated on or after April 12, 1984, before arbitrarily and capriciously reducing the rights of senior water right holders with specific statutory protection.

2. THE GEOGRAPHIC AREA IS UNREASONABLE BECAUSE THE LEMA COVERS A SIGNIFICANT AREA THAT DOES NOT DISCHARGE INTO RATTLESNAKE CREEK AND ITS IRRIGATION HAS A MINIMAL IMPACT ON STREAM FLOW IN RATTLESNAKE CREEK

Rattlesnake Creek crosses Pratt County for a few hundred yards in the West half of Section 6 Township 26 South Range 15 West. This is the most northwest section of Pratt County. It loses more water into Pratt County than it gains as the drainage area is quite limited due to the sandhills, and the porous soil causes seepage into the High Plains Aquifer as it crosses the county. *See, e.g., Geohydrology of Pratt County*, Kansas Geological Survey, http://www.kgs.ku.edu/General/Geology/Pratt/03_geog.html. The remainder of northern Pratt County is covered by the Ninnescah drainage.

Pratt County happens to be the headwaters of a number of small creeks with none, other than Rattlesnake Creek, flowing into or through it. The high recharge areas in Pratt County coincide with a number of spring-fed streams. For example, the North Fork of the Ninnescah starts in earnest along the Pratt County - Stafford County border about 2 miles east of Highway 281. It has seasonal headwaters that extend to south of Byers. The South Fork of the Ninnescah starts southwest of Byers and continually grows as it heads east through the county. Rattlesnake Creek has an elevation of 2,037 feet where it crosses Pratt County. *See* Google Earth. Eight miles to the east, Byers sits at 2,012 feet and is within the Ninnescah drainage. The headwaters of the North Fork of the Ninnescah sit at 1,898 feet and are a mere seventeen miles east. Rattlesnake Creek does not drop to this elevation until Saint John. Most of the wells in the area are in 100-200 feet thick deposits of coarse sand and gravel with the bedrock sloping down to the south and east. The 139 feet of elevation change through porous soil allows substantial recharge into the High

Plains Aquifer in Pratt County and back into the streams beyond. These streams carry far more water away from Rattlesnake Creek than any Pratt County center pivot irrigation. The unhappy fact is that reducing irrigation usage in Pratt County will not slow the continual seepage from Rattlesnake Creek to the Ninnescah and will do nothing to restore water flow to Quivira.

Water use in the Ninnescah drainage steadily tapers from high use to low use as one moves east and south across Pratt County. *See Groundwater Use Density*, Kansas Department of Agriculture - Division of Water Resources (Feb. 16, 2016) (attached hereto as Ex. 3). Despite the relatively heavy use in the area, the recharge in *all* of Pratt County exceeds the water use. (Ex. 2). Restricting the well-established rights of irrigators in Pratt County outside of the Rattlesnake Creek drainage area will not ebb the flow of groundwater into Pratt County.

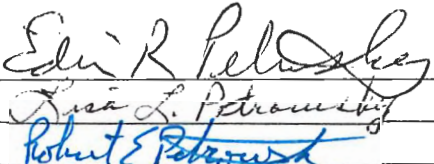
The statute specifically instructs the chief engineer that a LEMA must be reasonable in geographic scope. The geographic area of the LEMA is unreasonable and contrary to public policy.

CONCLUSION

Political decisions such as this are left to the hands of the duly elected legislators and they have spoken: the LEMA violates both Kansas law and the U.S. Constitution. Each of us reserves all of our rights and remedies, whether at law or in equity, both individually and in the aggregate.

Respectfully submitted,

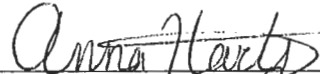
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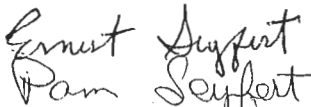
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Exhibit 1

Request for Rattlesnake Creek LEMA Submitted to the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources

XXXX XX, 2018

Overview and Goal Expression

In an effort to address Rattlesnake Creek streamflow concerns, groundwater depletions and their impact on Rattlesnake Creek, and to provide a remedy to the Quivira National Wildlife Refuge (“the Refuge”) impairment complaint in Big Bend Groundwater Management District #5 (“the District”), the District Board of Directors proposes the following plan be submitted via the Local Enhanced Management Area (“LEMA”) process per K.S.A. 82a-1041 for an area designated in Attachment 1.

The goal of the LEMA is to address conditions which require regulation in the public interest regarding streamflow depletion within an area of enhanced management (Attachment 1) and to provide streamflow augmentation to the Rattlesnake Creek stream channel. The LEMA is intended to reduce the hydrologic stress from irrigation operations on the aquifer and the interrelated stream systems, while restoring the supply to prior uses on the stream system. The particular objectives are to reduce water-use in the LEMA area to a degree that will temper the growth of future streamflow depletion, and to restore the useful supply to diversion points on the upper reaches of Rattlesnake Creek.

This LEMA shall be initiated as of XXXX XX, 2018. The proposed LEMA shall include all points of diversion within the LEMA boundaries.

The LEMA will combine the efforts of several parties to create a holistic approach to stabilizing the use of water in and around the Rattlesnake Creek subbasin. The District is seeking partner agencies at the state and federal levels in addition to working with both public and private organizations to bring all available resources together into a unified plan.

1) Background

The District has, for the past forty (40) years, striven to fulfill the following mission statement:

“Big Bend Groundwater Management District #5 was organized through the efforts of concerned citizens to conserve, promote, and manage groundwater resources so that quality and quantity of that resource will be maintained for present and future needs. The Groundwater Management laws (K.S.A. 82a-1020-1035) establish the right of local landowners and water users to determine their own destiny with respect to the use of groundwater within the basic law of the State of Kansas”

In the years leading up to the establishment of the District, the local landowners made a large investment to construct and operate wells for irrigation, stockwater, industrial and other types of beneficial use. The District’s management programs and subsequent regulations have greatly limited the groundwater development in many areas of the District.

In the District's first management program approved June 6, 1976, the Board of Directors recognized the unique nature of the local area and implemented guidelines to protect and conserve the Great Bend Prairie aquifer. These included strict monitoring of water use with flow meters, well spacing requirements, discouragement of waste of water and encouragement of the re-used water sources. In the 1979 district management program, the Board of Directors implemented a safe yield policy and maximum reasonable quantity for irrigation to limit the development even further. The District further solidified the safe yield for the area through the promulgation of K.A.R. 5-25-4 in 1980. By revising K.A.R. 5-25-4 in 1984, the Board of Directors further limited the safe yield policy to 3,000 acre-feet ("AF") in a two-mile radius. The District formally closed to new appropriations on December 17, 1998 through another revision to K.A.R. 5-25-4. As a result of these management objectives and regulations, the water level declines have been limited. In severely dry years, the District does experience declines in the local Great Bend Prairie aquifer. However in years of average to above average precipitation, the District recharges quickly.

In 1993, the Rattlesnake Creek Partnership ("Partnership") was formed to develop and implement solutions to water resource concerns within the subbasin. The Partnership was comprised of the District, Water Protection Association of Central Kansas ("Water PACK"), Kansas Department of Agriculture – Division of Water Resources, and United States Fish and Wildlife Service. In 2000, the Partnership developed the Rattlesnake Creek Management Program ("program") following several years of hydrologic study and public outreach. The program utilized new management tools (end gun removal, water banking, augmentation, multi-year flex accounts, etc.), education outreach program, and enhanced compliance and enforcement to achieve the established goals. Several of these programs were voluntary/incentive based tools that were not available at the beginning of the program. In fact, some of the programs did not get significant participation until after 2012. As a result, not every conservation goal outlined in the program was met at the end of the program in 2012.

In 1999, a task force was established to study the viability of water banking in Kansas. The task force determined that water banking could be a powerful incentive-based tool for conservation that will result in water being put to its most economic and beneficial use. However, there was no mechanism in Kansas statutes that would allow their establishment in Kansas. In 2001, K.S.A. 82a-761 *et seq.* was adopted by the legislature. K.S.A. 82a-765 requires that each chartered water bank will result in a savings of 10% or more in the total amount of groundwater consumed for a representative past period. In 2005, the Central Kansas Water Bank Association ("Association") became the first chartered water bank in the state. While the Association covers the same geographic boundaries, has the same staff, and utilizes the same monitoring network as the District, the Association is governed by a separate board of directors and funded entirely through its own administrative fees. The Association has undergone several changes since its inception in 2005, but still offers the same services to the water users of the region. The Association offers area water users with two programs for the flexible use of the water resource. The first program is for the transfer of a portion of the historical water use of a water right(s) to other areas within the same subbasin. The second program allows a portion of unused water to be preserved for future use at the same location. These programs have gained in popularity and giving water users added water use flexibility while conserving water.

In 2008, the District, with technical assistance and peer review from the Partnership, contracted with Balleau Groundwater Inc. to develop a high-resolution hydrologic model of the District (Balleau Groundwater, Inc., 2010). This hydrologic model is designed to have seven layers representing unique geologic formations below the ground surface. One of the primary reasons for multiple layers is to be able to track the movement of water between these layers. This is especially important for the area surrounding the Refuge, where the tracking of poor quality water will be important. The model has been the primary tool utilized by KDA-DWR and other stakeholders to evaluate the effects of groundwater pumping and surface drainage within the subbasin. However, the majority of the work conducted by KDA-DWR to date has been done using an alternative version of the model which flattens the seven layers into a single layer. When evaluating water movement, specifically lower quality water, the seven-layer model is the only option available that can conduct this analysis properly.

On April 8, 2013, the Service officially filed an impairment claim on the Rattlesnake Creek against junior appropriators within the subbasin. The Service stated that junior appropriators were reducing the flows in the Rattlesnake Creek such that their use prevented the Service from exercising Water Right File No. 7,571. Following this filing, the Chief Engineer and KDA-DWR staff began investigating the hydrologic effects of junior pumping on the subbasin. The District's hydrologic model was used to conduct this investigation in addition to further discussions with Service staff regarding water management at the Refuge. In July 2016, the Chief Engineer published the final report detailing the investigation (Barfield, 2016).

Since 2016, the District has submitted proposals to the Service in an effort to settle the impairment through agreement (Big Bend Groundwater Management District No. 5, 2016) (Big Bend Groundwater Management District No. 5, 2017). These proposals have been declined. The District remains committed to working to resolve the impairment utilizing the most current science and the most effective tools and programs available.

2) Reduce Hydrologic Stress and Augment Depleted Flows

- a. The District will work with water right holders and users to enhance the water use efficiency for all types of use within the LEMA boundary including, but is not limited to, irrigation, municipal, stockwater, recreation, domestic, and industrial uses. As an indicator of the amount of reduction in stress on the hydrologic system, the LEMA program is designed to benefit the stream at Zenith gage by cutting the projected growth in future depletion by half. The associated amount of reduction in water use has been estimated by modeling at 23,000 AFY, but implementation of the reduction may be adjusted due to climate variability.
- i. Irrigation Use: This will be achieved by requiring the removal of any nozzle at the end of the center pivot system that has a larger bore diameter than the previous nozzle on the center pivot system, commonly referred to as end guns. Effective December 31, 2018, all of these types of end guns will be removed to prevent the wetting of the acres beyond the end of the center pivot system.

District staff has compiled a database of the end guns within the LEMA boundary. These locations are indicated in Attachment 2. As of January 2015, the District

determined that there were 1306 end guns installed on center pivot systems within the LEMA boundary. The District has worked hard to estimate the water savings that will result by removing end guns. The District estimates a savings of 19,000 AFY. Modeling suggests that this amount of reduction in pumping will lessen the growth of future depletion at Zenith. Additional management action to reduce water use will also be needed. The model suggests that another 4,000 AFY of water use needs to be curtailed in the focused area 5 to 10 miles around St John (Attachment 3), to attain a halving of future depletion trends at Zenith gage.

In addition to the removal of end guns on center pivot systems, the use of other technologies that increase the efficiency of water use will be promoted. Such technologies include, but not limited to, mobile drip irrigation, soil moisture probes, telemetry monitoring, and variable rate irrigation. The District will work with state and federal agencies to provide attractive cost shares for the implementation of technologies that conserve water.

Water technology farms are a good way to showcase these technologies to nearby producers. Through these farms, producers can see how the implementation of new technologies can save water while maintaining or improving the economic viability of the area. Through the LEMA, the District will work to promote the establishment of additional technology farms within the LEMA boundary.

- ii. Municipal Use: According to the U.S. Geological Survey, (Lanning-Rush & Restrepo-Osorio, 2017) the average gallons per capita per day (gpcd) for public water suppliers (PWS) in Kansas is 114 gpcd over the past 5 years. There are seven PWS within the LEMA boundary:

Public Water Supplier	GPCD (2011-2015)	UFW (2011-2015)
Belpre	152	21 %
Greensburg	283	11 %
Haviland	152	8 %
Macksville	123	12 %
Mullinville	203	15 %
Stafford	124	12 %
St John	140	20 %

The U.S. Geological Survey study also calculated the percent unaccounted for water (UFW) for each PWS. The gpcd and ufw are listed above.

The Great Bend Prairie Regional Advisory Committee (“the RAC”) has a goal to attain less than 20% water loss by 2025. The RAC’s goals go on to reach less than 10% water loss by 2045. The District will work with the RAC and each municipality to reduce the gpcd and ufw. This will involve educational outreach to schools and public service groups.

- iii. Stockwater Use: There are thirteen feedlots within the LEMA area. The District will work with each facility, KDA–DWR, and KLA to improve the efficiency of water delivery where feasible through existing tools available. Some of these tools are the utilization of thermostatically controlled tanks vs continuous flow water tanks and the implementation of water reuse systems. The water savings will be on a case by case basis.
- iv. Recreation Use: There are 31 water rights within the LEMA area for recreation use. The District intends to work with each to ensure the water being utilized for this use is put to beneficial use when appropriate for the area in which they are diverting water.

The District will work with state agencies to ensure that water rights with existing conservation plans are brought up-to-date to promote more efficient methods of operations that are specific to the needs of each water right.
- v. Industrial Use: There are 26 water rights for industrial use within the LEMA area. These uses will be reviewed to determine if where water efficiencies can be gained. Encourage the use of lower quality water where feasible as a replacement for high quality water.

3) LEMA Operation

a. End-Gun Program

Reducing the stress from pumping will entail taking action to curtail some of that use. A few dozen pre-1957 priority operators can be excluded from the end gun curtailment program unless they elect voluntarily to participate. An additional 4,000 AFY of water use will be curtailed in the area of focused impact on the stream in the vicinity of St John (Attachment 3). The reduction in water use in this area will be achieved through the implementation of several secondary objectives that include but are not limited to: 1) permanent retirement of water rights through the expansion of the Conservation Reserve Enhancement Program (“CREP”) and the Water Transition Assistance Program (“WTAP”), 2) permanent purchase and retirement of water rights by the District, 3) permanent movement of water from hydrologically sensitive areas to lesser sensitive areas, or 4) temporary water leases through the Association.

The response to the LEMA program, expressed as lesser growth of depletion at Zenith gage and at the diversion points of Quivira NWR will be seen slowly during the LEMA period. It is not practical to measure that response at the gage, due to the other factors (weather and a myriad of variables in streamflow other than irrigation) that affect the baseline in the absence of the LEMA program. The success of this aspect of the program will be evaluated by examining water-use reports over 5-year periods.

b. Augmentation Program

In 2014, Governor Sam Brownback signed into law a provision specific to the Rattlesnake Creek subbasin to “allow augmentation for the replacement in time, location

and quantity of the unlawful diversion, if such replacement is available and offered voluntarily.” This legislation had overwhelming supporting testimony from several groups from across the State that resulted in unanimous action from the Kansas legislature to approve this bill. The concept of augmentation is to utilize the aquifer underground as a reservoir to supply water to the stream in times of shortage.

Augmentation will be implemented from a to-be-constructed wellfield designed for up to 15 cfs (cubic feet per second) capacity. Based on the analysis conducted by Balleau Groundwater Inc. (“BGW”), the intent of augmentation is to provide an additional tool to enhance the unique habitat the Refuge provides for various endangered species. The ability to utilize underground water in times of need further protects “the biological integrity, diversity and environmental health of the Refuge.” The area surrounding the Refuge has been underdeveloped for large-scale irrigation historically due to the water quality in the upper zones of the aquifer. However, this area does have a substantial quantity of water that can be appropriated in a sustainable manner. The sources supporting the augmentation wellfield have been examined in a water-accounting model as was done in the impairment analysis. The yield is supported by induced capture of evapotranspiration from adjacent water-logged soils and wetland vegetation, in addition to sources captured from formerly-rejected recharge by making space available in the aquifer. Rattlesnake Creek is to be augmented by waters that are now lost to the atmosphere, bypassed as storm runoff in Peace Creek, or discharged as brackish baseflow to the east. This further supports the concept of augmentation as a remedy for the impairment at the Refuge.

According to the various augmentation studies conducted within this subbasin, there are several key factors that need to be addressed. These include, but are not limited to: wellfield location, wellfield capacity, pumping rate, delivery rate, water quality, delivery frequency, and delivery location. The District has analyzed augmentation for each factor. The timeframe in which the augmentation well field will be implemented is outlined in Attachment 4.

i. Location

A wellfield south of the Refuge has been identified as an optimal location for the foreseeable future. The precise locations of this wellfield have not been finalized as further studies will be needed to determine water availability and quality. However, a conceptual augmentation system is shown in Attachment 5. The water table in this area is stable enough to support augmentation. The large-scale development for irrigation and other practices has been limited due to the natural water quality in the area. The water quality in the upper zones of the aquifer is very similar to the water quality already feeding the Little Salt Marsh. The conceptual wellfield is thought to overlie areas that can safely yield higher quantities of freshwater without risk of up-coning of poor quality water. Further site specific test drilling will be required to ensure proper placement of wells in a way to protect the upper zone of the aquifer from degradation. The multi-layer aquifer model simulates shallow fresh-water ingress to the wells at a higher rate and volume, dominating and diluting any smaller upward migration from saline sources. Observation wells will be installed to provide additional locations to test water quality and verify water table elevations, and eventual trends of water quality. The concept is to

use a location in T23S, R10W south of Peace Creek and west of Salt Marsh Road. Wells will be sited with screen lengths and depths to access the yield and quality of water suited to the Refuge requirement as presented, or the range of 3,000 to 9,000 $\mu\text{S}/\text{cm}$ in terms of specific conductance.

ii. Diversion & Delivery Rate

The District will pay the cost to develop, construct, and operate a 15 cfs wellfield south of the Refuge. Based on conversations with the Chief Engineer, we have determined that up to 15 cfs is an appropriate max flow rate/instantaneous capacity. Water will then be delivered directly to the Rattlesnake Creek channel immediately upstream of the Refuge. The discharge released to the stream is intended to make up the diversions required to serve the Refuge water right file # 7571 of 1957 priority date. Depletion of the stream will be relieved to the extent that the end gun program slows the future growth of effects on the stream. That effect is not expected to fully reverse trends or to provide a complete offset of future depletion; thus the augmentation wells will serve to deliver flow sufficient to meet the objective for serviceable supply on this reach of Rattlesnake Creek. Water lines will be installed in a manner that will minimize any disturbance to surface lands and utilize already authorized right of ways where possible to get access to the creek channel. This delivery location complies with the statutory requirement of K.S.A. 82a-706b (a)(2) to allow augmentation as a remedy. It is assumed that an NPDES permit will be applied for and approved due to the similarity of ground and surface-water quality in the area. Kansas Surface Water Quality Standards recognize the chloride content of Rattlesnake Creek above Little Salt Marsh being 1400 mg/l.

iii. Real-Time Operation

The hands-on operation of the augmentation wellfield does not hinge on knowing the magnitude of effects from the end gun program. The wellfield will deliver a make-up flow to the stream depending on conditions of streamflow and diversion requirement as observed. Diversion requirements are given by the Refuge and applied with practical considerations in the Chief Engineer impairment analysis and subsequently. The peak 15 cfs wellfield has the ability to serve those requirements. Calculations and diversion reports suggest that about one-third of the time augmentation will not be needed, one-third of the time the 15 cfs will be needed, and a wellfield release of 5 or 6 cfs will characterize the middle third of days. The Refuge is understood to have operable storage capacity to accommodate at least a week's volume if the deliveries over or under perform for a few cfs for a few days. The District proposes that the delivery rate be set weekly in coordination with Refuge requests and DWR staff review of conditions on the stream. Rain, high flows or bypass of the Refuge diversions would warrant shut-down of augmentation delivery, then restoration when those conditions pass. The Refuge reports about 25 cfs as the peak month average diversion rate. If that is the current diversion capacity on the Refuge, then augmentation can be shut down at higher flows. The Refuge and District will need to coordinate such factors. As confidence in standard practice is realized, the initial hands-on control of discharge might be handed over from The District to DWR or Refuge staff.

iv. Annual Water Quantity

The augmentation well field will release an adequate volume of suitable groundwater delivered to the creek channel for use by the Refuge to meet the management objectives for maintaining forage and habitat. The water provided will be measured for rate and quality at the point it is placed in the creek channel. The capacity of the wellfield exceeds the 5,000 AFY amount suggested to relieve the impairment, in most years, of the Service's water right at the Refuge in the Chief Engineer's final impairment report. In the Chief Engineer's final impairment report, the analysis conducted was retroactive and reviewed any impairment that may have occurred prior to the Refuge's claim of impairment in 2013. Based on a prospective analysis by BGW that looks at years after the 2013 claim of impairment, augmentation pumping is sustainable, effective, and does not degrade the quality of water the Refuge requires. The authority for such water will be processed in the same manner as any other water right with KDA-DWR. This evaluation by KDA-DWR will further ensure that there will not be an increase in permitted consumptive use in the area. The new appropriative water right will be considered non-consumptive as the quantity authorized will be combined and limited to the authorized quantity already appropriated under Water Right File No. 7571. In no calendar year will the combined quantity diverted from the augmentation well fields and the surface diversions at the Refuge exceed 14,632 AF.

v. Water Quality

The quality of this water would fall within the specified range (3,000 to 9,000 $\mu\text{S}/\text{cm}$) presented by the Service. The water quality can be managed based on the requirements of Refuge staff by providing more or less fresh water from redundant capacity of wells with varying water quality. As stated before, the water quality in the aquifer surrounding the Refuge is to the source of the baseflow water quality utilized in Little Salt Marsh. As a result, the water quality at the Refuge will not be altered in suitability for use through the implementation of the augmentation plan. Coordination with Kansas Department of Health and Environment will be crucial in this process to ensure the water quality of the Rattlesnake Creek stream channel is maintained throughout this project.

vi. Drought

In times of severe drought, as defined by the Palmer Drought Severity Index of -3.0 or less, augmentation will continue to be provided to those water management structures defined in the Service's water conservation plan as adopted in October 2000. The following is the implementation plan for initializing the Drought Contingency Plan per the October 2000 water conservation plan:

1. *If the mean daily January flow at Zenith gage (Rattlesnake Creek near Zenith) is less than 25 cfs, the Refuge will anticipate that a drought year may occur.*
2. *A review will be made in July using the Palmer Drought Severity Index to determine if drought conditions exist. Palmer Drought Severity Index in Region 8 of Kansas is -3.0 or lower, most diversions to the north of Pools 14A and 14B will cease, and water will be primarily concentrated in Pools 5, 7, 10A, 10B, 11, 14A, and 14B.*
3. *Diversions from the Little Salt Marsh (Pool 5) will continue to be made until it is determined that wildlife habitat in the Little Salt Marsh is being detrimentally affected to the point that it offsets the benefits of putting it in another unit, at*

- which time all diversions out of the Little Salt Marsh will cease.*
4. *Water will primarily be maintained in Pools 5, 7, 10A, 10B, 11, 14A, and 14B, unless sufficient precipitation occurs to raise the Palmer Drought Severity Index to greater than -1.0 or streamflow recovers to the point where it becomes possible to fill units to the north of the designated units.*

Augmentation shall not occur in times of bypass flow or times of release from storage in Little Salt Marsh. The augmentation water must be put to a concurrent beneficial use or held in storage for later beneficial use.

4) Central Kansas Water Bank Association

- a. The District is fortunate to have the only functioning water bank in the state of Kansas. This provides a unique opportunity to allow for additional flexibility in the water use of the area while implementing real water conservation. In the early years (2005-2010), there was little participation in the Association due to restrictive rules, uninformed public, and confusing methodologies. The Association has addressed these issues through public outreach meetings and amendments to statute, rules, and policies governing water bank activity. In recent years there have been significant advances in the participation from area water users. It is anticipated that this growth will continue in coming years. The Association is beginning another evaluation required by statute by an independent panel of experts in water law, economics, geology, and hydrology. The District intends to work with the Association to update the programs to promote the movement of water away from highly sensitive areas within the Rattlesnake Creek subbasin.
- b. The review process will take time to be completed. As a result, it is difficult to estimate the outcome of the review in addition to the timeliness of the updates.
- c. The District has partnered with The Nature Conservancy (“TNC”) to pursue funding to incentivize the transfers of water out of areas of concern. The intent of this funding is to provide added financial incentive to water users in priority areas to deposit water into the Association for use outside of these priority areas. By providing financial incentive it is believed that this will further promote these transfers and provide added water conservation for areas of high impact to the stream channel.

5) Violations

- a. The LEMA order of designation shall serve as initial notice of the creation of the LEMA and its terms and conditions to all water right owners within the Rattlesnake Creek LEMA area on its effective date.
- b. Upon the District learning of an alleged violation, District staff will provide DWR with the information the District believes shows the alleged violation. DWR, under its discretion, may investigate and impose restrictions and fines as described below or allowed by law.

- c. In the event that the District or DWR determine that a water user is operating the a center pivot system with a functional end gun installed, DWR will address these violations as follows:
 - i. operation of the end gun within the first six months of the LEMA plan will result in notification of the offense to the landowner;
 - ii. operation of the end gun following the first six months of the LEMA plan will result in an automatic one-year suspension of the water right and a \$1,000 fine for every day of operation up to a maximum of \$10,000.
- d. DWR will address violations of the authorized quantities as follows:
 - i. exceeding any total allocation quantity of less than 4 AF within the allocation period will result in a \$1,000 fine for every day the allocation was exceeded;
 - ii. exceeding any total allocation quantity of 4 AF or more within the allocation period will result in an automatic two-year suspension of the water right and a \$1,000 fine for every day the allocation was exceeded up to a maximum of \$10,000.
- e. In addition to other authorized enforcement procedures, if the District Board finds by a preponderance of evidence of watering of unauthorized acres, waste of water, meter tampering, removing the meter while pumping, or any other overt act designed to alter the metered quantity as described in K.A.R. 5-14-10 occurred, then the District Board will make a recommendation to the Chief Engineer that a written order be issued which states:
 - i. the nature of the violation;
 - ii. the factual basis for the violation; and
 - iii. that the water right is suspended for 5 years.

6) Meters

- a. All water right owners shall be responsible for ensuring their water flow meters are in compliance with state and local law(s). In addition to maintaining compliance and reporting water usage annually from each point of diversion, all water right owners shall Install and maintain an alternative method of determining the time that the well is operating. This information must be sufficient to be used to determine operating time in the event of a meter failure. Should the alternative method fail or be determined inaccurate the well shall be assumed to have pumped its full annual authorized quantity for the year in question. Well owners/operators are encouraged to give the details of the alternative method in advance to District staff in order to insure that the data is sufficient.
- b. Any water right owner or authorized designee who finds a flow meter that is inoperable or inaccurate shall within 48 hours contact the district office concerning the matter and provide the following information:
 - i. water right file number;
 - ii. legal description of the well;
 - iii. date the problem was discovered;

- iv. flow meter model, make, registering units and serial number;
 - v. the meter reading on the date discovered;
 - vi. description of the problem;
 - vii. what alternative method is going to be used to track the quantity of water diverted while the inoperable or inaccurate meter is being repaired/replaced;
 - viii. the projected date that the meter will be repaired or replaced; and
 - ix. Any other information requested by the District staff or Board regarding the inoperable or inaccurate flow meter.
- c. Whenever an inoperable or inaccurate meter is repaired or replaced, the owner or authorized designee shall submit form DWR 1-560 Water Flowmeter Repair/Replacement Report to the district within seven days.
 - d. This metering protocol shall be a specific annual review issue and if discovered to be ineffective, specific adjustments shall be recommended to the chief engineer by the advisory committee.

7) Advisory Committee

- a. The Rattlesnake Creek LEMA Advisory Committee shall be appointed and maintained by the District board consisting of 7 members as follows: one (1) District staff; one (1) District Board Member; one (1) representative of the Division of Water Resources, Kansas Department of Agriculture as designated by the Chief Engineer; and the balance being stakeholders from within the Rattlesnake Creek LEMA area. One of the Rattlesnake Creek LEMA members shall chair the committee whose direction shall be set to further organize and meet annually to consider:
 - i. water use data;
 - ii. water table information;
 - iii. economic data as is available;
 - iv. compliance and enforcement issues;
 - v. any new and preferable enhanced management authorities become available;
 - vi. other items deemed pertinent to the advisory committee.

The reduction in pumping in Zone D (4,000 AFY) and the overall LEMA (23,000 AFY) will be evaluated for years 2020-2024. The 5-year accumulated reported-use targets are in the range of XXX,XXX AF and XXX,XXX AF respectively in the two areas. The reduction in pumping is to reduce future depletions at Zenith gage. The future years of water-use report performance will be adjusted for evapotranspiration and precipitation by a correlation to pumping as has been found by KDA-DWR. The correlation is strong but has a remaining uncertainty in the 5-year averages of about 3 percent of pumping, thus the 5-year pumping target to be derived by correlation to evapotranspiration and precipitation, will have statistical leeway of +or- XXXXX AFY before backstops or credits are administered for the next period.

8) LEMA Order Reviews

- a. The LEMA will be evaluated twice in the first ten (10) years, which would allow the parties to revisit the terms and evaluate its efficacy after a meaningful period of observation.
- b. In addition to the annual status reviews per Section 7, the Rattlesnake Creek LEMA Advisory Committee shall also conduct a more formal LEMA Order review every five years within the term of the LEMA. The first of these reviews shall be for the years 2020-2024. Review items will focus on economic impacts to the LEMA area and the local public interest. Water level data may be reviewed by the committee.
- c. The committee, in conjunction with KDA–DWR and the District, shall also produce a report following each formal review to the chief engineer and the District board which contains specific recommendations regarding future LEMA actions. All recommendations shall be supported by reports, data, testimonials, affidavits or other information of record.

9) Alternative Corrective Controls

- a. The LEMA Order review identified in Section 8 shall be conducted in a manner to determine if further revisions to the order are necessary at that time. The committee, in conjunction with KDA–DWR and the District, shall review:
 - i. The reports and imagery of end gun acres reduced will be examined alongside the model results for the volume saved. The 4,000 AFY of reduced water use near St John will also be included in the 23,000 AFY reduction of LEMA-wide water use. If the program is considered successful, no modified controls will be necessary. If considered ineffective, then the options in b. below will be implemented.
 - ii. The implementation of Section 3 will be reviewed to determine the effect augmentation has on the immediate area surrounding the well field. The goal for augmentation implementation is a fully-operational peak 15 cfs well field and delivery system to the Rattlesnake Creek stream channel. If the wellfield has not been completed to deliver water, then the options in c. below will be implemented.
- b. If the goals are not met before the LEMA Order review, the following corrective controls will be implemented in 2025.
 - i. For the period 2025-2029, the water right allocations shall be adjusted as follows [to be finalized upon further discussion with stakeholders. Items under consideration, but not limited to, Priority and Stream Response]:
 1. water rights located within the area designated as having greater than XX% stream response at the Zenith gage station and with priority date after August 15, 1957 and on or before April 12, 1984 shall have the annual appropriations reduced by XX% for the five-year period;
 2. water rights located within the area designated as having greater than XX% stream response at the Zenith gage station and with priority date after April 12, 1984 shall have the annual appropriations reduced by XX% for the five-year period;

3. water rights located within the area designated as having less than XX% stream response at the Zenith gage station and with priority date after August 15, 1957 and on or before April 12, 1984 shall have the annual appropriations reduced by XX% for the five-year period;
 4. water rights located within the area designated as having less than XX% stream response at the Zenith gage station and with priority date after April 12, 1984 shall have the annual appropriations reduced by XX% for the five-year period.
- c. To be determined in discussions with KDA-DWR.

10) Impairment Complaints

- a. While this program is being undertaken, the District stakeholders request that any impairment complaint filed in the district while this management plan is in effect, which is based upon either water supply issues or a regional decline impairment cause, be received by the Chief Engineer, and be investigated by the Chief Engineer with consideration to the on-going Local Enhanced Management Area activities.

11) Water Level Monitoring

- a. The District maintains a routine water level measurement network throughout the Rattlesnake Creek subbasin area. This monitoring will continue throughout the term of the LEMA plan. In addition to the existing network, the District will install observation wells as necessary to monitor the impact of the augmentation well field. These measurements will be a part of the existing WIZARD database curated by the Kansas Geological Survey.

12) Water Quality Monitoring

- a. The District has been monitoring the surface water quality along the Rattlesnake Creek channel for several years. This monitoring will continue throughout the term of the LEMA plan no less than on a quarterly basis. The observation wells that will be installed around the augmentation well field will be sampled routinely to enhance the understanding of the water quality in this area. Coordination with Kansas Department of Health and Environment will be crucial in this process to ensure the water quality of the Rattlesnake Creek stream channel is maintained throughout this project.

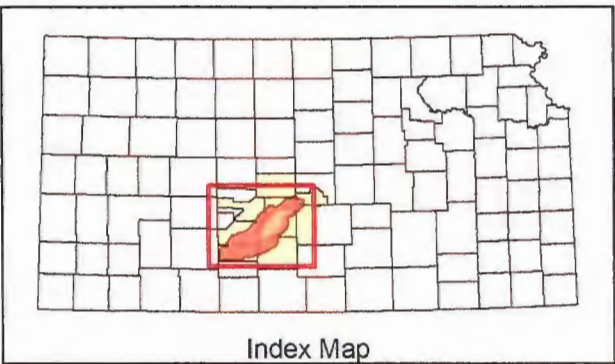
13) Coordination

- a. The District stakeholders and the Board of Directors expect reasonable coordination between the Chief Engineer's office and the District board on at least the following efforts:
 - i. Development of the LEMA Order resulting from the LEMA process;
 - ii. Compliance and enforcement of the Rattlesnake Creek LEMA order;
 - iii. Annual reporting of water usage and evaluation of progress toward overall LEMA goals.

References

- Balleau Groundwater, Inc. (2010). *Hydrologic Model of Big Bend Groundwater Management District No. 5*. consultant report prepared for Big Bend GMD #5.
- Barfield, D. (2016). *Final Report of the Chief Engineer*. Manhattan: Kansas Department of Agriculture - Division of Water Resources.
- Big Bend Groundwater Management District No. 5. (2016). *Stakeholder Proposal in Connection with USFWS Impairment Complaint*. Stafford: Big Bend Groundwater Management District No. 5.
- Big Bend Groundwater Management District No. 5. (2017). *Second Stakeholder Proposal in Connection with USFWS Impairment Complaint*. Stafford: Big Bend Groundwater Management District No. 5.
- Lanning-Rush, J., & Restrepo-Osorio, D. (2017). *Public-Supply Water Use in Kansas 2015*. U.S. Geological Survey.

PROPOSED LEMA BOUNDARY



Index Map

By formal motion on August 11, 2017, Big Bend GMD#5 is pursuing a Local Enhanced Management Area (LEMA) within the area shown.

The map was created by combining the Zone A response area (>10%) and the Rattlesnake Creek subbasin.

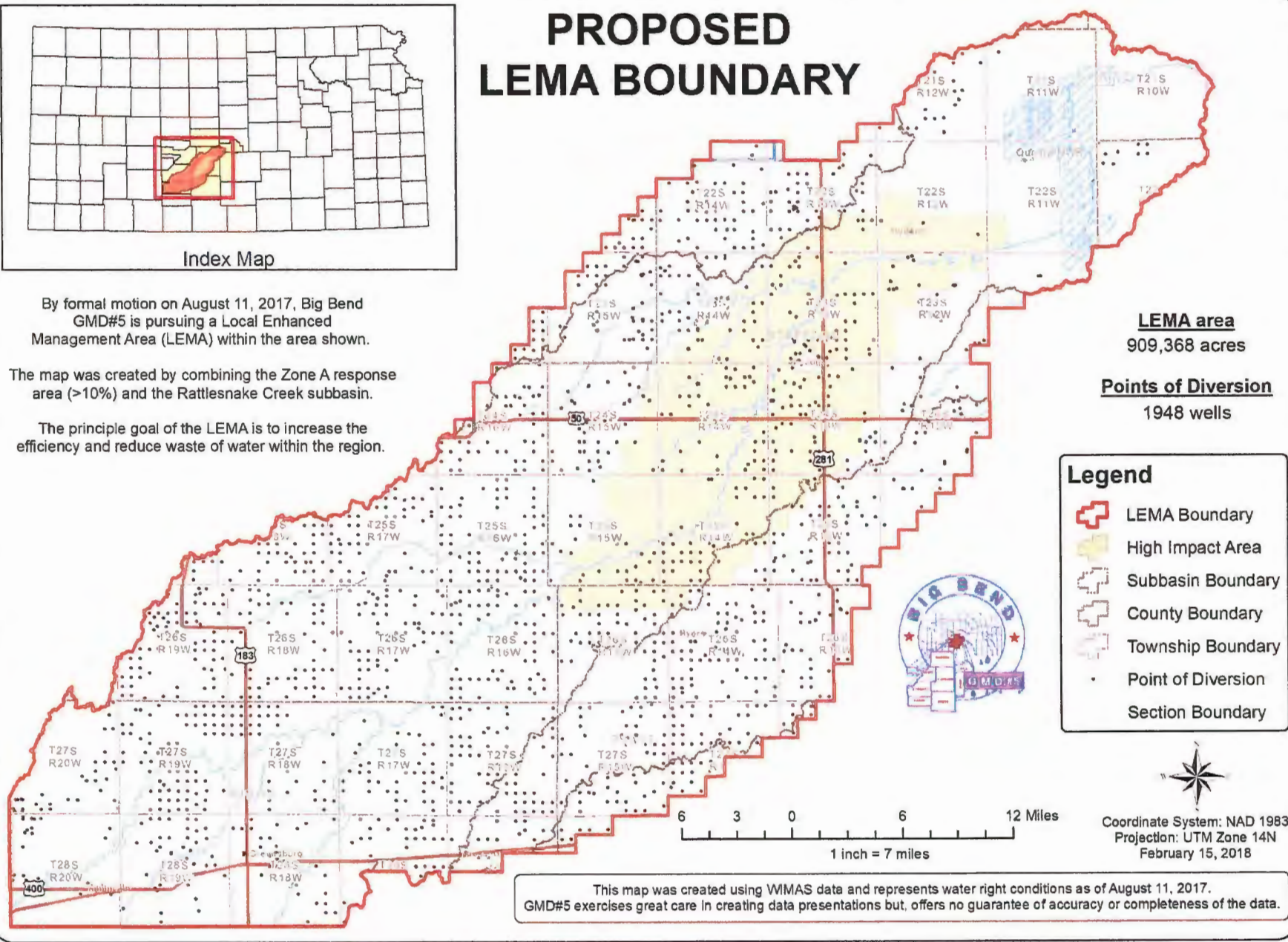
The principle goal of the LEMA is to increase the efficiency and reduce waste of water within the region.

LEMA area
 909,368 acres

Points of Diversion
 1948 wells

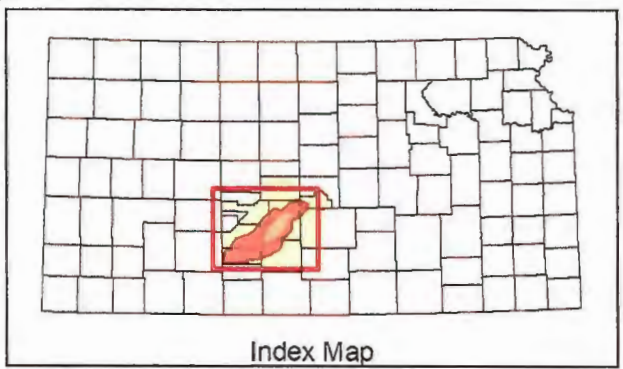
Legend

- LEMA Boundary
- High Impact Area
- Subbasin Boundary
- County Boundary
- Township Boundary
- Point of Diversion
- Section Boundary



This map was created using WIMAS data and represents water right conditions as of August 11, 2017. GMD#5 exercises great care in creating data presentations but, offers no guarantee of accuracy or completeness of the data.

PROPOSED LEMA BOUNDARY



Index Map

By formal motion on August 11, 2017, Big Bend GMD#5 is pursuing a Local Enhanced Management Area (LEMA) within the area shown.

The map was created by combining the Zone A response area (>10%) and the Rattlesnake Creek subbasin.

The principle goal of the LEMA is to increase the efficiency and reduce waste of water within the region. Shown are the locations of the end guns as determined by District site inspections.

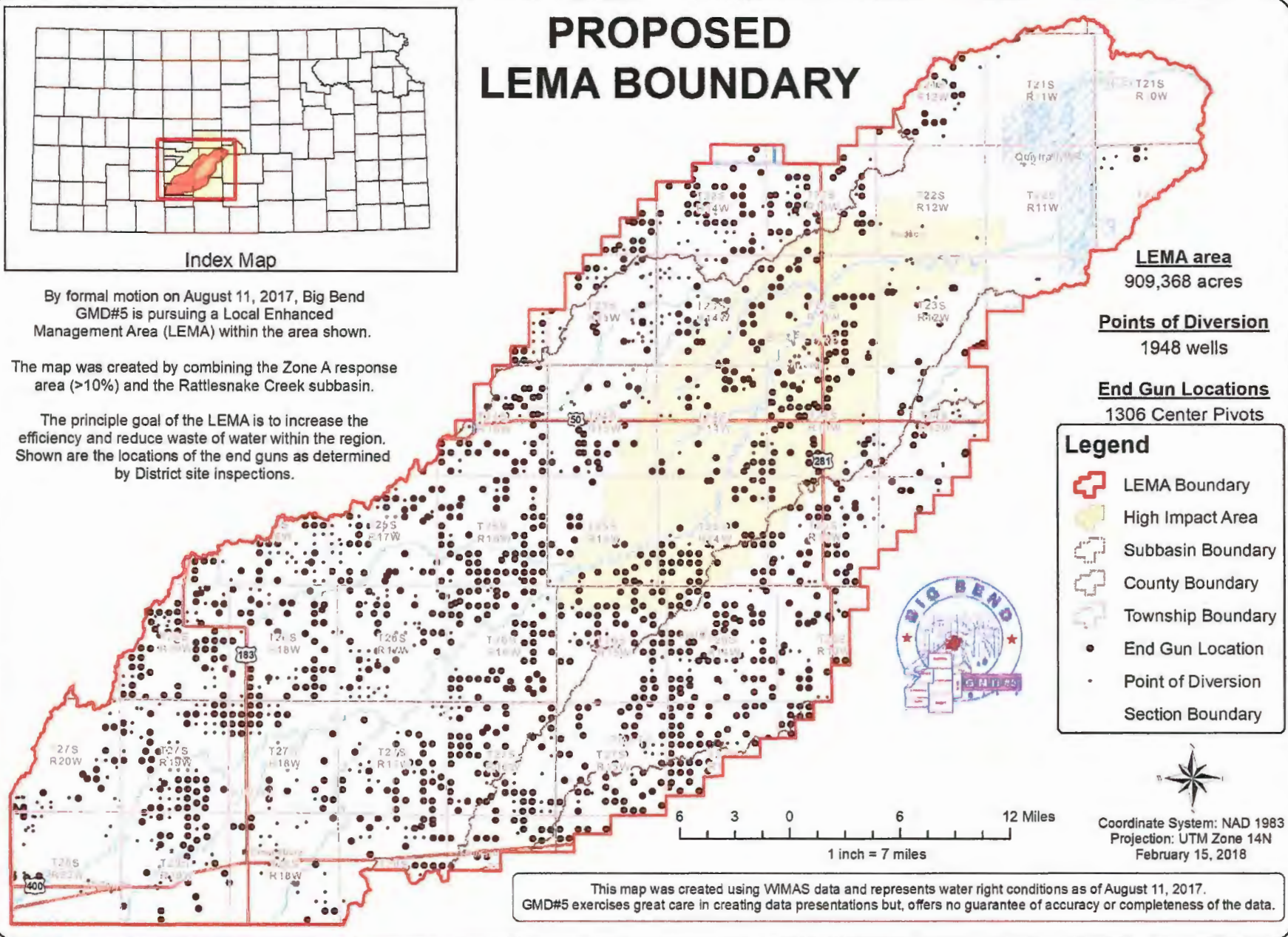
LEMA area
909,368 acres

Points of Diversion
1948 wells

End Gun Locations
1306 Center Pivots

Legend

- LEMA Boundary
- High Impact Area
- Subbasin Boundary
- County Boundary
- Township Boundary
- End Gun Location
- Point of Diversion
- Section Boundary

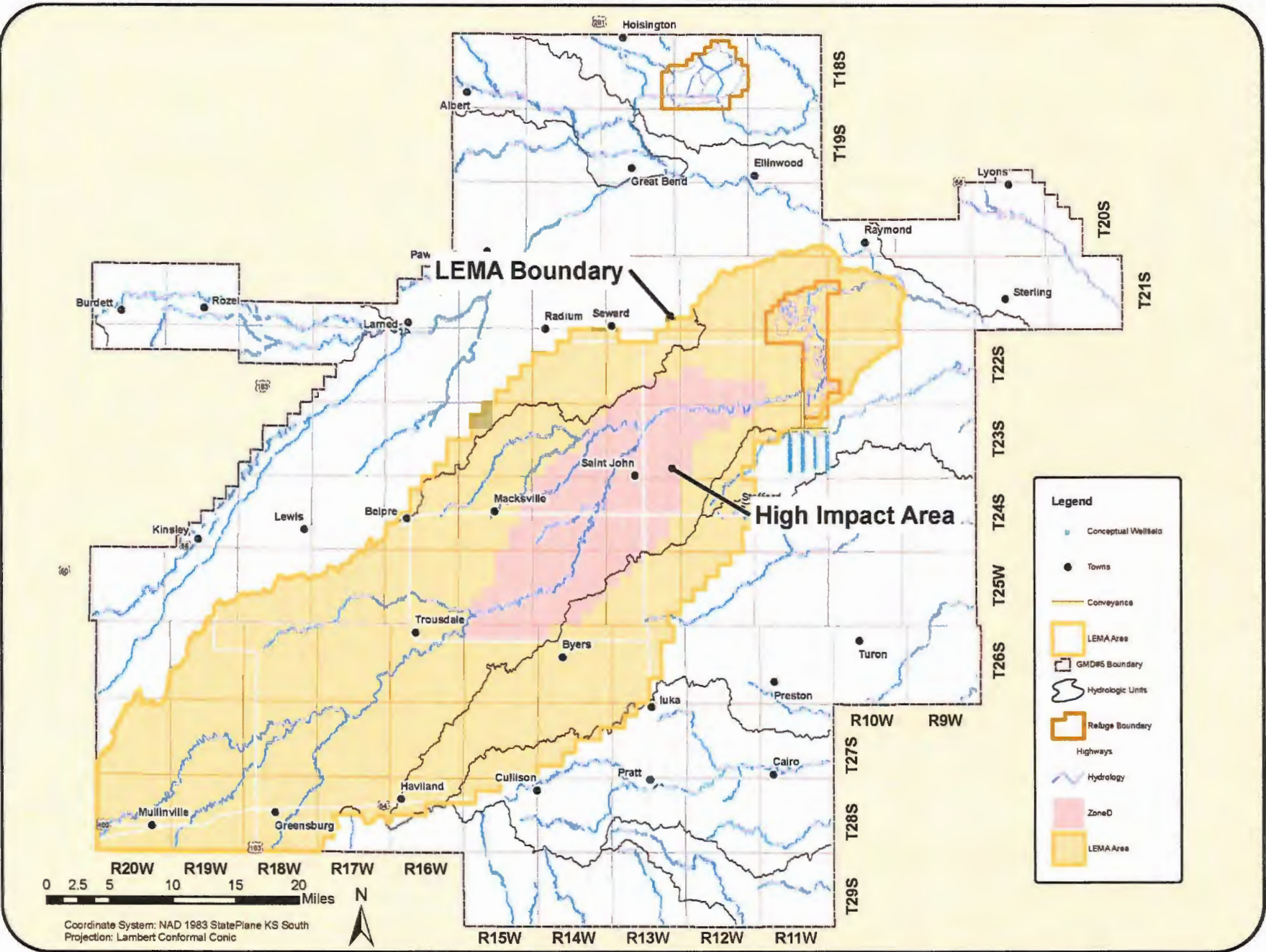


6 3 0 6 12 Miles
1 inch = 7 miles



Coordinate System: NAD 1983
Projection: UTM Zone 14N
February 15, 2018

This map was created using WIMAS data and represents water right conditions as of August 11, 2017. GMD#5 exercises great care in creating data presentations but, offers no guarantee of accuracy or completeness of the data.

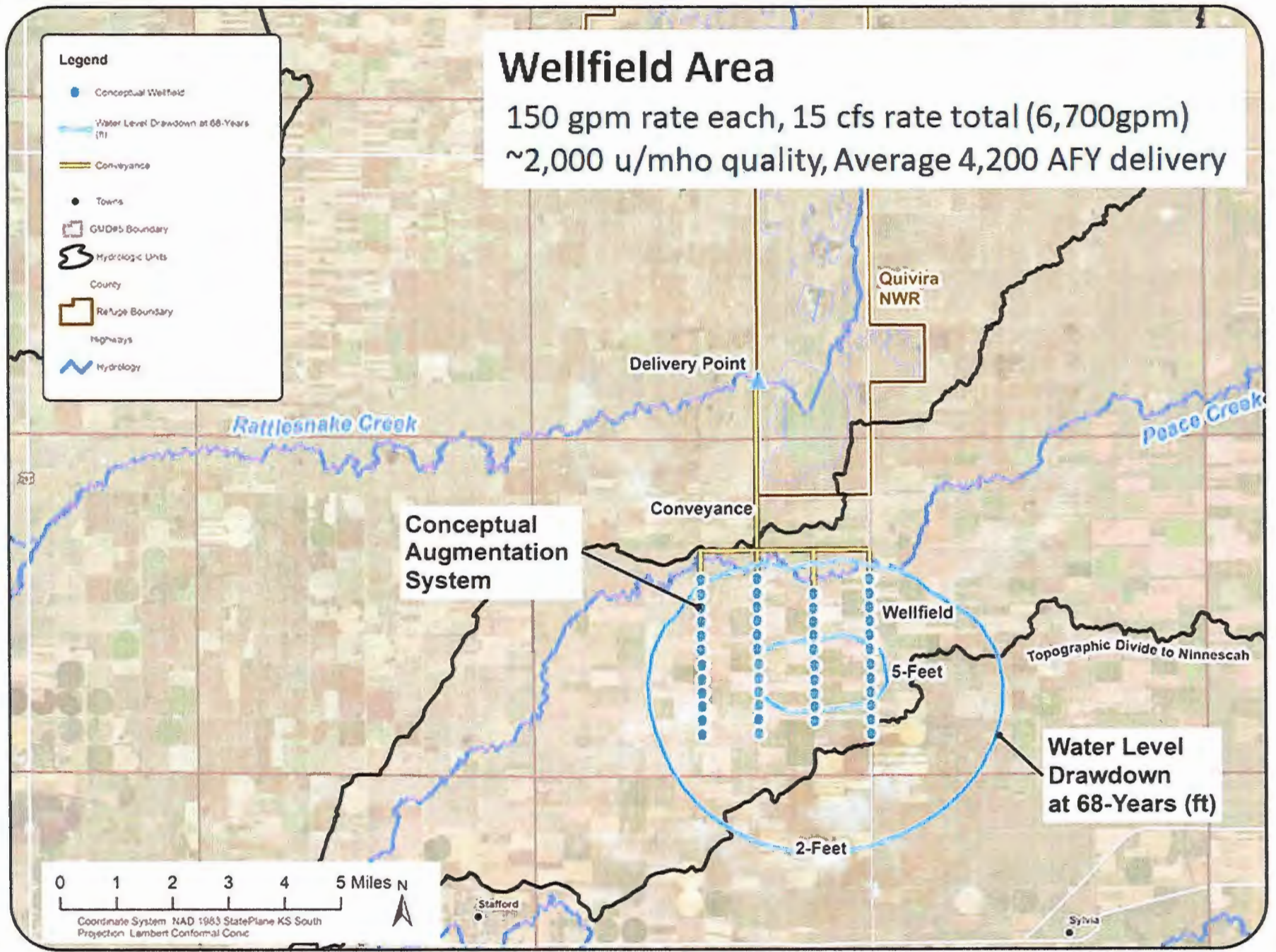


Coordinate System: NAD 1983 StatePlane KS South
 Projection: Lambert Conformal Conic

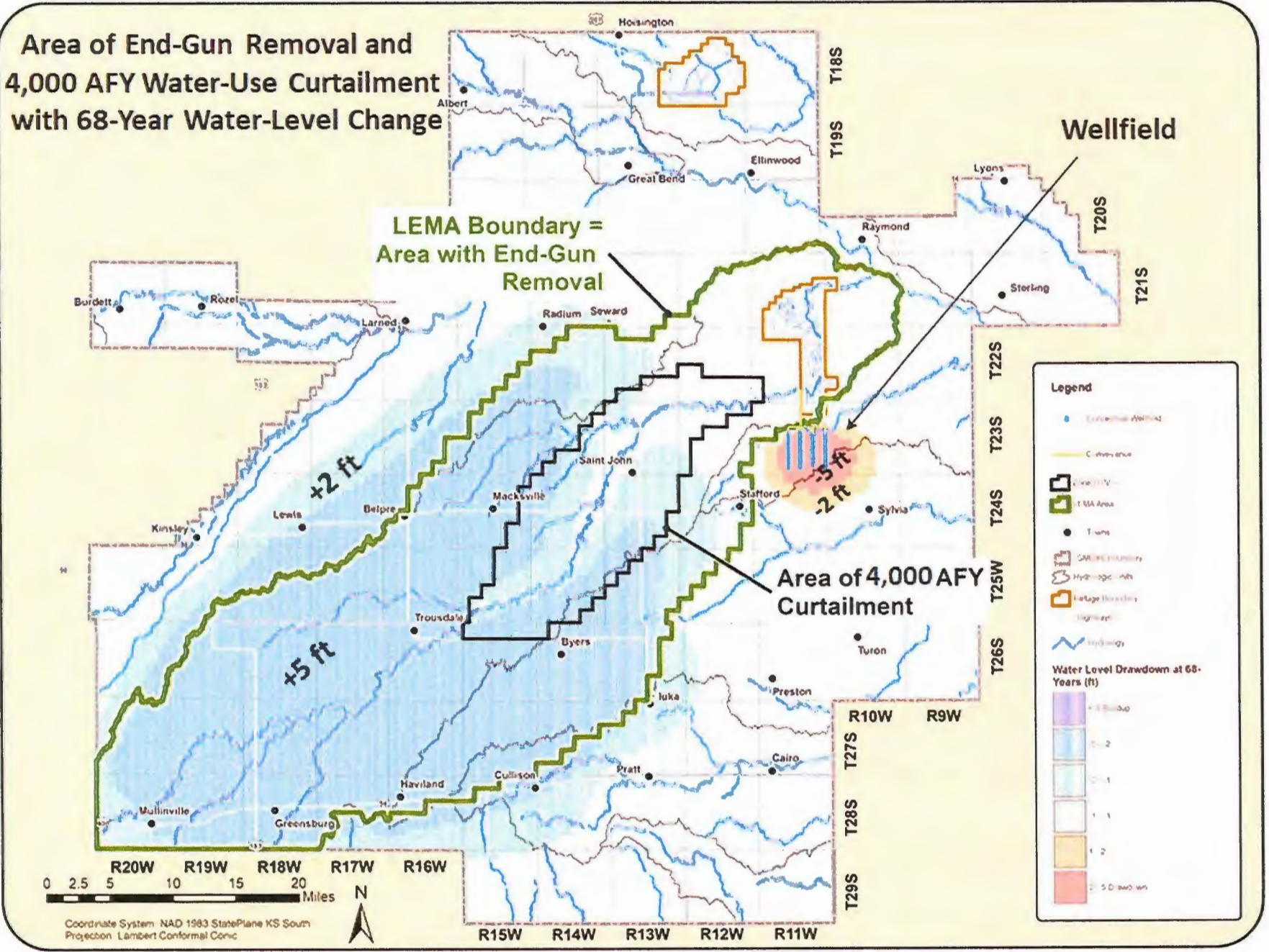
Date: 2/14/2018

Attachment 4

The augmentation well field implementation schedule is being refined currently.



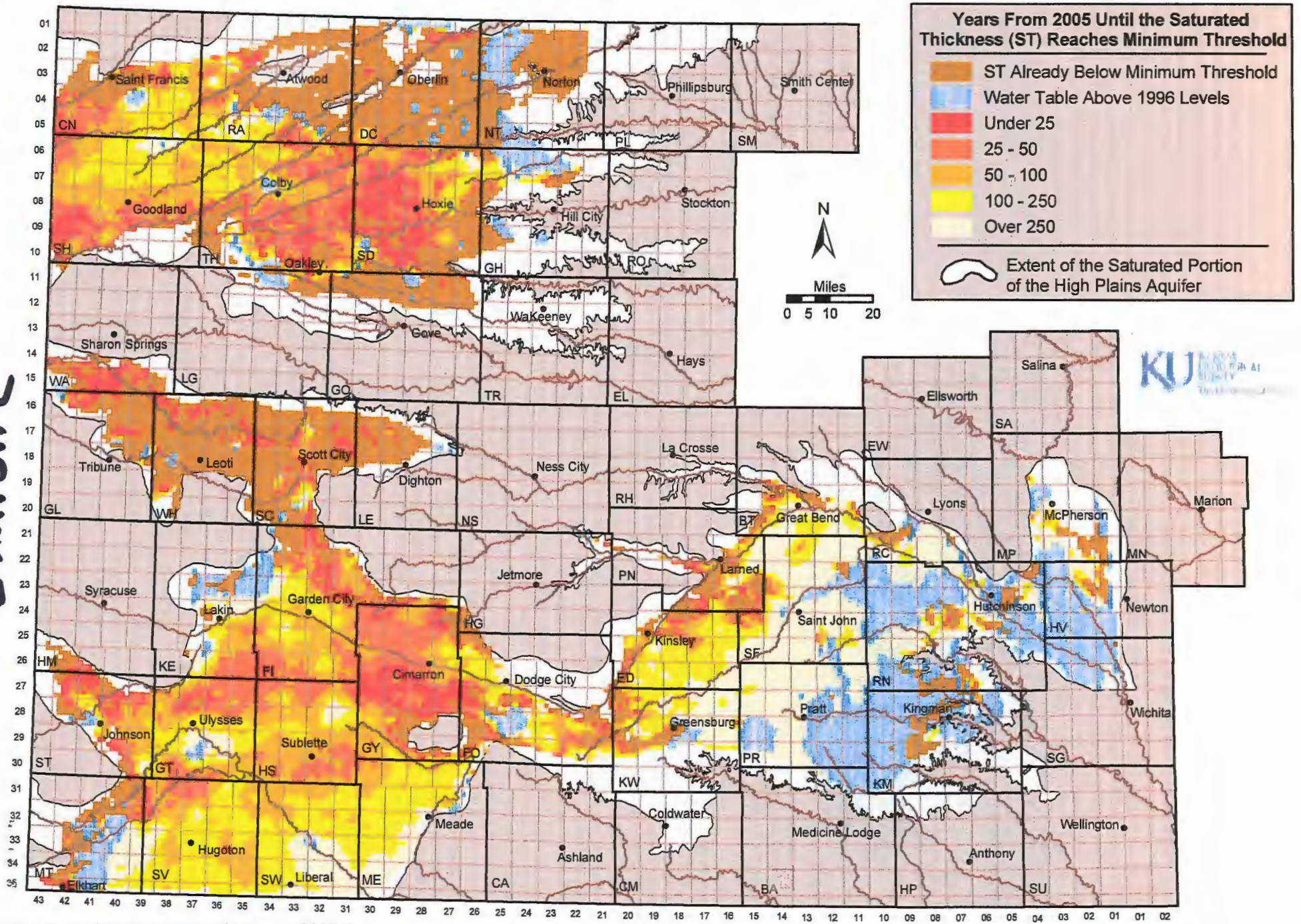
Area of End-Gun Removal and 4,000 AFY Water-Use Curtailment with 68-Year Water-Level Change



Estimated Usable Lifetime for the High Plains Aquifer in Kansas

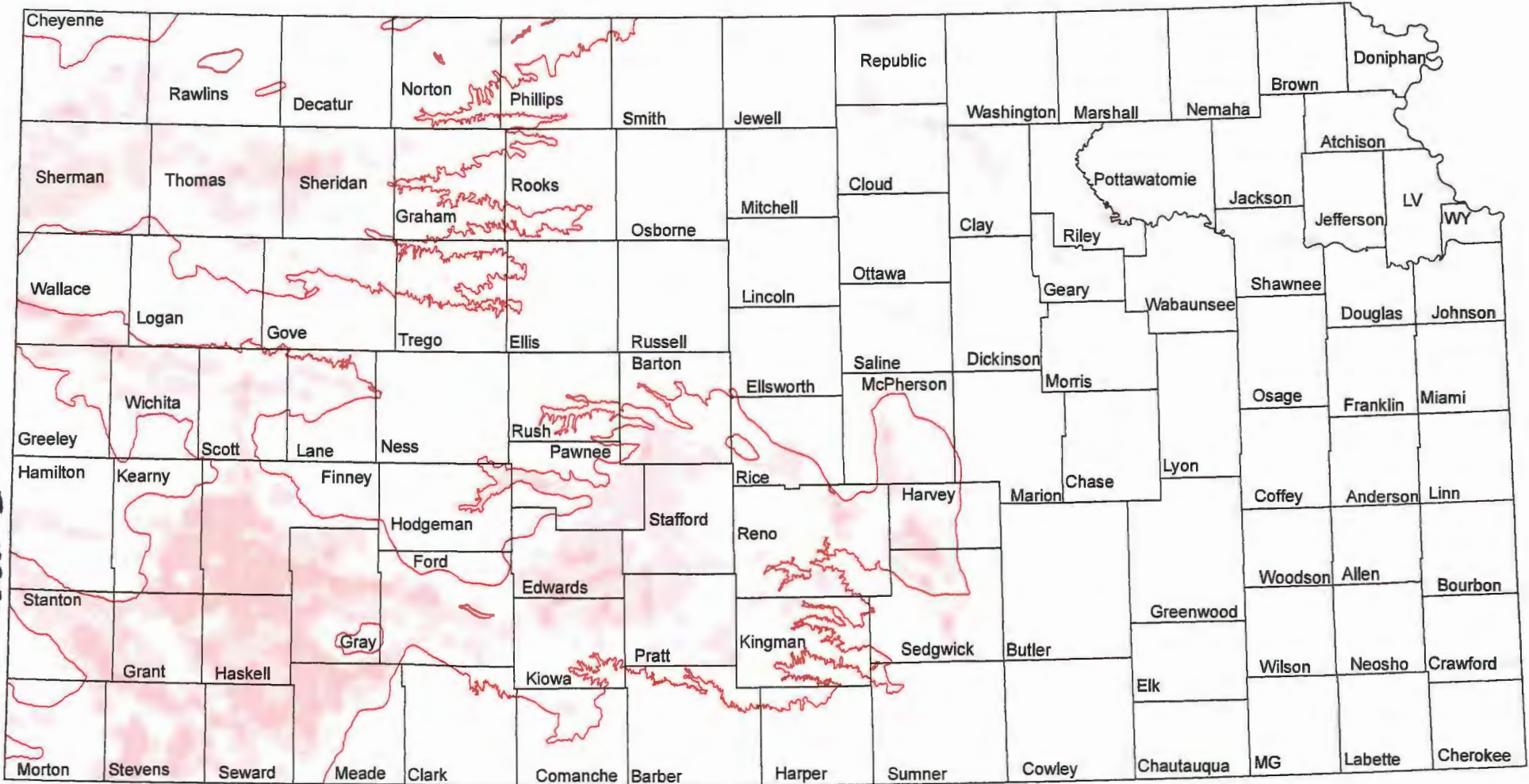
(Based on ground water trends from 1996 to 2006 and the minimum saturated thickness required to support well yields at 400 gpm under a scenario of 90 days of pumping with wells on 1/4 section)

Exhibit 2



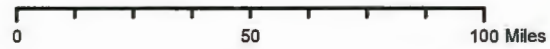
Groundwater Use Density

Average 2003-2012 reported water use per square mile averaged over a 2-mile radius and summarized by section



Groundwater use density (Acre-feet per square mile)

- 0 - 50
- 51 - 100
- 101 - 250
- 251 - 500
- 501 - 3000
- High Plains Aquifer



Kansas Department of Agriculture
Division of Water Resources
February 16, 2016

Exhibit 3