Testimony of the Northwest Kansas Groundwater Management District No. 4 (GMD 4) to Hearing Officer Earl Lewis, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture

RE: Supplement to the Preceding Written Testimony and Record provided for the GMD 4 Local Enhanced Management Area (LEMA) at the hearings of August 23, 2017, and November 14, 2017

Presented by: Shannon Kenyon

This written testimony is from the Northwest Kansas Groundwater Management District No. 4. It supplements the Testimony and Record provided by the Northwest Kansas Groundwater Management District No. 4 to Hearing Officer Connie Owen, appointed by David Barfield, Division of Water Resources, Kansas Department of Agriculture, RE: Proposed District-Wide Local Enhanced Management Area (LEMA) for the August 23, 2017, initial hearing and the Written Testimony and Record Provided to Chief Engineer Barfield at the hearing of November, 14, 2017. The District's Testimony, both by Raymond Luhman, is attached as Exhibits 1 and 2. It also supports the written testimony recorded and revised to Chief Engineer Lewis on July 27th, 2022.

Note on terminology: In 2017, GMD 4 proposed a District-Wide LEMA. Through action of the Chief Engineer, townships whose rate of decline were less than 0.5 feet per year were excluded from the final, approved LEMA Plan. Herein, the LEMA is generally referred to as the GMD 4 LEMA.

Background

The creation of the GMD 4 LEMA

On June 8, 2017, the Northwest Kansas Groundwater Management District No. 4 Board submitted a LEMA proposal for the entire District to the Chief Engineer to reduce decline rates and thereby extend the life of the aquifer in Northwest Kansas.

On June 27, 2017, the Chief Engineer found the LEMA Plan acceptable for consideration, and initiated proceedings. He delegated the initial hearing to Hearing Officer Constance Owen.

On August 23, 2017, Constance Owen conducted the initial hearing and on September 23, 2017, Ms. Owen issued her Initial Order concluding that the Proposal "satisfied the three initial requirements for approval as set forth in K.S.A. 82a-1041(b)(1)-(3)."

More details related to her findings and their basis are provided in the District's testimony of August 23, 2017, and Ms. Owens' Order.

Chief Engineer David W. Barfield set the second hearing for the LEMA's consideration for November 14, 2017. On October 10, 2017, after notice of the hearing was provided to all effected waterusers, but before the second hearing, a group of intervenors sought to postpone the hearing and requested additional due process considerations for hearing preparation and hearing proceedings. While the hearing was not postponed, several due process requests of the intervenors were granted.

As part of its testimony, GMD 4 requested two modifications to the management plan as submitted to the Chief Engineer. First, for stock water use: rather than require a mandatory reduction, the management plan would encourage adoption of best practices with the goal to use only 90% of authorized quantity. Second, that any conversion of a water right from irrigation to a non-irrigation use be done in accordance with the consumptive use provision in K.A.R. 5-5-9, K.A.R. 5-5-10, or any applicable groundwater management district regulation, and not be subject to the irrigation allocation established by the management plan.

The record of the LEMA hearings is posted on DWR's website dedicated to the GMD 4's Proposed District-wide LEMA at: https://www.agriculture.ks.gov/divisions-programs/dwr/managing-kansas-water-resources/local-enhanced-management-areas/gmd4-district-wide-lema.

After consideration of the extensive record afforded by the hearings, on February 26, 2018, Chief Engineer Barfield issued his order of decision regarding the Proposed LEMA plan. In his Order, he returned the LEMA Management Plan to the District finding the LEMA Plan should be modified as he specifically recommending in his Order. The modifications proposed included the District's two requested changes as well as other changes he believed necessary based on his review of the hearing record. Chief among these were to reduce the geographic extent of the LEMA to include only those townships with a rate of decline greater than 0.5%/year. (see Exhibit 3, Map of the Revised LEMA boundary) and removing water rights in their perfection period from restrictions by the LEMA. Other changes to the Plan required by the Chief Engineer are on pages 29 and 30 of his order.

On March 1, 2018, the GMD4 Board approved the Chief Engineer's proposed changes and returned to the Chief Engineer a modified LEMA Management Plan consistent with these changes.

On April 13, 2018, the Chief Engineer issued his Order of Designation, approving the Modified LEMA Management Plan and putting it in effect in the designated townships.

The approved LEMA was subject to a subsequent Judicial Review, culminating in the October 15, 2019, Memorandum Decision by the Gove County District Court finding the approved LEMA should be upheld.

Re-formulation request

With the Chief Engineer's 2018 Order of Designation, the GMD 4 worked to implement the Order's requirements, in cooperation with the Kansas Department of Agriculture's Division of Water Resources (DWR).

Per the LEMA Plan, a GMD 4 LEMA Advisory Committee was established and met annually to review LEMA implementation including review of available wateruse data, water level data, economic data and to consider potential future modifications to the LEMA. Further, the LEMA Plan required a formal review of the LEMA order 1.5 years before its ending date.

Exhibits 4a and 4b provide the Advisory Committee's 2021 Formal Review as well as its most recent 2022 annual review.

With respect to its 2021 Formal Review, the *Advisory Committee recommended the LEMA be continued on essentially the same terms.* They recommended there be no carryover provision in the re-formulation request and adding a provision to prevent the increase in consumptive use on conversions from irrigation use to other use types.

The GMD 4 Board carefully considered the work of its Advisory Committee. After discussion, the GMD 4 Board developed its revised LEMA Plan included in this request for Re-formulation of the LEMA, with the following changes from the 2018 LEMA Plan (as revised by the Chief Engineer's 2018 Order of Decision):

- Effective years: 2023 to 2027.
- Dropping the 25% restriction on reductions from recent average water in 2017 Plan. This change effects 16 water rights, reducing their allocations by an estimated total of 6,223 acre-feet for the coming 5-year LEMA.
- Adding a new provision: "*The following uses will be deemed "non-irrigation" for the purposes of this LEMA and will be encouraged to use best management practices in the watering of: gardens, orchards, and lawns*

greater than two acres; and golf courses, cemeteries, athletic fields, parks, racetrack grounds, and similar facilities."

- Adding a new provision on conversions from irrigation to other uses: "*The converted water right will then have a LEMA allocation equal to or less than the irrigated LEMA quantity prior to the conversion*".

At its Board meeting of March 2, 2022, the GMD 4 Board unanimously voted to send the Re-formulated LEMA Plan to the Chief Engineer for consideration. As a result, the GMD 4 is requesting the Chief Engineer accept this re-formulation of the GMD 4 LEMA for the years 2023 to 2027. See Exhibit 5.

Process for consideration of the Re-formulation request

The 2022 request to re-formulate the GMD 4 LEMA will be heard in one, consolidated hearing to take place on July 27, 2022. The consolidated hearing will determine:

- Whether one of more of the following circumstances continues to exists:
    - Groundwater levels in the area in question are declining or have declined excessively.
    - The rate of withdrawal of groundwater within the area in question equals or exceeds the rate of recharge in such area.
    - Preventable waste of water is occurring or may occur within the area in question.
    - Unreasonable deterioration of the quality of water is occurring or may occur within the area in question.
- Whether the public interest requires one or more corrective control provision be adopted.
- Whether the geographic boundaries are reasonable.
- Whether the LEMA Management Plan should be accepted, rejected, or returned with suggested modifications to the proposed LEMA.

Evidence showing the GMD 4 LEMA should continue

Does one of more of the following circumstances of K.S.A. 82a-1036 continues to exist in the Proposed LEMA?

The current and proposed LEMA are based on addressing the following concerns:

(a) Groundwater levels in the area in question are declining or have declined excessively;

(b) the rate of withdrawal of groundwater within the area in question equals or exceeds the rate of recharge;

(c) preventable waste of water is occurring or may occur within the area; and

(d) unreasonable deterioration of the quality of water is occurring or may occur.

To supplement the record of the 2017 hearing supporting the existence of these concerns, attached is Exhibit 6 from the Kansas Geological Survey (KGS).

Exhibit 6 provides the latest detailed GMD 4 maps from the KGS including:

- Estimated Change in Saturated Thickness, Predevelopment to Average 2020-2022, of the High Plains Aquifer in Northwestern Kansas GMD No. 4,
- Estimated Percent Change in Saturated Thickness, Predevelopment to Average 2020-2022, of the High Plains Aquifer in Northwestern Kansas GMD No. 4, and
- Estimated Average 2020-2022 Saturated Thickness of the High Plains Aquifer in Northwestern Kansas GMD No. 4.

The District's groundwater model, recently developed by the Kansas Geological Survey based on the best available data and science, also supports the contention that use exceeds recharge within the LEMA. GMD4 Groundwater Flow Model, Kansas Geological Survey Open-File Report 2021-6. Exhibit 7 provides excerpts from the full model report summarizing results from a "Status Quo" future model run, which demonstrates the on-going declines into the future without reductions in groundwater pumping. Figure 74 then shows the future model run with the proposed GMD 4 LEMA in place. The differences in feet between "Status Quo" and GMD 4 LEMA remaining in affect is included.

This additional data and analysis supports the District's conclusion that one or more of the K.S.A. 82a-1036 conditions exist, particularly related to groundwater levels continuing to decline.

Whether the public interest requires one or more corrective control provision be adopted?

As the Proposed re-formulated LEMA continues with essentially the same goals and corrective controls as the current LEMA. *See* evidence provided in the District's Testimony and Record provided to the 2017 hearings as well as the findings and conclusions of the Hearing Officer Owen and Chief Engineer in their respective orders.

Whether the geographic boundaries are reasonable?

The boundary of the proposed re-formulated LEMA area consistent with Chief Engineer Barfield's order of decision with respect to this LEMA.

For more on the basis of the boundary, principally the determination of townships with greater than 0.5 feet/year of average decline, see the evidence provided in the District's Testimony and Record provided to the 2017 hearings as well as the findings and conclusions of the Hearing Officer Owen and Chief Engineer in their respective orders.

The Re-formulation request continues the current, well vetted, LEMA provisions

The current GMD 4 LEMA request adopts the goal statement and its justification from the 2017 LEMA request submitted by the GMD 4 Board of Directors as well as substantially the same corrective controls in its fourteen implementable elements designed to achieve that goal.

The 2017 LEMA proposal was the product of a substantial amount of public outreach and input as is discussed in detail in the District's 2017 "Memorandum in Support of the Chief Engineer Approving the Groundwater Management District No. 4's Proposal as requested to be Modified and Designating a Local Enhanced Management Area."

This Plan, via the GMD Act's LEMA statutory provisions was vetted through a comprehensive review including the Chief Engineer's initial review to determine if the Plan was "acceptable for consideration," as well as two public hearings. This

process and its record was enhanced through the additional procedures enacted by the Chief Engineer as a result of the Intervenor's requests. Finally, as is noted above, LEMA Plan's was subject to a judicial review that found the LEMA Plan should be upheld and that "there is substantial evidence backing the agency's decision.

The Proposed LEMA Plan continues the same allocation method as the current LEMA plan documented in the 2017 proceedings, which requires more restrictive allocations in townships with greater rates of groundwater decline and less restrictive allocations in townships with lesser rates of groundwater decline.

Data evidencing it is premature to consider changes to the LEMA.

The allocations of the current and proposed Re-formulated LEMA are based on rates of groundwater level decline by township, as presented in the record of the 2017 hearing. At the time of Advisory Committee made its formal review and recommendations regarding re-formulation of the LEMA (May 2021), the principle available records were wateruse through 2019 and water level change data through early 2021 (preliminary). As is noted above, the Advisory Committee believed this additional record was insufficient to warrant changes in the township designations and allocations.

Attached in Exhibit 8 is the latest updates to the KGS's on-going work to evaluate precipitation, pumping, and water level change relationships, through 2021. Of note are the following:

- The first diagram plots of 2005-2021 irrigation water use, irrigated area, irrigation depth and irrigation season precipitation in inches. For 2017 to 2019, the seasonal precipitation was significantly higher than average, along with the low pumping values for the same years. 2020 and 2021 irrigation season precipitation are lower than average with a significant increase in pumping.
- The second diagram shows another look at this same data with years 2017 to 2019 as the extreme values in terms of precipitation (high) and pumping (low).

Index well data.

In addition to the on-going monitoring of the Ogallala-High Plains monitoring network annually measured by the KGS and DWR as reflected in the maps of Exhibit 9, the KGS continues and expends its Index Well network. Exhibit 10 attached provides the latest published results for the index wells withing GMD 4.

The full report is available at: https://www.kgs.ku.edu/Publications/OFR/2021/OFR2021-8.pdf

The LEMA's Corrective Controls are accomplishing the LEMA's Goal and can be expected to do so in the future.

As is noted above, the goal of the LEMA, limiting irrigation wateruse within the LEMA boundary to 1.7 million acre-feet over the 5-year LEMA period remains unchanged. The District's Testimony and Record from the 2017 proceedings provides a description of the LEMA's method for determining allocations, which remain unchanged except for the minor changes noted above.

Based on wateruse data provided by DWR on July 22, 2022, which included interim wateruse data from 2021, the total wateruse within the LEMA boundary for the first four years of the LEMA, 2018-2021, was estimated 1.00 million acre-feet, 59.0% of the allowable 1.7 million acre-feet for 5 years, well below the 80% that might be expected after four years. Even given this current dry year, there is little doubt the LEMA will easily meet its goal.

While this data is far from conclusive, there is reason to hope that, like the SD-6 LEMA, this LEMA will result in water use reductions in excess of its required reductions as it encourages waterusers to take a multi-year approach to irrigation management and creates an atmosphere which fosters joint action to reduce wateruse.

In addition to the overall water savings goal of the LEMA Plan, as noted above, the Plan focuses its strongest action in areas of greatest declines. On this point, in its groundwater modeling, the KGS also developed a model run based on the LEMA plan's implementation, assuming full use of its allocations. The KGS concluded: "Figure 75 shows the simulated head changes at selected intervals for the districtwide LEMA scenario. Most of the district will continue to see varying levels of water-level declines. However, even with the relatively small reductions in pumping, because the districtwide LEMA is focused on townships that have already shown relatively greater past levels of declines, future declines are noticeably less in those targeted areas."

Economic matters

While no specific economic data is available related to the GMD 4 LEMA, the findings related to the studies of SD-6 LEMA provide ample evidence that

producers can make the needed adjustments to continue to irrigation within this LEMA's less restrictive allocation framework.

The Golden Final Report of November 15, 2018, supports this statement with the following amount its conclusions:

> "*The economic results are consistent with Golden and Leatherman (2017) and suggests that, given the certainty of groundwater use reductions, producers are able to implement strategies to maintain returns and apply less groundwater. Additional research on the risk associated with reduced groundwater use is needed. The producer-supplied data suggests that producers within the LEMA boundary have been able to reduce groundwater use with minimal impact on cash flow. While we can observe the changes in crop mix and water use, we cannot discern, at this point, exact strategies producers are using to reduce variable expenses and/or adjust cultural practices.*
>
> *On February 17, 2017, GMD 4, at the request of producers in the Sheridan #6 LEMA, submitted a request to the Division of Water Resources to extend the Sheridan #6 LEMA. On August 24, 2017, the Chief Engineer accepted the extension proposal for the period 2018-2022. This suggests that producers within the Sheridan #6 LEMA believe they can mitigate any negative economic consequences associated with reduced groundwater use and that the benefits of groundwater conservation outweigh the costs.*"

Metering and Enforcement

The metering and enforcement policies have worked very well and there is no request to change the enforcement policies. Several well meters failed and the water users and GMD 4 worked together under normal procedures to see that the meters were replaced and to estimate wateruse. Therefore, the policies allowed for a swift response to meter failures and provide penalties sufficient to encourage compliance. Most water users adopted alternate means to monitor their meters and GMD 4 has found few problems to date.

Advisory Committee

The Advisory Committee has worked well, and it should be continued in its current form. The advisory committee meets yearly, has produced yearly reports (see e.g.

Exhibits 4a and 4b), and has encouraged GMD 4 and stakeholders to work towards communication regarding the GMD 4 LEMA status. The request for re-formation was done at the Advisory Committee's request to the GMD 4 Board of Directors.

Reporting

If the GMD 4 LEMA is approved to be continued GMD 4 requests DWR again provide notice to all well owners of their 2023-2027 allocations prior to the start of the 2023 pumping season.

Conclusion

In closing, the GMD 4 Board offers a proposal to re-formulate the GMD 4 LEMA for 2023-2027 which:

1. Reduces the historical water use by a significant amount and will achieve the LEMA goal of no more than 1.7 million acre-feet pumped for irrigation use within the LEMA area during the LEMA period.

2. Does not disadvantage the less used water rights or benefit the highest used water rights.

3. Allows maximum economic use of the total goal quantity chosen.

4. Includes a monitoring and enforcement element that is sufficient to thwart violations.

5. Is consistent with Kansas water law.

6. Meets all the requirements of K.S.A. 82a-1040 et seq.

Therefore, this re-formation should be approved and implemented as requested

Exhibit 1

Testimony of the Northwest Kansas Groundwater Management District No. 4 (GMD 4) to Hearing Officer Connie Owen, Appointed by David Barfield, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

RE: Written Testimony for Proposed District-Wide LEMA of August 23, 2017

Presented by: Raymond Luhman

This written testimony is from the Northwest Kansas Groundwater Management District No. 4 regarding its District-Wide LEMA Proposal. See attached Exhibit 1. It addresses the following three questions:

1. Whether one or more of the circumstances specified in subsection (a) through (d) of K.S.A. 82a-1036 exist:

2. Whether the public interest of K.S.A. 82a-1020 requires one or more corrective control provisions.

3. Whether the geographic boundaries are reasonable.

Testimony

1. Whether one or more of the circumstances specified in subsection (a) through (d) of K.S.A. 82a-1036 exist:

These circumstances are:

(a) Groundwater levels in the area in question are declining or have declined excessively;

(b) the rate of withdrawal of groundwater within the area in question equals or exceeds the rate of recharge;

(c) preventable waste of water is occurring or may occur within the area; and

(d) unreasonable deterioration of the quality of water is occurring or may occur.

Groundwater levels in GMD 4 are declining or have declined excessively. Townships used in the calculations, which were based on KGS section level data, have at least 15 feet of saturated thickness. In the GMD 4 areas marked as red, yellow, and purple (see attached map in district request exhibit 1) there is at least a 0.5 % annual decline in the

water table over an eleven year period. Therefore, groundwater levels are declining excessively in those areas. Townships exhibiting less than 0.5 % decline rate have no restrictions proposed, only additional monitoring enforcement criteria.

The rate of withdrawal of groundwater within GMD 4 equals or exceeds the rate of recharge. Specifically, Kansas Geological Survey data estimates district-wide recharge at 126,910 acre-feet (AF) to 160,320 AF. See attached Exhibit 1.1. District-wide water rights have been allocated 848,500 AF per year being allowed to pump. See attached Exhibit 1.1. District-wide yearly pumpage amounts ranged from 307,051 AF to 539,567 AF from 2009 – 2015. See attached Exhibit 1.1. Therefore, there was between an excess of 688,180 and 721,590 AF water allocated than recharged; and, between 146,731 and 412,657 AF of water pumped than recharged from 2009 – 2015.

2. Whether the public interest of K.S.A. 82a-1020 requires one or more corrective control provisions.

K.S.A. 82a-1020 is the Legislative declaration relative to establishing groundwater management districts in Kansas. It declares that in the public interest it is necessary and advisable to permit the establishment of GMDs which allow local water users to determine their own destiny with respect to the use of groundwater - - insofar as that destiny does not conflict with the basic laws and policies of the state.

So long as the LEMA process comes from the local board of directors, and whatever corrective control provisions are requested out of that process are consistent with state law, then GMD 4 contends that the public interest of K.S.A. 82a-1020 has been satisfied.

The GMD 4 District-Wide LEMA process took 2 public meetings and multiple GMD 4 Board meetings with many interested people attending, between January 2015 and June 2017. This represents significant public involvement in the process that resulted in the locally developed and locally requested plan that the chief engineer is hearing today.

Also, during the process the GMD 4 annual meeting occurred. At that meeting, three board of director's seats were up for election. One seat was an unchallenged race. The other two seats had challengers. Each seat had a candidate that supported the District Wide LEMA and one that opposed the District Wide LEMA. The candidates supporting the District Wide LEMA were voted into office receiving in excess of 60% of the votes. See attached Exhibit 2.1.

In any event, the GMD 4 provided GMD 4 water users information very early in the discussions of the District Wide LEMA. The evidence provided the water users showed

that adopting and implementing any corrective control provisions that would reduce water use, would also extend the life of the regional aquifer.

A web page was created to keep the process available to the public and was updated regularly by GMD 4 staff. Beginning in January of 2015, the process was covered by at least 28 board meetings.

3. Whether the geographic boundaries are reasonable.

The proposed LEMA has very definite boundaries, those boundaries being the entire area of GMD 4. See attached Exhibit 1.

On December 19, 1974, after a series of informal meetings were held in the GMD 4 area to sense the will of the people relative to forming a GMD, a steering committee filed a declaration of intent and a map of the proposed district boundaries with Kansas' Chief Engineer. After further discussions between the steering committee, the Division of Water Resources, and the Chief Engineer, the Chief Engineer certified a final description of the district boundaries.

In 1975, the water users voted in favor of creating GMD 4. On May 24, 1976, the initial meeting was held in Colby, Kansas. 11 positions were opened for election and all the positions were filled. GMD 4 was established.

Now, those same boundaries contemplated in 1974 and adopted in 1976 are being used to establish further water conservation measures.

Within the larger boundaries of the District, there are sub-boundaries. These boundaries are each township within the district. Each township was analyzed for its respective annual decline rate from 2004 – 2015 using KGS section level data. Based on this decline rate, various restrictions in pumping are proposed.

These restrictions are based on "zoned" values for the District; the "zoned" valued being based on the Natural Resource Conservation Services (NRCS) Net Irrigation Requirement (NIR). See U.S. Dept. of Agric., Nat. Res. Cons. Serv., Nat'l Eng'r Handbook, Irrigation Guide, KS210-652-H,, Amend. KS31, KS652-4.1 thru 4.25 (2014), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_030990.pdf. The State of Kansas has used the NIR amounts since at least 1994 and referenced the NIR amounts in K.A.R. 5-5-9, K.A.R. 5-5-10, K.A.R. 5-5-11 and other regulations. The GMD 4 Board used the NRCS NIR 50% and 80% values for corn by county. 50% NIR represents the net irrigation requirement for corn that would be sufficient in 5 out of 10 years (considered to be normal) based on the precipitation that would be expected in 5

out of 10 years. 80% NIR represents the net irrigation requirement for corn that would be sufficient in 8 out of 10 years (considered to be dry) based on the precipitation that would be expected in 8 out of 10 years. These figures were then interpolated to derive a value at the western edge of each zone. Townships exhibiting greater than a 2% annual decline rate were assigned the 50% NIR for corn by zone. Townships exhibiting from 1% to 2% annual decline rate were assigned the 80% NIR for corn by zone. Townships exhibiting 0.5% to 1% were assigned an 18 inch allocation district-wide. Those townships that are below the 0.5% decline rate will not have restrictions on their diversions imposed. The only provisions of this request that will apply to them are the increased compliance and enforcement. The GMD 4 Board determined the townships with less than 0.5% annual decline appropriate because 75% of the saturated thickness will remain in 50 years. Given the limited five year scope of this proposal, the GMD 4 Board deems such decline rates acceptable for now.

In addition, stockwater rights are proposed to have some restrictions imposed. Livestock and poultry use will be restricted to 76% of the quantity of water deemed to be reasonable for livestock and poultry provided in K.A.R. 5-3-22 in townships with greater than 2% average annual decline and 85% of said amount in townships with average annual declines between 1% and 2%, based on the maximum head supportable by the feedlot permit in effect on December 31, 2015.

In sum, GMD 4 contends that:

3.1. The majority of invested persons were made aware of the process and invited to participate;

3.2. The public had ample time to discuss the issues brought up;

3.3. GMD 4 staff appropriately facilitated the meetings and discussion resulting in a LEMA proposal that has been locally crafted and adopted by the board of directors; and that

3.4. The public interest as envisioned in K.S.A. 82a-1020 will be served by adoption of the corrective control provisions included in the GMD 4 District Wide LEMA.

EXHIBIT 1

Request for a District-Wide LEMA Submitted To the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources

June 9, 2017

In order to reduce decline rates and extend the life of the aquifer in Northwest Kansas Groundwater Management District No. 4 (GMD 4) the Board of Directors of GMD 4 proposes the following five year plan be submitted via the Local Enhanced Management Area (LEMA) process contained in KSA 82a-1041 for the entire area within the boundary of the Northwest Kansas Groundwater Management District No. 4.

Overview and Goal Expression

To promote improved management of water used district-wide with a goal not to exceed 1.7 million acre-feet (AF) for irrigation over five years within townships displaying an annual decline rate for the period 2004 – 2015 of 0.5% or greater annual decline and promote more efficient use by non-irrigation uses.

This LEMA shall exist only for the five- year period beginning January 1, 2018 and ending December 31, 2022. The proposed LEMA shall include all points of diversion located within the boundaries of GMD 4 excluding vested rights and points of diversion whose source of supply is 100% alluvial.

The total program diversion amount of 1.7 million AF for irrigation use for townships with annual decline rates of 0.5% or greater shall represent five (5) times the sum of designated legally eligible acres times the amount designated for irrigation water rights;

The Northwest Kansas Groundwater Management District No. 4 shall use the procedures herein to determine the 5-year allocation for each water right, and specify said values in Section 3). All allocation values shall be expressed in terms of total acrefeet for the five-year LEMA period.

1) Allocations – Irrigation

a) Proposed allocations provided in Sections 3 and 4 were determined based on the maximum reported and/or verified acres for years 2009-2015. Proposed allocations are subject to change in the case where incorrect water use data is verified via the process in Sections 5 and 6.

b) All irrigation water rights, excluding vested rights, shall be limited to the allocation for the water right location on the accompanying map over the 5-year period beginning January 1, 2018 and ending December 31, 2022. If a vested right and an appropriation right have the same place of use or same point of diversion, the vested right will be the vested water right's authorized quantity and the appropriation right will be limited to the total system allocation minus the vested water right's authorized allocation.

c) The base water rights will not be altered by any Order issued under this request, but will be subject to the additional terms and conditions described herein for the duration of the LEMA.

d) Wells pumping to a common system or systems shall be provided a single allocation for the total system acres, subject to the review process in Sections 5 and 6. The total amount pumped by all of the wells involved must remain within the system allocation.

d) No water right shall receive more than the currently authorized quantity for that right, times five (5).

e) No water right within a K.A.R. 5-5-11, 5-year allocation status shall receive an allocation that exceeds its current 5-year allocation limit.

f) No water right shall be allowed to pump more than its authorized annual quantity in any single year.

g) In all cases the allocation shall be assigned to the point of diversion and shall apply to all water rights and acres involving that point of diversion. Moreover, in all cases the original water right shall be retained.

h) For water rights enrolled in EQIP and/or AWEP that will be coming out of either program on or before September 30, 2022, the allocation quantity shall be set at the annual allocation for only the remaining years of the 2018-2022 LEMA period.

i) If a water right is or has been suspended, or limited for any year of this LEMA, due to penalty issued by the Kansas Department of Agriculture, Division of Water Resources (DWR), then the GMD 4 and DWR will reduce the allocated quantity for such water right accordingly for the 2018-2022 LEMA period.

j) For water rights enrolled in a KAR 5-5-11 change, MYFA, WCA, or other flexible water plan, the most water restrictive plan will apply.

k) No water right shall be reduced by more than 25% of their average historical pumping based on years pumped 2009-2015 unless it would allow a quantity over 18 inches per acre to be pumped.

l) Should GMD 4 request a new LEMA beyond the first five-year period, the GMD 4 Board will consider a maximum 10% carry-over of the LEMA allocation for the regions depicted in the purple, yellow, and red on Attachment 1 if a new district-wide LEMA is considered or pursued as a result of the LEMA Order Review discussed in Section 11.

2) Allocations – Non-irrigation

a) Livestock and poultry use will be restricted to 76% of the quantity of water deemed to be reasonable for livestock and poultry provided in K.A.R. 5-3-22 in townships with greater than 2% average annual decline and 85% of said amount in townships with average annual declines between 1% and 2%, based on the maximum head supportable by the feedlot permit in effect on December 31, 2015. At no time will a stockwater right be authorized to pump more than its authorized quantity.

b) Municipal will be encouraged to reduce the amount of unaccounted for water reported annually on the water use report and reduce the gallons per capita per day.

c) All other non-irrigation users will utilize best management practices.

d) When converting irrigation to non-irrigation, then the most restrictive of the LEMA allocation, GMD 4 regulations, or conversion outlined in K.A.R. 5-5-9 will be used to determine the converted allocation amount.

e) The base water rights will not be altered by any Order issued under this request, but will be subject to the additional terms and conditions described herein for the duration of the LEMA.

3) Individual Allocation Amounts

The five-year allocations for every water right per Sections 1.a and 2 above shall be converted to a five-year acre-feet total, with Attachment 1 containing the assigned eligible irrigation restriction for each township. Each water right will be restricted to its total acre-feet allocation within the LEMA order issued through this process, subject to the review processes outlined in Sections 5 and 6.

4) Data Set

The relevant data for this LEMA proposal came from the Water Rights Information System (WRIS) maintained by the Kansas Department of Agriculture, Division of Water Resources (DWR).

If any data errors are discovered, then the GMD 4 Board requests that the person or entity discovering the errors contact GMD 4 to update or correct any alleged errors via the processes outlined in Sections 5 and 6.

Attachment 2 contains pdf files of irrigation and stockwater water right numbers and allocations. Associated spreadsheets will be kept by GMD 4 and DWR; will be available on the GMD 4 and DWR websites; and may be changed with the Chief Engineer's approval or through the processes outline in Section 5 and 6. The GMD 4 and the DWR will document or track any changes made to the irrigation water and stock water right allocations attached hereto.

5) Eligible Acres Process

Based on input from stakeholders, it was agreed that the following procedure would be used to assign eligible acres to every irrigation water right in the District-Wide LEMA and to include in any future LEMA request.

The GMD 4 and DWR determined eligible acres as follows:

a) The GMD 4 and DWR used the maximum reported authorized irrigated acres from 2009-2015 that could be verified as being legally irrigated with the GMD 4 in-house aerial photography and water right file information.

b) If the authorized place of use was not irrigated from January 1, 2009 to December 31, 2015, then earlier years that the water user irrigated the acres may be considered.

c) The DWR will contact every water right owner within 60 days after the Order of Designation and others known to them as operators or interest holders in the water right to inform them of the eligible acres assigned to their water right(s) under the adopted process, allow them the opportunity to appeal the assigned acres under the process described below and allow them the opportunity to provide more information to the GMD 4 Board on the correct acres. The GMD 4 Board's decision is final and the eligible acres determined by the GMD 4 Board will be used to calculate and assign the final allocations.

6) Appeals Process

a) Appeal Process. The following process will govern appeals regarding eligible acres and allocated water:

(1) Any appeal of the eligible acres and allocated water must be filed before March 1, 2019. Failure to file an appeal of the eligible acres and allocated water by March 1, 2019 will cause the assigned eligible acres and allocated water to become final during the LEMA period.

(2) Only eligible acres and allocated water may be appealed through this appeal process. No other issues including, but not limited to, the LEMA boundaries, violations, meter issues, etc., may be appealed through this process.
(3) Any appeal will first be heard by the GMD 4 staff who will determine eligible acres based on the factors above in Section 5) Eligible Acre Process.
(4) Any determination made by the GMD 4 staff may be appealed to the GMD 4 Board.
(5) The GMD 4 and DWR will use the acres and allocated water determined through the processes contained in Sections 5 and 6, as detailed above, to calculate and assign allocations.

b) Factors to be considered by the GMD 4 Board on appeal. The following factors, in order of importance, will be used when reviewing a determination of eligible acres and allocated water on appeal.

(1) First, the reviewer will first consider the location of the well(s) and their township allocations.
(2) Second, the reviewer may consider the authorized place of use.
(3) Third, the reviewer may consider any and all aspects of the water right, use, place of use, point of diversion, or any other factors the reviewer determines appropriate to determine eligible acres and allocated water.

7) 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 GMD 4 on its effective date.

b) Upon GMD 4 learning of an alleged violation, GMD 4 will provide DWR with the information GMD 4 believes shows the alleged violation. DWR, under its discretion, may investigate and impose restrictions and fines as described below or allowed by law.

c) DWR will address violations of the authorized quantities as follows:

(1) Exceeding any total allocation quantity of less than 4 AF within the allocation period will result in a $1,000.00 fine for every day the allocation was exceeded.

(2) 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.

d) In addition to other authorized enforcement procedures, if the GMD 4 Board finds by a preponderance of evidence that 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 GMD 4 Board will make a recommendation to the Chief Engineer that a written order be issued which states:

(1) The nature of the violation;
(2) The factual basis for the violation;
(3) That the water right is suspended for 5 years; and
(4) That the water right loses all remaining assigned quantities under the District-Wide Local Enhanced Management Area.

8) Metering

a) All water right owners shall be responsible for ensuring their meters are in compliance with state and local law(s). In addition to being in compliance and reporting annually the quantity of water diverted from each point of diversion, all water right owners shall implement at least one of the following additional well/meter monitoring procedures:

(1) Inspect, read and record the flow meter at least every two weeks the well is operating. The records of this inspection procedure shall be maintained by the well owner and provided to the district upon request. Should the flow meter reported readings be in question and the bi-weekly records not be available and provided upon request of the district, the well shall be assumed to have pumped its full annual authorized quantity for the year in question. Following each year's irrigation season, the person or persons responsible for this data may at their discretion transfer the recorded data to the district for inclusion in the appropriate water right file for future maintenance.

(2) 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 GMD 4 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:

(1) water right file number;

(2) legal description of the well;

(3) date the problem was discovered;

(4) flow meter model, make, registering units and serial number;

(5) the meter reading on the date discovered;

(6) description of the problem;

(7) 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; and

(8) the projected date that the meter will be repaired or replaced.

(9) Any other information requested by the GMD 4 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.

9) Accounting

a) DWR, in cooperation with GMD 4, shall keep records of the annual diversion amounts for each Water Right within the LEMA area, and the total 5-year quantity balances will make this information available to the Water Right Holder and the GMD 4 on their request.

10) Advisory Committee

a) A District-Wide LEMA Advisory Committee shall be appointed and maintained by the GMD 4 Board consisting of fourteen (14) members as follows: one (1) GMD 4 staff; one (1) GMD 4 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 irrigators with regional distribution identical to GMD 4 board member distribution. One of the District-Wide LEMA members shall chair the committee whose direction shall be set to further organize and meet annually to consider:

(1) water use data;

(2) water table information;

(3) economic data as is available;

(4) violations issues – specifically metered data;

(5) any new and preferable enhanced management authorities become available;

(6) other items deemed pertinent to the advisory committee.

b) The advisory committee in conjunction with DWR shall produce an annual report which shall provide a status for considerations (1) through (6) and any recommended modifications to the current LEMA Order relative to these six items. Said report shall be forwarded to the GMD 4 board and the chief engineer.

11) LEMA Order Reviews

a) In addition to the annual LEMA Order reviews per Section 10 the District-Wide LEMA Advisory Committee shall also conduct a more formal LEMA Order review 1.5 years before the ending date of the LEMA Order. Review items will focus on economic impacts to the LEMA area and the local public interest. Water level data may be reviewed.

b) The committee, in conjunction with DWR and GMD 4, shall also produce a report following this review to the chief engineer and the GMD 4 board which contains specific recommendations regarding

future LEMA actions. All recommendations shall be supported by reports, data, testimonials, affidavits or other information of record.

12) Impairment Complaints

While this program is being undertaken, the GMD 4 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.

13) Water Level Monitoring

The data used to determine regional aquifer declines in Attachment 1are based on the annual water level monitoring taken by KGS and DWR. Those measurements will continue as the data set used in determining water level declines. In the future, GMD 4 could, but is under no obligation, install additional monitoring wells.

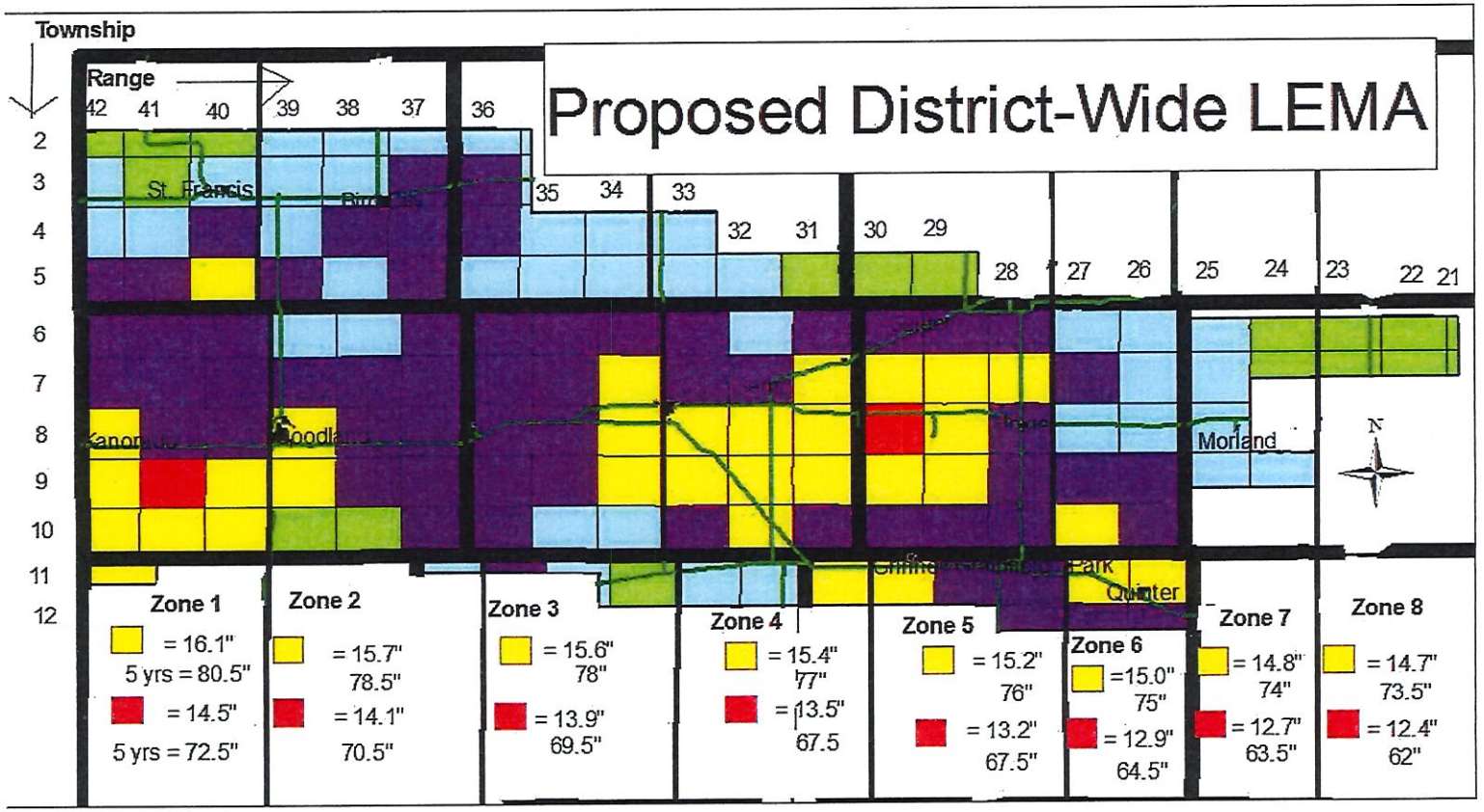
14) Coordination

The GMD 4 stakeholders and the GMD 4 board expect reasonable coordination between the chief engineer's office and the GMD 4 board on at least the following efforts:

a) Development of the LEMA Order resulting from the LEMA process;
b) Accounting for annual pumpage amounts by LEMA water right owners/operators.
c) Compliance and enforcement of the District-Wide LEMA Order.

Attachment 1

Proposed District-Wide LEMA



Townships with 2%+ Average Annual Decline in 2004-2015

Townships with 1-2% Average Annual Decline in 2004-2015

Townships with 0.5 - 1% Average Annual Decline in 2004-2015 (18 inch max restriction)

Townships with 0-.5% Average Annual Decline in 2004-2015

Townships with no decline 2004-2015

Prepared by Shannon Kenyon GMD 4

Attachment 2

Irrigation and Stockwater Allocation PDF Files

GMD 4 LEMA
Irrigation Water Right

GMD 4 LEMA Stock
Water Rights.pdf

Attachment 3

Public Meeting Notes and Sign-in Sheets

PUBLIC LEMA BOARD MEETINGS QUESTIONS AND COMMENTS

COLBY (97 signed in)

Questions:

Is this a 5 yr. program?

What about restricting dairies?

We used to flood and haven't for a while, how will that affect me?

At the end of 5 years are you going to increase or decrease our allocation?

Why would we do this if we're the only district doing it?

Will we get a letter on what we will get under the plan?

Will we be able to bank the water?

Will there be a vote?

How much water is this going to save?

How is this a LEMA? It looks like an IGUCA

Why cut people that don't have a problem ?

What happens in 5 years?

Can we just "knock off" the new wells?

What happens if we do nothing?

Why the whole district?

Public Comments:

0.5 – 1% should also have a reduction.

This plan is a personal agenda.

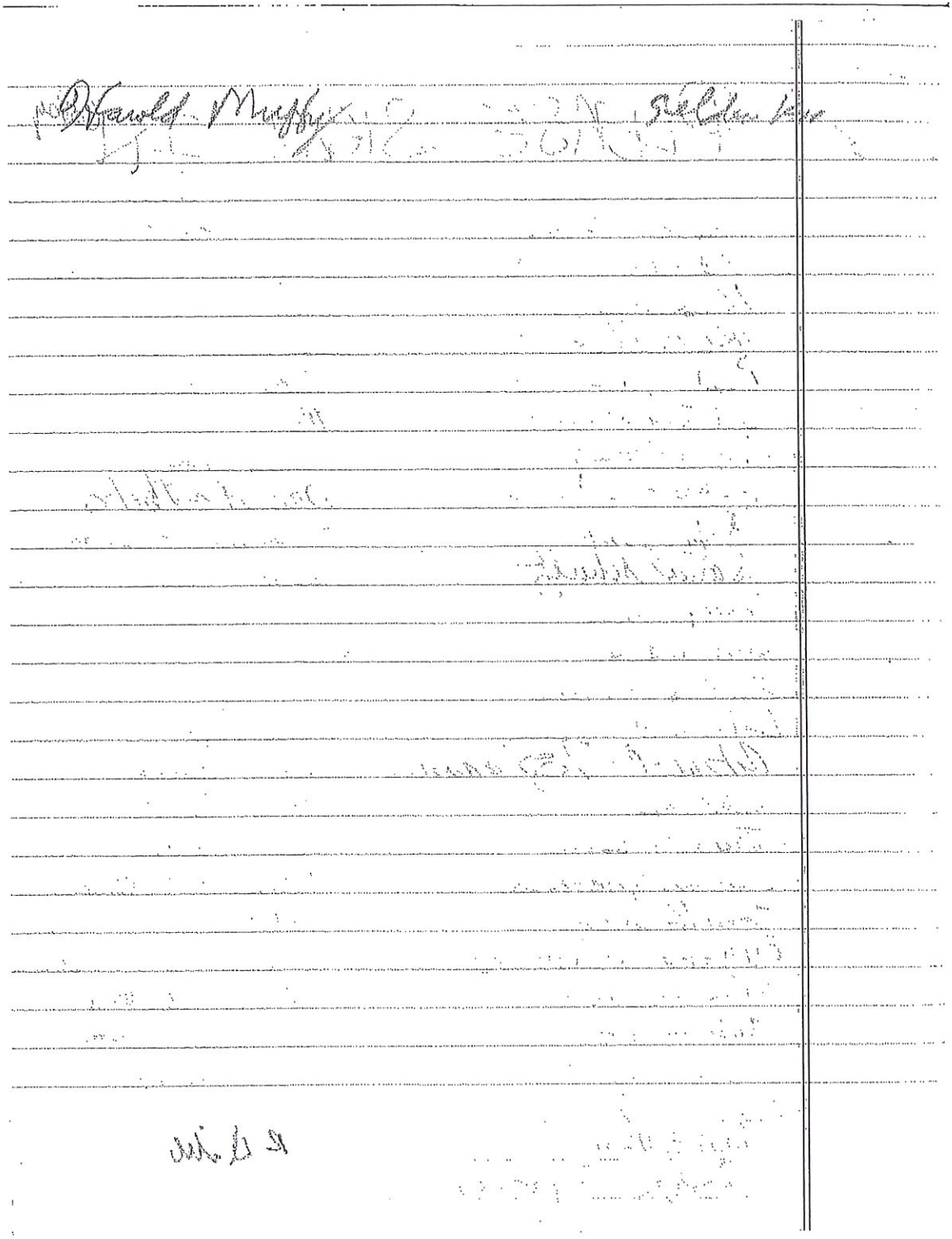
You need more measureable goals.

Data other than KGS should be used.

I've lost nine windmills, how here isn't afraid of the water going away.

PLEASE SIGN IN Colby

Brent Rogers	Conner Wilson
Jerry Binning	Steve Wilson
Norma [illegible]	[illegible]
Kent [illegible]	[illegible]
[illegible]	Ben [illegible]
Phil Keck	Mike Stephens
Carl Ziegelmeier	Michael [illegible]
Chuck [illegible]	Jon Starns
ALAN & Andy Query	Dan Antholz
Jeff Younger	Marvin Albers
Daniel Schultz	Ashley Roehl
Larry Towns	Richard [illegible]
Jim McKee	Ron [illegible]
Kay Christiansen	Steve [illegible]
Curtis Dopp	[illegible]
[illegible]	Mark Myers
[illegible]	Jeremy Myers
Jon Friesen	Jim [illegible]
Jeremy Kersenbrock	Ronald E. Neff
Tom Redmond	Jamie [illegible]
Eugene Schwarz	[illegible]
[illegible]	Alan [illegible]
Todd Ziegelmeier	Dale [illegible]
Shirley Harlett	[illegible]
William [illegible]	[illegible]
Ron Evans	R [illegible]
Steve Friesen	



PLEASE SIGN IN Colby 97

[illegible]	DON WOOFTER
Alex ZERR	Chris Soehner
Sarah Jane Barrett	[illegible]
Dave Hubbard (mult [illegible])	[illegible]
Thad Hahn	Douglas [illegible]
[illegible]	[illegible]
Dale [illegible]	MARSHALL [illegible]
Jim McKee	
Bob Stephens	
[illegible]	
Jeff [illegible]	
Robert [illegible]	
[illegible]	
[illegible]	
[illegible]	
John Flanagin	
Richard [illegible]	
Ron [illegible]	
[illegible]	
Travis Towns	
Kelly Stewart	
Rick Kuper	
Ian [illegible]	
Zach [illegible]	
[illegible]	
[illegible]	

Kelly Hornek Farm Credit

Gloria L Morgan

Mike Baumberger

Jerod Flanigan

Nathan Goetz

Bob Gillen - KSU

Keith Downing (May Ann)

Jim Kopecky

Bernard Meyer

R [illegible]

GOODLAND: (88 signed in)

Questions:

Is the purple 18" per circle?

What about EQIP acres?

Does this apply to vested rights?

How do you figure out where you are located?

How did you come up with the zones?

Who on the board represents Wallace County?

Is the maximum 25% reduction based on your historical pumping?

Will there be a vote?

Can we do a district-wide WCA instead?

Why was 2009-2015 used?

What is your depletion goal?

Are you going to install more observation wells?

What's the reversal process if there is public outcry?

Is SD6 going to re-up?

Is this going to permanently reduce my water right?

Was there an economic study?

Has the board been advised to wait until the economic study is over?

Is the economic study available?

Can we vote?

What is the time frame for implementation?

Have you contacted the county assessor?

Is there economic impact in SD 6?

How many of the wells in SD 6 get measured?

How did you get the different colors?

When are the observation wells measured?

Comments:

You should do a 20% reduction of all wells and for one year in five you can't pump water.

South of Ruleton I don't have a decline problem, but four miles away they do.

A provision needs to be included to discontinue the plan and make it a reversible process.

This will create a 10% net decrease in economics.

I want to see the scatter plots to determine the % reduction needed in the decline areas.

The longer we extend the aquifer, the longer we benefit.

You need to include a possible drought contingency plan.

Bigger government is not good.

Blue areas should have restrictions if truly a groundwater management district.

Thank you for your efforts.

There should be a 10% reduction in five years for areas that still have a decline. That 10% reduction should continue every five years until no decline.

Thank you to the board for listening to our comments at the last public meetings. The map is proof that you listened to us.

PLEASE SIGN IN

Goodland 80

Craig Boggio
Royce Kohlbeck
Steve Evert
[illegible]
HD House
David Leonard
Joyce Schilling
Terri Bellamy
Alan Townsend
Larry King
Shawna Johnson
Mary Volk
Jace Mosbarger
Jim Mosbarger
Barry Guyer
James Fritz
David Dorn
Gary Seaholtz
Jane McCarty
Bob + Norma Grenagar
Kelly Stewart
[illegible]
[illegible]
Leonard [illegible]

24

PLEASE SIGN IN Goodland

Brent Cook
Dick Pettibone
Zach Cowell
Nate Emig
John Rabe
Chris Soehner
Keith Snethen

Goodland

PLEASE SIGN IN

David Pedersen
Katie Harness
John Deeds
Darla Deeds
Scott Briney
Frank Van Loeys
KIRK RICE
Elmer & Joyce Purvis
Ken Palmgren
Zach Zweygardt
Ron Robinson
Brady [illegible]
Lonnel Whiteker
GERALD FRANKLIN
LINDA FRANKLIN
Thad Hahn
Neal Thornburg
Joey Snethen
Scott Hooker
DENNIS SHANK
[illegible]
Norman House
Kim Dale
Ryan Dale
Storm Colorado
Gregory E. Case

24

PLEASE SIGN IN Goodland

Ross Townsend

Mike Rogers

Rick Blunder

Tyson Davis

PLEASE SIGN IN Goodland

Ron & Marsha Schilling
Kevin Schmidt
Jan de Waal
Frank Linden
Curtis Dopan
Melvin R. Nemechek
Connie Sigg
Jeff Younger
Tim Frankler
Dan Stephens
David Stephens
Chuck Thomas
Allen Quenzer
Steve Duell 27
Rich Simon
Dillon Trachsel
Jake bolin
John Ramsey
Kent Williams
Mike [illegible]
Jeanne Fox Jones
Darrell Owens
Robin Reeds
Dennis Coryell
Darrel Cloyd
Lou Hines
Tom Livengood

ST FRANCIS (49 signed in)

Questions:

How are acres determined?

What happens to water rights still in their perfection period?

What does "encourage" mean in relation to municipalities?

What is depth to water in these areas?

Will it be a reduction in the water right or only what is allowed to be pumped?

If you change tenants in the middle of the five year period, what happens to your remaining allocation?

How much water does this save?

What are the ramifications for going over?

How much is allowed in SD 6?

Can you bank the water if you don't use it?

What are the economic ramifications?

How have the other meetings gone?

Is there any provisions on contiguous acres?

Why is there no flexibility in this plan?

Comments:

I pump 21" per year but was hailed out one year so my average is skewed. That may not trigger the no more than 25% reduction.

St. Francis

PLEASE SIGN ~~UP~~ IN

(49)

Jeff Younger
Martin Haupt
Tom Haupt
Craig Busse
Mike Rooney Bird City
Kermit Bear Bird City
Michael Rooney
Lonnie Willis
William [illegible]
Dan Stephens
Alex Evert
Dennis Wright
W. M. Wright
Clayton Janicke
Adam Deeds
John Deeds
David Hendricks
Kole Yonker
Brooks Brenn

HOXIE (60 signed in)

Questions:

If SD 6 re-ups will they keep their flexibility?

What about restricting the well at the Sheridan Lake?

How many AF do they have?

Who came up with the 12 g/h/d?

Why did you go on a township level instead of individual wells?

How many acres does each observation well cover?

How and when will you know it's working?

How many wells in SD 6?

How do the declines compare to outside of SD 6?

What happens when SD 6 re-ups?

How many townships in SD 6?

Does 5 years give you enough time to readjust if it's not working?

Are you going to get tougher if there is still a decline?

There's not much irrigation in my red township, but there is a huge feedlot and ethanol plant. Have you taken this into account?

How many other hot spots (HPA) are there in the district?

Can you buy water rights like you can in SD 6?

After 5 years what's the plan?

Does the amount I've historically pumped affect me?

If we don't do something now, will the state come in later?

Comments:

The data is inaccurate.

If SD 6 can do it then it should be district-wide.

I want out of the district.

I have issues with tax payers paying for the building and supplying money to the Foundation.

We need to educate the people in town on the water problem.

You can't wait another 20 years to solve this problem.

I testify the LEMA is working. The farm management improves.

The probes, and other technology work.

Please Sign in Hoxie

John Lindenman

Shawn Lindenman (ell)

Mark Hill

Ginger Pugh KDHDwk

Kelly Stewart

Paul Watkins

Nick Hixon

Dal Brenner

Matt Palmquist

Howard Haskett

Dail Beamer

Randall Youkel

Ray Slipke

Bob Gronsta

Nathan Keit

Harold Murphy

Jerry McKenna

Kevin Laber

Ed Wing

Kevin Cole

Wade Tremblay

Shane Beckman

Randy Ochs

Paul Bangs

Dave Walden

Lenny Patner

Pat Heil Hoxie
Rick Moss Hoxie
Don Mozo Hoxie
Harold Foster "
Rick Dellago Brewster
Mike McHenry

EXHIBIT 1.1

Usage

YEAR	IRR	ALL	PCT IRR
2009	298748	307051	97.3 %
2010	366963	374985	97.9%
2011	424196	433331	97.9%
2012	530102	539567	98.2%
2013	463169	472237	98.1%
2014	392994	401167	98.0%
2015	398847	410616	97.1%

Source: GMD 4 File : 2000-2015 wur STANDARDIZED ANNUAL SHEETS 12-9-16

Allocations

TOTAL 848476.9 AF
IRR 831928.0 AF
Source: GMD 4 File: wells.dbf

Recharge Figures

USGS=160320.2018 DWR=126910.1816
Source: GMD/KGS file F:\SECTION LEVEL FILES\all section level data 9-8-14 w x-sec

Decline Data
Source: GMD 4 file OBSMSTR.XLS

EXHIBIT 2.1

Proposed 42nd Annual Meeting Minutes – Goodland, Kansas – Feb 1st 2017

Subject to Approval at the 43rd Annual Meeting of the Northwest Kansas Groundwater Management District No. 4

42nd Annual Meeting Minutes – Northwest Kansas Technical College, Goodland, Kansas, February 1st, 2017.

The 42nd annual meeting was opened at 1:44 P.M. MST, February 1, 2017 at the Northwest Kansas Technical College, Goodland, Kansas. Board members present were:

Dave Rietcheck	Jeff Deeds	Doug David
Roger Zweygardt	Lynn Goossen	Mitchell Baalman
Justin Sloan	Brent Rogers	Scott Maurath
Shane Mann	Monty Biggs	

Others present were: Staff: Ray Luhman, Shannon Kenyon, Dan Simmering, Rita Wade; Adam Dees - attorney;, Lane Letourneau, Kelly Stewart, Steven Walters and Chelsea Erickson - DWR; Tracy Streeter & Richard Rockel – KWO; Jonathan Aguilar – K-State Research and Extension; Brownie Wilson – KGS; Bill Golden – K-State; Shawn Beach - USDA

There were 108 persons that signed the attendance sheet. The attendance roster is available from the district office.

President Brent Rogers opened the meeting with a welcome and introductions of the board, staff, state agency staff, and former board members present.

President Rogers then turned over the meeting to Jeff Deeds for presentation of the 41st annual meeting minutes, Hoxie, Kansas, February 10, 2016. Jeff directed attention to the annual meeting minutes printed in the annual meeting packet (page 3) and gave everyone a chance to review them. It was moved and seconded to accept the minutes on a unanimous voice vote.

Dave Rietcheck next presented the 2018 proposed operating budget. Dave reported that the 2018 budget was $479,165. With no further questions or comments, the proposed 2018 budget of $479,165 was moved and seconded to be approved on a unanimous voice vote.

Dave Rietcheck next presented the 2016 calendar year financials. Dave directed attention to the financial report contained in the annual meeting packet at page 7 & 8 and asked everyone to review the report. He summarized by reporting that the district brought in $699,821; spent $491,167. The total cash on hand reported as $208,654. Dave finally noted that the Foundation (not affiliated with the district) had a December

31, 2016 balance of $440,058. Following review and with no questions or comments, it was moved and seconded the financials be approved on a unanimous voice vote.

Justin Sloan next conducted the board elections. Justin opened Position 1 (Cheyenne County) announcing that Roger Zweygardt was the single candidate that had pre-filed. Justin opened the floor for additional nominations for Position 1. With no additional nominations, It was moved and seconded the nominations for Position 1 cease and a unanimous ballot be cast for Roger Zweygart. With no further discussion, the motion passed unanimously by voice vote.

Justin opened Position 4 (Sherman/Wallace County) announcing that Nathan Emig and Jace Mosbarger. . Justin then opened the floor for additional nominations for Position 4. Each candidate spoke to the audience on their position. With no additional nominations, it was moved and seconded that nominations for Position 4 cease and a ballot be cast. No further discussion, the motion passed unanimously by voice vote.

Justin opened Position 6 (Thomas County) announcing that Lynn Goossen and Tyler Hill had pre-filed. Justin opened the floor for additional nominations for Position 6. No additional nominations were made. Lynn Goossen spoke to the audience on his position. It was moved and seconded that nominations for Position 6 cease. With no further discussion, the motion passed unanimously by voice vote.

Eligible voters then cast their ballots to be tallied by Adam Dees, Linda Franklin and Tracy Streeter.

As ballots were being tallied Brent Rogers discussed several items of interest printed in the meeting packet. Discussion was also had about the proposed District Wide LEMA with several questions asked and comments made.

Justin Sloan then announced the election results with Roger Zweygardt in the Cheyenne 1 position uncontested, Nathan Emig with 63 votes and Jace Mosbarger with 37 in the Sherman/Wallace 4 position, and Lynn Goossen with 59 votes and Tyler Hills with 32 votes in the Thomas 6 position.

It was moved and seconded that the 42nd annual meeting of the Northwest Kansas Groundwater Management District No. 4 be adjourned. With no objections, President Rogers declared the 42nd annual meeting of the Northwest Kansas Groundwater Management District No. 4 adjourned.

Respectfully submitted

Jeff Deeds, Secretary

Exhibit 2

Testimony of the Northwest Kansas Groundwater Management District No. 4 (GMD 4) to Hearing Officer David Barfield, Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

RE: Written Testimony for Proposed District-Wide Local Enhanced Management Area (LEMA) of November 14, 2017

Presented by: Raymond Luhman

This testimony is from Northwest Kansas Groundwater Management District No. 4 (GMD 4). It was approved by the GMD 4 Board of Directors.

GMD 4 submits this testimony in support of the Chief Engineer finding that the proposed Local Enhanced Management Area (LEMA), with a minor modification, will conserve water and educate water users on further conservation methods to extend the life of the Ogallala aquifer in Northwest Kansas. The GMD 4 provides a short history of the Kansas Water Appropriation Act (KWAA), the Groundwater Management District Act (GMDA), the Local Enhanced Management Area (LEMA) statute, and the previous actions taken in this proceeding. Then, GMD 4 re-states its goal. Last, GMD 4 shows how the corrective control measures should reach the goal in this case.

1. History of the Kansas Water Appropriations Act

In 1944, the Kansas Legislature passed the Kansas Water Appropriation Act (KWAA). K.S.A. 82a-701 et seq. In passing the KWAA, the Kansas Legislature dedicated "All water within the state of Kansas . . . to the use of the people of the state, subject to the control and regulation of the state . . . ." K.S.A. 82a-702.

Then, in 1972, the Kansas Legislature supplemented the KWAA with the Groundwater Management District Act (GMDA). K.S.A. 82a-1020 through 82a-1041. In doing so, the Legislature:

> "recognized that a need exists for the creation of special districts for the proper management of groundwater recourses of the state; for the conservation of groundwater resources; for the prevention of economic deterioration; for associated endeavors within the state of Kansas through the stabilization of agriculture; and to secure of Kansas the benefit of its fertile soils and favorable location." K.S.A. 82a-1020.

On December 19, 1974, after a series of informal meetings were held in the GMD 4 area to sense the will of the people relative to forming a GMD, a steering committee filed a declaration of intent and a map of the proposed district boundaries with Kansas' Chief Engineer. After further discussions between the steering committee, the Kansas Department of Agriculture Division of Water Resources (DWR), and the Chief Engineer, the Chief Engineer certified a final description of the district boundaries.

In 1975, the water users voted in favor of creating GMD 4. On May 24, 1976, the initial meeting was held in Colby, Kansas. Eleven board member positions were opened for election and all the positions were filled. GMD 4 was established. Since that time, GMD 4 has undertaken many conservation efforts, including purchasing water rights; monitoring annual usage; sending advisory letters to those who appeared to pump more water than necessary; ending new development; and creating the first LEMA in the Sheridan 6 High Priority Area (SD-6 LEMA). GMD 4 now embarks on a new conservation effort, LEMA using those same boundaries contemplated in 1974 and adopted in 1976 for GMD 4.

In 2012, at GMD 4's request, the Kansas Legislature passed the Local Enhanced Management Area (LEMA) statute. *See* K.S.A. 82a-1041. Any LEMA is a creature of statute. As part of the GMDA, K.S.A. 82a-1041 allows GMDs to address groundwater declines and other conditions of concern through management plans that include specific goals and corrective control procedures while still being consistent with state law. This local autonomy over the management plan distinguishes LEMAs from IGUCAs. The LEMA statute refers to the IGUCA statute to establish the groundwater conditions that may give rise to creating a LEMA. A LEMA must comport with the public interest, a term that figures prominently in both the KWAA and the GMDA, because the Chief Engineer has the statutory duty to regulate the distribution of the state's water resources for the benefit of all of its inhabitants according to the law. K.S.A. 82a-1041(b)(2); K.S.A. 82a-706; K.S.A. 82a-702; K.S.A. 82a-1020. GMD 4 proposed and administered the first LEMA—the SD-6 LEMA. Now, GMD 4 proposes this LEMA.

2. History of these Proceedings

On June 8, 2017, GMD 4 submitted a revised LEMA Proposal (the Proposal) to the Chief Engineer. Before submitting the proposed LEMA, GMD 4 held four public meetings in Colby, Goodland, Hoxie, and St. Francis, Kansas; and, had multiple board meetings, with many interested people attending, over a two and half year period between January 2015 and June 2017 to discuss the Proposal. This represented a significant public involvement in the process that resulted in the locally developed and locally requested plan. Additionally, GMD 4 had previously presented a more restrictive program at an additional 4 meetings. The public acceptance of that program was less positive, and therefore the board rejected that program.

On June 27, 2017, the DWR and Chief Engineer found that "on its face," the Proposal met the threshold requirements of K.S.A. 82a-1041(a) and initiated these proceedings. This determination on whether the Proposal met the K.S.A. 82a-1041 thresholds was not a final determination but an initial determination that the Proposal warranted further review, input, investigation, testimony, and consideration. To begin that review, the Chief Engineer delegated his authority to an independent hearing officer, Constance C. Owen, to conduct the initial public hearing in this matter. Notice was given of that first hearing as required by K.S.A. 82a-1041(b).

On August 23, 2017, Constance C. Owen, Hearing Officer, conducted the initial hearing on whether the Proposal met the statutory requirements of K.S.A. 82a-1041(b) and whether this matter should proceed to a second hearing. Written testimony was allowed to be submitted on this issue until September 13, 2017. *See* Order on Initial Requirements of the Groundwater Management District No. 4 District-Wide Local Enhanced Management Area, 21 (Aug. 23, 2017) (Initial Order).

The testimony GMD 4 presented, both oral and written, for the August 23, 2017 hearing is incorporated and made a part of this testimony. Therefore, this testimony will focus on the goal, the proposed corrective control measures, and the implementation of the proposed corrective control measures.

On September 23, 2017, Ms. Owen issued her Initial Order concluding that the Proposal "satisfied the three initial requirements for approval as set forth in K.S.A. 82a-1041(b)(1)-(3)."

These are excerpts from the GMD #4 Management Program of 9/19/2016, Section IV. Subsection 6 and Subsection 1 b and go further in explaining that the proposed restrictions are in the public interest:

3. The Proposal, as found by Hearing Officer Owen's, is in the public's interest.

K.S.A. 82a-1020 is the Legislative declaration relative to establishing groundwater management districts in Kansas. It declares that in the public interest it is necessary and advisable to permit the establishment of GMDs which allow local water users to determine their own destiny with respect to the use of groundwater—insofar as that destiny does not conflict with the basic laws and policies of the state.

As described by GMD 4's management plan, "Public interest" is a fundamental term used throughout the KWAA and GMDA, and within regulations developed under both statutes. Yet the term is only narrowly defined within state statute and regulation. It has been generally accepted that the complete definition of this term is actually embodied in the full suite of statutes and associated regulations, and therefore must be considered in this total, overarching context. This full context also includes the administrative, executive and judicial systems whose policies and actions also become part of the complete definition. In contrast, it has also been generally accepted that a specific statutory definition of "public interest" would be restrictive and confining, thus having more disadvantages than advantages.

The GMDA made it state policy that the local land owners and water users were to determine their own destiny in regard to groundwater management issues—so long as local decisions were consistent with state law. Since a groundwater management district cannot determine its own destiny without also expressing its own public interest, it seems logical that such authority is inherent in the GMDA.

In this spirit, this LEMA is being proposed by the GMD 4 BOD, because it believes is best for the landowners and water users of GMD 4 and hence best for the state of Kansas. The board also believes it is more clearly within the spirit of the LEMA statute. If in fact the entire suite of statutes and regulations define public interest in concert with the administrative, executive and judicial systems, then the GMDs and LEMAs are clearly a part of these systems and they deserve sufficient consideration. A single expression of public interest exclusively from the state perspective may not serve Kansas as well as a more flexible definition recognizing regional diversity.

When the LEMA process comes from the local board of directors and the corrective control provisions being requested from that process are consistent with state law, then the public interest of K.S.A. 82a-1020 has been satisfied.

In any event, the GMD 4 provided GMD 4 water users information very early in the discussions of the District Wide LEMA. The evidence provided the water users showed that adopting and implementing any corrective control provisions that would reduce water use, would also extend the life of the regional aquifer.

A web page was created to keep the process available to the public and was updated regularly by GMD 4 staff. Beginning in January of 2015, the process was covered by at least 28 board meetings.

4. The corrective controls measures should reach the LEMA goal.

4.1. The Goal for the LEMA is to promote improved management of water and not exceed irrigating 1.7 million acre-feet over a five year period.

The request for a LEMA contained the following goal statement and detail:

To promote improved management of water used district-wide with a goal not to exceed 1.7 million acre-feet (AF) for irrigation over five years within townships displaying an annual decline rate for the period 2004 – 2015 of 0.5% or greater annual decline and promote more efficient use by non-irrigation uses.

This LEMA shall exist only for the five- year period beginning January 1, 2018 and ending December 31, 2022. The proposed LEMA shall include all points of diversion located within the boundaries of GMD 4 excluding vested rights and points of diversion whose source of supply is 100% alluvial.

The total program diversion amount of 1.7 million AF for irrigation use for townships with annual decline rates of 0.5% or greater shall represent five (5) times the sum of designated legally eligible acres times the amount designated for irrigation water rights;

The Northwest Kansas Groundwater Management District No. 4 shall use the procedures herein to determine the 5-year allocation for each water right, and specify said values in Section 3). All allocation values shall be expressed in terms of total acre-feet for the five-year LEMA period. *See* Attachment 1, Request for a District-

Wide LEMA Submitted to the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources (June 8, 2017) (Proposal).

GMD 4 established that goal because many parts of the Ogallala Aquifer within GMD 4 are declining at a rate greater than .05% per year. At the initial hearing, Hearing Officer Owens specifically found that:

> The credible and relevant data provided by the [Kansas Geological Survey] KGS and used to develop this LEMA proposal corroborates GMD 4's conclusion that water levels are declining or have declined excessively and that withdrawals equal or exceed the rate of recharge in the area of the proposed GMD 4 LEMA. Initial Order at 12.

The Hearing Officer based her finding on KGS's measurements of depth-to-water in about 1,400 wells taken from the same year. After taking those depth-to-water measurements, KGS calculated three-year averages (2004, 2009, and 2015) and isolated the data relative to wells within GMD 4. KGS determined that the average saturated thickness for GMD 4 was 76 feet in 2004 and 70 feet in 2015. Parts of Sherman County had an average rate of decline of over 20 feet and much of Sherman County and portions of Thomas and Sheridan County averaged declines of 12 feet over the six year period from 2009-2015. KGS concluded that "The major driver for these water level declines is groundwater pumping as illustrated by published reports (citation omitted), which show statistically significant correlations exist between annual water-level change and annual groundwater use across GMD 4."

4.1.1. The corrective controls measures should reach the LEMA goal as applied to irrigation water use.

The corrective control measures will reach the goal by reducing pumpage. GMD 4 determined the LEMA allocation for each water right using the procedures described below.

To determine a water user's LEMA allocation, GMD 4 first determined what acreage a water users recently irrigated (irrigated acres). To determine irrigated acres, GMD 4 examined annual water use reports from 2009–2015. GMD 4 used the 2009-2015 range because 2009 was the first year that all wells in GMD 4 were metered and 2015 was the last year that water use data was available when the LEMA process through the public meetings was initiated. The maximum reported irrigated acreage during that period was used to set the irrigated acre amount (or eligible acre amount) for

each right. GMD 4 checked any discrepancies or inconsistencies against the United States Department of Agriculture aerial photos, the actual water rights, and the water use reports to finally determine irrigated acres (or eligible acres).

GMD 4 derived the LEMA township annual decline percent for the period of 2004-2015 from KGS section level data. A section is an area about one square mile containing 640 acres with 36 sections making up one survey township on a rectangular grid. The KGS compiled data on a section-by-section basis to determine the section-by-section declines. The KGS section level data was averaged for each legal township in the district. KGS section level data was used because it assigns a value for bedrock and water level elevations for each specific section. Then, GMD 4 removed all wells with any alluvial connection from the data set. Additionally, GMD 4 removed any sections that exhibited less than 15 feet of saturated thickness from the analysis; because, removing those sections minimized the depletion status of areas on the fringe of GMD 4. Very small declines in areas of little saturated thickness result in unacceptably high percentage figures, which is why they were removed from the analysis. This section level data GMD 4 relied on to determine the township declines and the LEMA allocations.

Last, GMD 4 examined the Net Irrigation Requirements (NIR) set by the United State Natural Resource Conservation Services. (NCRS). See U.S. Dept. of Agric., Nat. Res. Cons. Serv., Nat'l Eng'r Handbook, Irrigation Guide, KS210-652-H,, Amend. KS31, KS652-4.1 thru 4.25 (2014), https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_030990.pdf. The State of Kansas has used the NIR amounts since at least 1994 and referenced the NIR amounts in K.A.R. 5-5-9, K.A.R. 5-5-10, K.A.R. 5-5-11 and other regulations. The GMD 4 Board used the NRCS NIR 50% and 80% values for corn by county. 50% NIR represents the net irrigation requirement for corn that would be sufficient in 5 out of 10 years (considered to be normal) based on the precipitation that would be expected in 5 out of 10 years. 80% NIR represents the net irrigation requirement for corn that would be sufficient in 8 out of 10 years (considered to be dry) based on the precipitation that would be expected in 8 out of 10 years.

These figures were then interpolated to derive a value at the western edge of each zone. Each township was then assigned a color based on the zone in which it was located," red, yellow, purple, blue and green. Townships exhibiting greater than a 2% annual decline rate were assigned the 50% NIR for corn by zone (red). Townships exhibiting from 1% to 2% annual decline rate were assigned the 80% NIR for corn

by zone (yellow). Townships exhibiting 0.5% to 1% were assigned an 18 inch allocation district-wide (purple). Those townships that are below the 0.5% decline rate will not have restrictions on their diversions imposed (blue and green). The tiered system gives due consideration to water users who have already implemented reductions in water use resulting in voluntary conservation measures as evidenced by a slower rate of decline. No township has an allocation less than the 50% NIR for its respective zone.

Last, GMD 4 multiplied the irrigated acre values by the allocation amount on the map attached to the Proposal based on the decline percentage for the township where the point of diversion was located and the corresponding NIR. That NIR number was then divided by 12 (to convert to acre-feet) and then multiplied times the acres times five to determine the five year LEMA allocation. For example, in township 8-42W in Sherman County, the NIR for corn is 16.1 inches per acre. If a water right user irrigated 124 acres in that township, then the LEMA allocation would be 832 acre-feet over five years.

The LEMA allocation will also not reduce water users by greater than 25% except for those being reduced to an 18 inches per acre per year cap. No LEMA allocations within areas of decline greater than .05% will be receive an allocation in excess of 18 inches per acre per year. These amounts apply to those water rights in red, yellow, and purple townships.

The LEMA proposal also contains provisions addressing specific situations. Those provisions include:

> Wells pumping to a common system or systems shall be provided a single allocation for the total system acres, subject to the review process in Sections 5 and 6. The total amount pumped by all of the wells involved must remain within the system allocation.
>
> No water right shall receive more than the currently authorized quantity for that right, times five (5).
>
> No water right within a K.A.R. 5-5-11, 5-year allocation status shall receive an allocation that exceeds its current 5-year allocation limit.

No water right shall be allowed to pump more than its authorized annual quantity in any single year.

In all cases the allocation shall be assigned to the point of diversion and shall apply to all water rights and acres involving that point of diversion. Moreover, in all cases the original water right shall be retained.

For water rights enrolled in EQIP and/or AWEP that will be coming out of either program on or before September 30, 2022, the allocation quantity shall be set at the annual allocation for only the remaining years of the 2018-2022 LEMA period.

If a water right is or has been suspended, or limited for any year of this LEMA, due to penalty issued by the Kansas Department of Agriculture, Division of Water Resources (DWR), then the GMD 4 and DWR will reduce the allocated quantity for such water right accordingly for the 2018-2022 LEMA period.

For water rights enrolled in a KAR 5-5-11 change, MYFA, WCA, or other flexible water plan, the most water restrictive plan will apply.

Each allocation for irrigation will be a total 5-year amount. The Proposal does not contain an acre-inch per acre limitation. The allocation may be used in any fashion and at any time during the LEMA chosen by the right holder, except that water user cannot exceed the annual authorized quantity unless authorized by a Muli-Year Flex Account (MYFA) or Water Conservation Act (WCA) term permit or plan.

After completing these calculations, about 65% of the wells or well-groups slated for a LEMA allocation will have a LEMA allocation that less than their combined diversions from 2009 – 2015.

The base water right will not be altered during the LEMA period. Any order issued under the LEMA will be subject to the additional LEMA terms and conditions for the five years during the LEMA. GMD 4 further requests that any future reiterations of

this LEMA that may come into existence or be proposed by the GMD 4 Board take into consideration allowing a maximum 10% carry-over of the LEMA allocated amount. *See* Proposal 1)d)-l). This gives future GMD 4 and LEMA boards an opportunity to continue rewarding those that conserve. It also incentivizes conservation into the future.

4.1.2. The corrective control measures, with modifications, should reach the LEMA goal.

For non-irrigation use type, the GMD 4 Board requests that the following language modify the stockwater portion of the proposed LEMA (Modifications) for two reasons. First, the total acre feet allocated to stockwater use in GMD 4 is less than 0.5 % of total appropriations. Second, animal feeding and dairies represent a significant market for local crops and the GMD 4 Board reasoned that animal feeding and dairies should not be unduly restricted.

The GMD 4 Board still encourages livestock and poultry operations to only use 90% of the amount they are allocated. The proposed Modifications read:

> Part 2)a) Livestock and poultry use will be encouraged to maintain their use at 90% of the said amount provided by K.A.R. 5-3-22 based on the maximum amount supportable by the number of animals authorized by a current facility permit. At no time will a stockwater right be authorized to pump more than its authorized quantity. . . .
>
> Part 2)d) When converting from irrigation to non-irrigation use, the base water right will be converted under the procedures in K.A.R. 5-5-9, 5-5-10, or Groundwater Management District #4 regulations, and the appropriate non-irrigation Local Enhanced Management Area allocation will apply as found in Section 2 for the remainder of the Local Enhanced Management Area period.

Parts 2)b), 2)c), and 2)e) of the Proposal would remain the same. With the acceptance of the above modifications and because of the small fraction of the groundwater used for stock water, dairies, and recreational use, this should not be an impediment to adopting the Proposal. Additionally, stock water and dairies provide a market for crops such that the GMD 4 BOD determined decreasing the stock water and dairy use could negatively impact the agricultural economy in the region and adversely impact implementation of the Proposal.

4.1.3. Appeal Process

If an irrigation user believes they have more irrigated acres or have applied water in a different fashion than reported, an appeal process will be instituted to allow individuals and GMD 4 to review their irrigated acres. Any appeal must begin by March 1, 2019. Only irrigated acres and LEMA allocations may be appealed. The process also allows additional data from 2016 and 2017 to be considered. Again, the information the GMD 4 had when it submitted the proposal was from 2009-2015.

Water users and GMD 4 staff will conference regarding discrepancies in irrigated acres. Any decision made by GMD 4 staff may be brought before the GMD 4 board for a final decision.

This appeal process is an effort by GMD 4 to make sure that the allocations are correctly set.

4.1.4. Violations

Violations under the Proposal will be consistent with the violations in the SD-6 LEMA. These are added fines and/or suspensions to be applied in the case of over-pumping the LEMA quantity. While this does provide penalties for over-pumping the LEMA quantity; it is equally important that accurate data is available regarding water use and these provisions provide additional methods to test the accuracy of the data. In the first five years of the SD-6 LEMA, no violations occurred. There is an additional incentive for those townships not currently being issued a LEMA allocation. That incentive is to maintain or improve on current pumping levels to ensure that their respective townships do not reach decline levels that would require restrictions if a future LEMA were proposed.

An added violation concerns meter tampering. If a preponderance of evidence suggests that actions have been taken to remove or alter the meter's ability to accurately measure flow the offending water right will be suspended for a period of five years and any remaining LEMA allocation will be lost.

There are some added requirements that apply to wells that have a LEMA allocation. These require that the meters be read at least every two weeks and that malfunctioning meters be repaired/replaced as soon as possible. It also requires a back-up system by which the amount of water pumped can be readily determined. If such back-up data

is unavailable it will be assumed that the entire appropriated right has been pumped for the purpose of LEMA record keeping.

4.1.5. Economic Viability

Preliminary economic studies done by Dr. Bill Golden on the SD-6 LEMA indicate that cash flow values inside that LEMA very closely resemble those of the immediate surrounding area. Dr. Bill Golden, Monitoring Impacts of Sheridan County 6 Local Enhanced Management Area, Interim Report 2013 – 2015, Nov. 8, 2016 (SD-6 Interim Report). It should be noted that the SD-6 LEMA has a much higher level of restrictions than the ones proposed by this LEMA.

A previous study was done by Golden, Peterson, & O'Brien, Potential Economic Impact of Water Use Changes in Northwest Kansas (2008) (The Golden Report). There, Golden et.al stated that, the least desirable option to institute cutbacks in diversions was to use a system that completely dries up acres—either by a first in time, first in right system, or other programs that take land out of irrigated production. They concluded that less water use on more acres had far less of a negative impact. Instituting reductions by using order of priority would have the effect of drying up many acres and for this reason, the GMD 4 board proposes giving an equal allocation to all non-vested rights based on their location and the decline rate of the Ogallala aquifer.

The Golden Report initially evaluated the potential economic consequences of reduced groundwater us in northwest Kansas. Specifically, the Golden Report evaluated the potential economic impacts of three possible reduction levels: (1) a zero reduction in groundwater pumping; (2) completely eliminating all groundwater pumping; and (3) reducing groundwater pumping by 30%. Regarding the third option, the Golden Report then assessed the respective economic impacts of achieving such a reduction by three scenarios: (a) by limited irrigation; (b) by a buyout of irrigation rights, while allowing dryland farming on dried-up lands; and (c) by a conservation program such as the Conservation Reserve and Enhancement Program (CREP), which requires a 15-year following period, after which dryland farming can resume. The Golden Report employed data that is consistent with the KGS model described above.

In assessing the respective economic impacts of the three possible reduction levels and the three scenarios described above, the Golden Report employed a variety of tools, including input-output impact analysis, and specifically, Impact Analysis for

Planning (IMPLAN). IMPLAN is a commonly accepted method of economic analysis that has been used by agricultural economists in Colorado, Kansas, and Nebraska. IMPLAN has been accepted as a reliable and persuasive method of assessing water-use impacts on agriculture by the Supreme Court of the United State. *See Kansas v. Colorado*, No. 105, Orig., Fifth and Final Report of the Special Master, at 20 (Feb. 4, 2008). *See also Kansas v. Colorado*, No. 105 Orig., 543 U.S. 86, 91 (2004) (accepting the use of IMPLAN to award economic damages).

According to the Golden Report, under the first option, over a 60 year period,—no reduction in groundwater pumping—the irrigated acres of the SD-6 area declined from 16,062 in year one to 8,245 in year 60. Future gross profits tracked this unregulated decline in groundwater levels beginning at about $5,279,829 in Year 1 and dropping to $3,997,627 in Year 60.

Under the other Golden Report extreme—a 30% reducing in groundwater pumping—the decline in water use and profitability is far less precipitous. The irrigated acres of the SD-6 area were projected to decline from 16,062 in year one to 13,327 acres in year 60. Future gross profits track this less aggressive decline in groundwater levels, starting at $4,717,461 in year one and dropping to $4,285,202 in year 60.

The SD-6 LEMA ultimately adopted a 20% reduction. A middle ground between continuing the groundwater mining then occurring and a 30% immediate reduction for all irrigated rights.

In 2016, Golden issued his Interim Report for the SD-6 LEMA. There, Golden found that past efforts (pre-LEMA efforts) to slow decline and ensure the future economic viability of the region have been largely unsuccessful. Golden noted that "LEMAs are proactive, locally designed, and initiated water management strategies for a specific geographic area that are promoted through a GMD and then reviewed and approved by the Chief Engineer." *Id.* at 1. He further notes that the LEMA blueprint may be the future of groundwater management; that it overcomes the problems associated with the 'top-down' Intensive Groundwater Use Control Areal (IGUCA) process; and it "minimizes the common property externality associated with groundwater extraction." *Id.* at 2.

Golden, in his SD-6 Interim Report, then compared those producers inside the SD-6 LEMA with those producers outside the SD-6 LEMA to determine the SD-6 LEMA's economic impact using methods that are consistent with methods used by the Kansas Department of Agriculture. *Id.* at 2-3. On comparing the control and the target group,

Golden concluded that producers were able to reduce groundwater use in the SD-6 LEMA area with minimal impacts on cash flow (gross profits less expense equating to net profits). *Id.* at 2-3.

Furthermore, the Proposal does not contain any restrictions below the average water needs for corn; and, most of the wells or groups have allocations at or above the drier 80% chance NIR for corn (see explanation of NIR above). Last, the greatest restriction, 25%, is well within the 0% reduction to 30% reduction ranges contemplated by the Golden Reports (Golden Report and SD-6 Interim Report) to maintain the economic viability of the GMD 4 region.

Conclusion

This concludes the written testimony for GMD 4. In sum, GMD 4 contends that:

1. The Chief Engineer should adopt Hearing Officer Owens' Order on Initial Requirements of the Groundwater Management District No. 4 District-Wide Local Enhanced Management (LEMA) and incorporate it into the Chief Engineer's order.

2. The Chief Engineer should issue an Order of Decision accepting the Proposal with the Modifications and return the Proposal with the Modifications to GMD 4 for approval.

3. On approval by GMD 4, the Chief Engineer should issue an Order of Designation designating all of GMD 4 as a LEMA and implementing the modified corrective controls within the Proposal and described above.

ATTACHMENTS

Attachment 1

Request for a District-Wide LEMA Submitted To the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources

June 9, 2017

In order to reduce decline rates and extend the life of the aquifer in Northwest Kansas Groundwater Management District No. 4 (GMD 4) the Board of Directors of GMD 4 proposes the following five year plan be submitted via the Local Enhanced Management Area (LEMA) process contained in KSA 82a-1041 for the entire area within the boundary of the Northwest Kansas Groundwater Management District No. 4.

Overview and Goal Expression

To promote improved management of water used district-wide with a goal not to exceed 1.7 million acre-feet (AF) for irrigation over five years within townships displaying an annual decline rate for the period 2004 – 2015 of 0.5% or greater annual decline and promote more efficient use by non-irrigation uses.

This LEMA shall exist only for the five- year period beginning January 1, 2018 and ending December 31, 2022. The proposed LEMA shall include all points of diversion located within the boundaries of GMD 4 excluding vested rights and points of diversion whose source of supply is 100% alluvial.

The total program diversion amount of 1.7 million AF for irrigation use for townships with annual decline rates of 0.5% or greater shall represent five (5) times the sum of designated legally eligible acres times the amount designated for irrigation water rights;

The Northwest Kansas Groundwater Management District No. 4 shall use the procedures herein to determine the 5-year allocation for each water right, and specify said values in Section 3). All allocation values shall be expressed in terms of total acrefeet for the five-year LEMA period.

1) Allocations – Irrigation

a) Proposed allocations provided in Sections 3 and 4 were determined based on the maximum reported and/or verified acres for years 2009-2015. Proposed allocations are subject to change in the case where incorrect water use data is verified via the process in Sections 5 and 6.

b) All irrigation water rights, excluding vested rights, shall be limited to the allocation for the water right location on the accompanying map over the 5-year period beginning January 1, 2018 and ending December 31, 2022. If a vested right and an appropriation right have the same place of use or same point of diversion, the vested right will be the vested water right's authorized quantity and the appropriation right will be limited to the total system allocation minus the vested water right's authorized allocation.

c) The base water rights will not be altered by any Order issued under this request, but will be subject to the additional terms and conditions described herein for the duration of the LEMA.

d) Wells pumping to a common system or systems shall be provided a single allocation for the total system acres, subject to the review process in Sections 5 and 6. The total amount pumped by all of the wells involved must remain within the system allocation.

d) No water right shall receive more than the currently authorized quantity for that right, times five (5).

e) No water right within a K.A.R. 5-5-11, 5-year allocation status shall receive an allocation that exceeds its current 5-year allocation limit.

f) No water right shall be allowed to pump more than its authorized annual quantity in any single year.

g) In all cases the allocation shall be assigned to the point of diversion and shall apply to all water rights and acres involving that point of diversion. Moreover, in all cases the original water right shall be retained.

h) For water rights enrolled in EQIP and/or AWEP that will be coming out of either program on or before September 30, 2022, the allocation quantity shall be set at the annual allocation for only the remaining years of the 2018-2022 LEMA period.

i) If a water right is or has been suspended, or limited for any year of this LEMA, due to penalty issued by the Kansas Department of Agriculture, Division of Water Resources (DWR), then the GMD 4 and DWR will reduce the allocated quantity for such water right accordingly for the 2018-2022 LEMA period.

j) For water rights enrolled in a KAR 5-5-11 change, MYFA, WCA, or other flexible water plan, the most water restrictive plan will apply.

k) No water right shall be reduced by more than 25% of their average historical pumping based on years pumped 2009-2015 unless it would allow a quantity over 18 inches per acre to be pumped.

l) Should GMD 4 request a new LEMA beyond the first five-year period, the GMD 4 Board will consider a maximum 10% carry-over of the LEMA allocation for the regions depicted in the purple, yellow, and red on Attachment 1 if a new district-wide LEMA is considered or pursued as a result of the LEMA Order Review discussed in Section 11.

2) Allocations – Non-irrigation

a) Livestock and poultry use will be restricted to 76% of the quantity of water deemed to be reasonable for livestock and poultry provided in K.A.R. 5-3-22 in townships with greater than 2% average annual decline and 85% of said amount in townships with average annual declines

between 1% and 2%, based on the maximum head supportable by the feedlot permit in effect on December 31, 2015. At no time will a stockwater right be authorized to pump more than its authorized quantity.

b) Municipal will be encouraged to reduce the amount of unaccounted for water reported annually on the water use report and reduce the gallons per capita per day.

c) All other non-irrigation users will utilize best management practices.

d) When converting irrigation to non-irrigation, then the most restrictive of the LEMA allocation, GMD 4 regulations, or conversion outlined in K.A.R. 5-5-9 will be used to determine the converted allocation amount.

e) The base water rights will not be altered by any Order issued under this request, but will be subject to the additional terms and conditions described herein for the duration of the LEMA.

3) Individual Allocation Amounts

The five-year allocations for every water right per Sections 1.a and 2 above shall be converted to a five-year acre-feet total, with Attachment 1 containing the assigned eligible irrigation restriction for each township. Each water right will be restricted to its total acre-feet allocation within the LEMA order issued through this process, subject to the review processes outlined in Sections 5 and 6.

4) Data Set

The relevant data for this LEMA proposal came from the Water Rights Information System (WRIS) maintained by the Kansas Department of Agriculture, Division of Water Resources (DWR).

If any data errors are discovered, then the GMD 4 Board requests that the person or entity discovering the errors contact GMD 4 to update or correct any alleged errors via the processes outlined in Sections 5 and 6.

Attachment 2 contains pdf files of irrigation and stockwater water right numbers and allocations. Associated spreadsheets will be kept by GMD 4 and DWR; will be available on the GMD 4 and DWR websites; and may be changed with the Chief Engineer's approval or through the processes outline in Section 5 and 6. The GMD 4 and the DWR will document or track any changes made to the irrigation water and stock water right allocations attached hereto.

5) Eligible Acres Process

Based on input from stakeholders, it was agreed that the following procedure would be used to assign eligible acres to every irrigation water right in the District-Wide LEMA and to include in any future LEMA request.

The GMD 4 and DWR determined eligible acres as follows:

a) The GMD 4 and DWR used the maximum reported authorized irrigated acres from 2009-2015 that could be verified as being legally irrigated with the GMD 4 in-house aerial photography and water right file information.

b) If the authorized place of use was not irrigated from January 1, 2009 to December 31, 2015, then earlier years that the water user irrigated the acres may be considered.

c) The DWR will contact every water right owner within 60 days after the Order of Designation and others known to them as operators or interest holders in the water right to inform them of the eligible acres assigned to their water right(s) under the adopted process, allow them the opportunity to appeal the assigned acres under the process described below and allow them the opportunity to provide more information to the GMD 4 Board on the correct acres. The GMD 4 Board's decision is final and the eligible acres determined by the GMD 4 Board will be used to calculate and assign the final allocations.

6) Appeals Process

a) Appeal Process. The following process will govern appeals regarding eligible acres and allocated water:

(1) Any appeal of the eligible acres and allocated water must be filed before March 1, 2019. Failure to file an appeal of the eligible acres and allocated water by March 1, 2019 will cause the assigned eligible acres and allocated water to become final during the LEMA period.

(2) Only eligible acres and allocated water may be appealed through this appeal process. No other issues including, but not limited to, the LEMA boundaries, violations, meter issues, etc., may be appealed through this process.

(3) Any appeal will first be heard by the GMD 4 staff who will determine eligible acres based on the factors above in Section 5) Eligible Acre Process.

(4) Any determination made by the GMD 4 staff may be appealed to the GMD 4 Board.

(5) The GMD 4 and DWR will use the acres and allocated water determined through the processes contained in Sections 5 and 6, as detailed above, to calculate and assign allocations.

b) Factors to be considered by the GMD 4 Board on appeal. The following factors, in order of importance, will be used when reviewing a determination of eligible acres and allocated water on appeal.

(1) First, the reviewer will first consider the location of the well(s) and their township allocations.

(2) Second, the reviewer may consider the authorized place of use.

(3) Third, the reviewer may consider any and all aspects of the water right, use, place of use, point of diversion, or any other factors the reviewer determines appropriate to determine eligible acres and allocated water.

7) 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 GMD 4 on its effective date.

b) Upon GMD 4 learning of an alleged violation, GMD 4 will provide DWR with the information GMD 4 believes shows the alleged violation. DWR, under its discretion, may investigate and impose restrictions and fines as described below or allowed by law.

c) DWR will address violations of the authorized quantities as follows:

(1) Exceeding any total allocation quantity of less than 4 AF within the allocation period will result in a $1,000.00 fine for every day the allocation was exceeded.

(2) 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.

d) In addition to other authorized enforcement procedures, if the GMD 4 Board finds by a preponderance of evidence that 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 GMD 4 Board will make a recommendation to the Chief Engineer that a written order be issued which states:

(1) The nature of the violation;

(2) The factual basis for the violation;

(3) That the water right is suspended for 5 years; and

(4) That the water right loses all remaining assigned quantities under the District-Wide Local Enhanced Management Area.

8) Metering

a) All water right owners shall be responsible for ensuring their meters are in compliance with state and local law(s). In addition to being in compliance and reporting annually the quantity of water diverted from each point of diversion, all water right owners shall implement at least one of the following additional well/meter monitoring procedures:

(1) Inspect, read and record the flow meter at least every two weeks the well is operating. The records of this inspection procedure shall be maintained by the well owner and provided to the district upon request. Should the flow meter reported readings be in question and the bi-weekly records not be available and provided upon request of the district, the well shall be assumed to have pumped its full annual authorized quantity for the year in question. Following each year's irrigation season, the person or persons responsible for this data may at their discretion transfer the recorded data to the district for inclusion in the appropriate water right file for future maintenance.

(2) 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 GMD 4 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:

(1) water right file number;

(2) legal description of the well;

(3) date the problem was discovered;

(4) flow meter model, make, registering units and serial number;

(5) the meter reading on the date discovered;

(6) description of the problem;

(7) 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; and

(8) the projected date that the meter will be repaired or replaced.

(9) Any other information requested by the GMD 4 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.

9) Accounting

a) DWR, in cooperation with GMD 4, shall keep records of the annual diversion amounts for each Water Right within the LEMA area, and the total 5-year quantity balances will make this information available to the Water Right Holder and the GMD 4 on their request.

10) Advisory Committee

a) A District-Wide LEMA Advisory Committee shall be appointed and maintained by the GMD 4 Board consisting of fourteen (14) members as follows: one (1) GMD 4 staff; one (1) GMD 4 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 irrigators with regional distribution identical to GMD 4 board member distribution. One of the District-Wide LEMA members shall chair the committee whose direction shall be set to further organize and meet annually to consider:

(1) water use data;

(2) water table information;

(3) economic data as is available;

(4) violations issues – specifically metered data;

(5) any new and preferable enhanced management authorities become available;

(6) other items deemed pertinent to the advisory committee.

b) The advisory committee in conjunction with DWR shall produce an annual report which shall provide a status for considerations (1) through (6) and any recommended modifications to the current LEMA Order relative to these six items. Said report shall be forwarded to the GMD 4 board and the chief engineer.

11) LEMA Order Reviews

a) In addition to the annual LEMA Order reviews per Section 10 the District-Wide LEMA Advisory Committee shall also conduct a more formal LEMA Order review 1.5 years before the ending date of the LEMA Order. Review items will focus on economic impacts to the LEMA area and the local public interest. Water level data may be reviewed.

b) The committee, in conjunction with DWR and GMD 4, shall also produce a report following this review to the chief engineer and the GMD 4 board which contains specific recommendations regarding future LEMA actions. All recommendations shall be supported by reports, data, testimonials, affidavits or other information of record.

12) Impairment Complaints

While this program is being undertaken, the GMD 4 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.

13) Water Level Monitoring

The data used to determine regional aquifer declines in Attachment 1are based on the annual water level monitoring taken by KGS and DWR. Those measurements will continue as the data

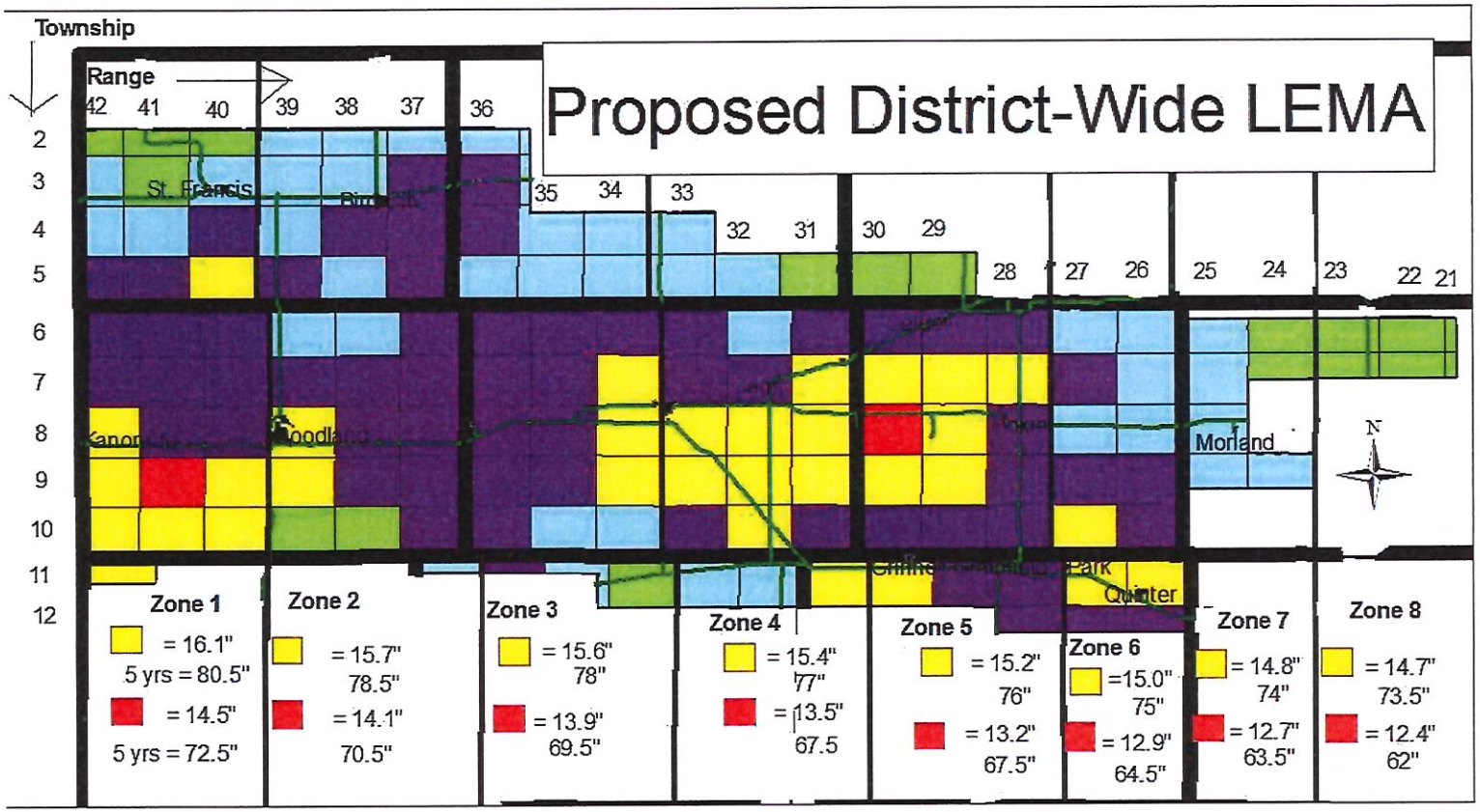
set used in determining water level declines. In the future, GMD 4 could, but is under no obligation, install additional monitoring wells.

14) Coordination

The GMD 4 stakeholders and the GMD 4 board expect reasonable coordination between the chief engineer's office and the GMD 4 board on at least the following efforts:

a) Development of the LEMA Order resulting from the LEMA process;
b) Accounting for annual pumpage amounts by LEMA water right owners/operators.
c) Compliance and enforcement of the District-Wide LEMA Order.

Attachment 1 to Proposal



Townships with 2%+ Average Annual Decline in 2004-2015

Townships with 1-2% Average Annual Decline in 2004-2015

Townships with 0.5 - 1% Average Annual Decline in 2004-2015 (18 inch max restriction)

Townships with 0-.5% Average Annual Decline in 2004-2015

Townships with no decline 2004-2015

Prepared by Shannon Kenyon GMD 4

Attachment 2 to Proposal

Irrigation and Stockwater Allocation PDF Files

GMD 4 LEMA
Irrigation Water Right

GMD 4 LEMA Stock
Water Rights.pdf

Attachment 3 to Testimony

Public Meeting Notes and Sign-in Sheets

PUBLIC LEMA BOARD MEETINGS QUESTIONS AND COMMENTS

COLBY (97 signed in)

Questions:

Is this a 5 yr. program?

What about restricting dairies?

We used to flood and haven't for a while, how will that affect me?

At the end of 5 years are you going to increase or decrease our allocation?

Why would we do this if we're the only district doing it?

Will we get a letter on what we will get under the plan?

Will we be able to bank the water?

Will there be a vote?

How much water is this going to save?

How is this a LEMA? It looks like an IGUCA

Why cut people that don't have a problem ?

What happens in 5 years?

Can we just "knock off" the new wells?

What happens if we do nothing?

Why the whole district?

Public Comments:

0.5 – 1% should also have a reduction.

This plan is a personal agenda.

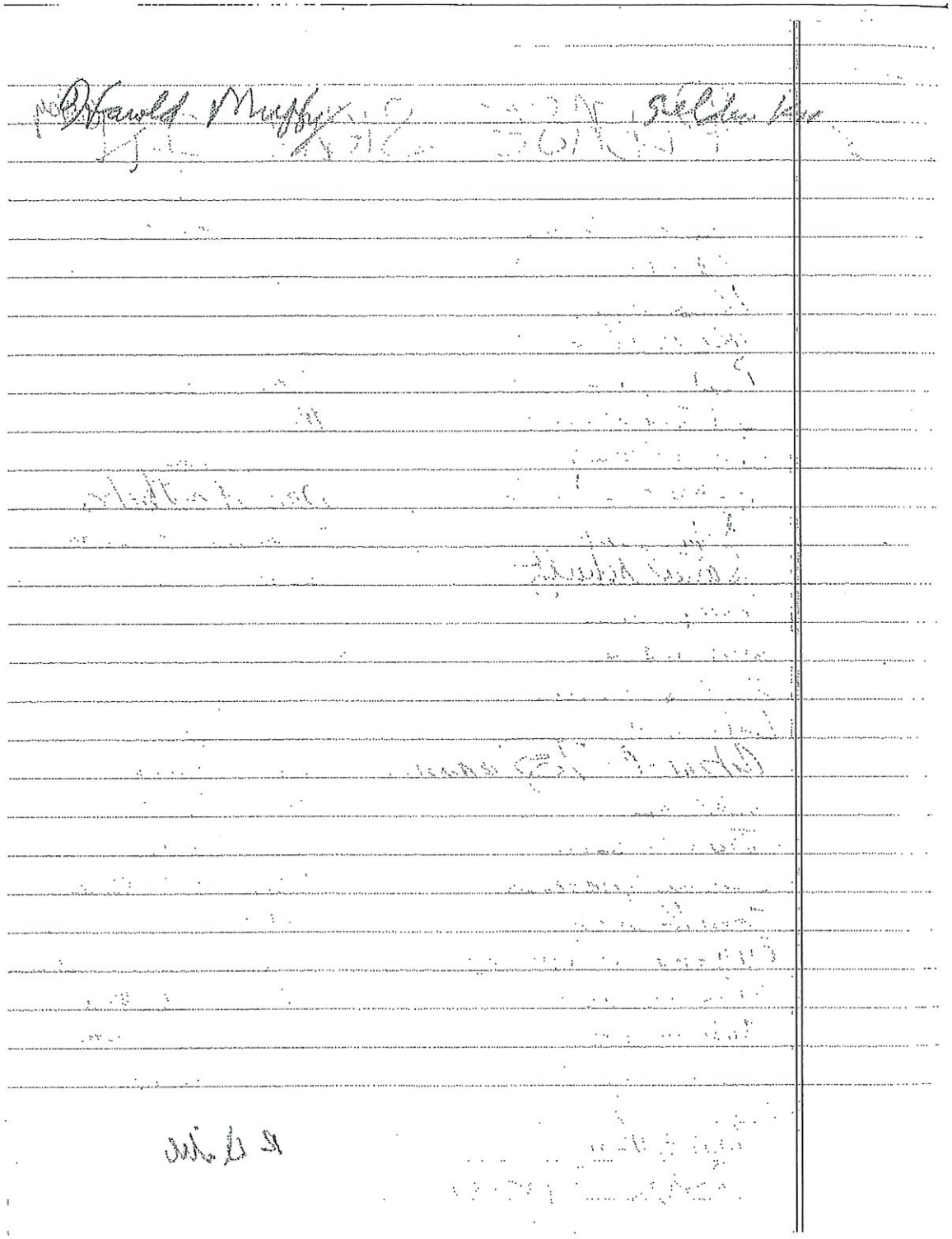
You need more measureable goals.

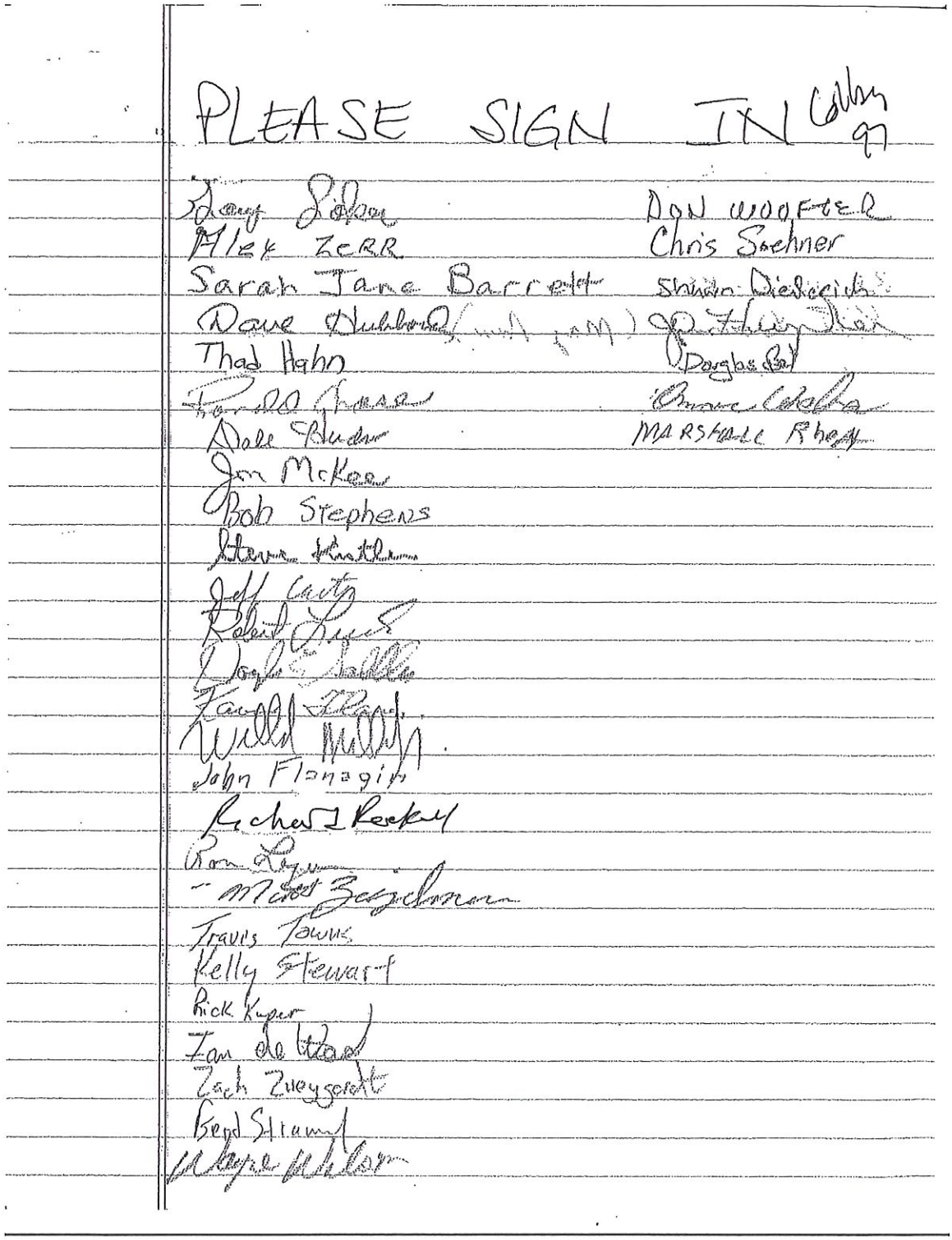
Data other than KGS should be used.

I've lost nine windmills, how here isn't afraid of the water going away.

PLEASE SIGN IN Colby

Brent Rogers	Connor Wilson
Jerry Bimmig	Steve Wilson
Norma Zerr	Don Rietcheck
Kent [illegible]	Kevin Marcotte
Kit Miller	Ben Harting
Phil Keck	Mike Stephens
Carl Ziegelmeier	Michael Juchemann
Chuck [illegible]	Tom Starns
ALAN & Andy Query	Dan Anthholz
Jeff Yonker	Marvin Albers
Daniel Schultz	Ashley Roth
Larry Towns	Richard Ernst
Jim McPhee	Ron Erickson
Ken Christiansen	Steve Baumchen
Curtis Dopan	[illegible]
Adam C. Boemer	Mark Myers
[illegible]	Jeremy Myers
Jon Friesen	Jim Frasier
Jeremy Kersenbrock	Ronald E. Neff
Tom Redmond	Jamie [illegible]
Eugene Schwarz	Dale [illegible]
Shane A. Bunker	Alan [illegible]
Todd Ziegelmeier	Dale [illegible]
Shirley Harlett	[illegible]
William Pickett	[illegible]
Ron Evans	R D [illegible]
Steve Friesen	




PLEASE SIGN IN
Alex ZERR
Sarah Jane Barrett
Thad Hahn
Dale Bluder
Jim McKee
Bob Stephens
John Flanagin
Travis Towns
Kelly Stewart
Rick Kuper
Zach Zweygardt
DON WOOFTER
Chris Suehner
Douglas Bal
MARSHALL Rhea

Kelly Harinek Farm Credit
Gloria J. Morgan

Mike Baumberger

Jerrod Flanagan

Nathan Goetz

Bob Gillen - KSU

Keith Downing (May Ann)

Jim Kopriva

Bernard Meyer

[illegible]

GOODLAND: (88 signed in)

Questions:

Is the purple 18" per circle?

What about EQIP acres?

Does this apply to vested rights?

How do you figure out where you are located?

How did you come up with the zones?

Who on the board represents Wallace County?

Is the maximum 25% reduction based on your historical pumping?

Will there be a vote?

Can we do a district-wide WCA instead?

Why was 2009-2015 used?

What is your depletion goal?

Are you going to install more observation wells?

What's the reversal process if there is public outcry?

Is SD6 going to re-up?

Is this going to permanently reduce my water right?

Was there an economic study?

Has the board been advised to wait until the economic study is over?

Is the economic study available?

Can we vote?

What is the time frame for implementation?

Have you contacted the county assessor?

Is there economic impact in SD 6?

How many of the wells in SD 6 get measured?

How did you get the different colors?

When are the observation wells measured?

Comments:

You should do a 20% reduction of all wells and for one year in five you can't pump water.

South of Ruleton I don't have a decline problem, but four miles away they do.

A provision needs to be included to discontinue the plan and make it a reversible process.

This will create a 10% net decrease in economics.

I want to see the scatter plots to determine the % reduction needed in the decline areas.

The longer we extend the aquifer, the longer we benefit.

You need to include a possible drought contingency plan.

Bigger government is not good.

Blue areas should have restrictions if truly a groundwater management district.

Thank you for your efforts.

There should be a 10% reduction in five years for areas that still have a decline. That 10% reduction should continue every five years until no decline.

Thank you to the board for listening to our comments at the last public meetings. The map is proof that you listened to us.

PLEASE SIGN IN Goodland 80

Craig Boggs
Royce Kehlbeck
Steve Evert
[illegible]
HD House
David Leonard
[illegible] Schilling
[illegible] Bellamy
[illegible]
[illegible]
Shawna Johnson
Mary Volk
Jace Mosbarger
[illegible]
Barry Guyer
James Fritz
David Dorn
[illegible]
[illegible] McCarty
Bob + Norma [illegible]
Kelly Stewart
[illegible] Armstrong
[illegible]
Leonard [illegible]

24

PLEASE SIGN IN Goodland

Brent Cook
Dick Pettibone
Zach Cowell
Nate Emig
John Bode
Chris Soehner
Keith Snethen
1

Goodland

PLEASE SIGN IN

David Pedersen
Katie Harness
John Deeds
Darla Deeds
Scott Briney
Frank Van Loeys
KIRK RICE
Elmer & Joyce Purvis
Ken Palmgren
Zach Zweygardt
Ron Robinson
Brady [illegible]
Lonnel Whiteker
Gerald Franklin
Linda Franklin
Thad Hahn
Neal Thornburg
Joey Snethen
Scott Hooker
Dennis SHANK
[illegible]
Norman House
Kim Dole
Ryan Dole
Storm [illegible]
Gregory E. Cure

2U

PLEASE SIGN IN Goodland

Ross Tanseni

Mike Rogers

Rick Bliedtner

Tyson Davis

4

PLEASE SIGN IN Goodland

Ron & Marsha Schilling
Kevin Schmidt
Jan de Waal
Frank [illegible]
Curtis Dopen
[illegible] R. [illegible]
[illegible]
Jeff Younger
Tim Frankler
Dan Stephens
David Stephens
Chuck Thomas
Allen Quenzer
Steve Duell
Rich Simon
Dillon Troehsel
Jake Bolin
[illegible]
[illegible]
[illegible]
Jeanne Fall [illegible]
Darrell Owens
Robin Reeds
Dennis Coryell
Darrel Cloyd
Lou Hines
Tom Livengood

27

ST FRANCIS (49 signed in)

Questions:

How are acres determined?

What happens to water rights still in their perfection period?

What does "encourage" mean in relation to municipalities?

What is depth to water in these areas?

Will it be a reduction in the water right or only what is allowed to be pumped?

If you change tenants in the middle of the five year period, what happens to your remaining allocation?

How much water does this save?

What are the ramifications for going over?

How much is allowed in SD 6?

Can you bank the water if you don't use it?

What are the economic ramifications?

How have the other meetings gone?

Is there any provisions on contiguous acres?

Why is there no flexibility in this plan?

Comments:

I pump 21" per year but was hailed out one year so my average is skewed. That may not trigger the no more than 25% reduction.

St. Francis

PLEASE SIGN IN

(49)

Jeff Younger
Martin Hempfel
Tom Hempfel
Craig Busse
Mike Rooney Bird City
Kermit Berg Bird City
Michael Rooney
Lonnie Willis
William Holstead
Dain Stephens
Alex Evert
Dennis Wright
W. M. Wright
Clayton Janicke
Adam Deeds
John Deeds
David Hendricks
Kale Yonker
Brooks Brown

HOXIE (60 signed in)

Questions:

If SD 6 re-ups will they keep their flexibility?

What about restricting the well at the Sheridan Lake?

How many AF do they have?

Who came up with the 12 g/h/d?

Why did you go on a township level instead of individual wells?

How many acres does each observation well cover?

How and when will you know it's working?

How many wells in SD 6?

How do the declines compare to outside of SD 6?

What happens when SD 6 re-ups?

How many townships in SD 6?

Does 5 years give you enough time to readjust if it's not working?

Are you going to get tougher if there is still a decline?

There's not much irrigation in my red township, but there is a huge feedlot and ethanol plant. Have you taken this into account?

How many other hot spots (HPA) are there in the district?

Can you buy water rights like you can in SD 6?

After 5 years what's the plan?

Does the amount I've historically pumped affect me?

If we don't do something now, will the state come in later?

Comments:

The data is inaccurate.

If SD 6 can do it then it should be district-wide.

I want out of the district.

I have issues with tax payers paying for the building and supplying money to the Foundation.

We need to educate the people in town on the water problem.

You can't wait another 20 years to solve this problem.

I testify the LEMA is working. The farm management improves.

The probes, and other technology work.

Please Sign in Hoxie

John Lindenman

Shawn Lindenman

Mark Hill

Ginger Pugh KDA-DWR

Kelly Stewart

Ken Watkins

Nick Hixon

Dal Bowman

Matt Palmgren

Edward Gaskell

Neil Bearnd

Randall Youkin

Ray Slipke

Bob Swenson

Nathan Abt

Harold Mingley

[illegible]

Jerry McKenna

Kevin Lager

Ed [illegible]

Tom [illegible]

Wade Tremblay

Shane Beckman

Randy Ochs

Paul Barnes

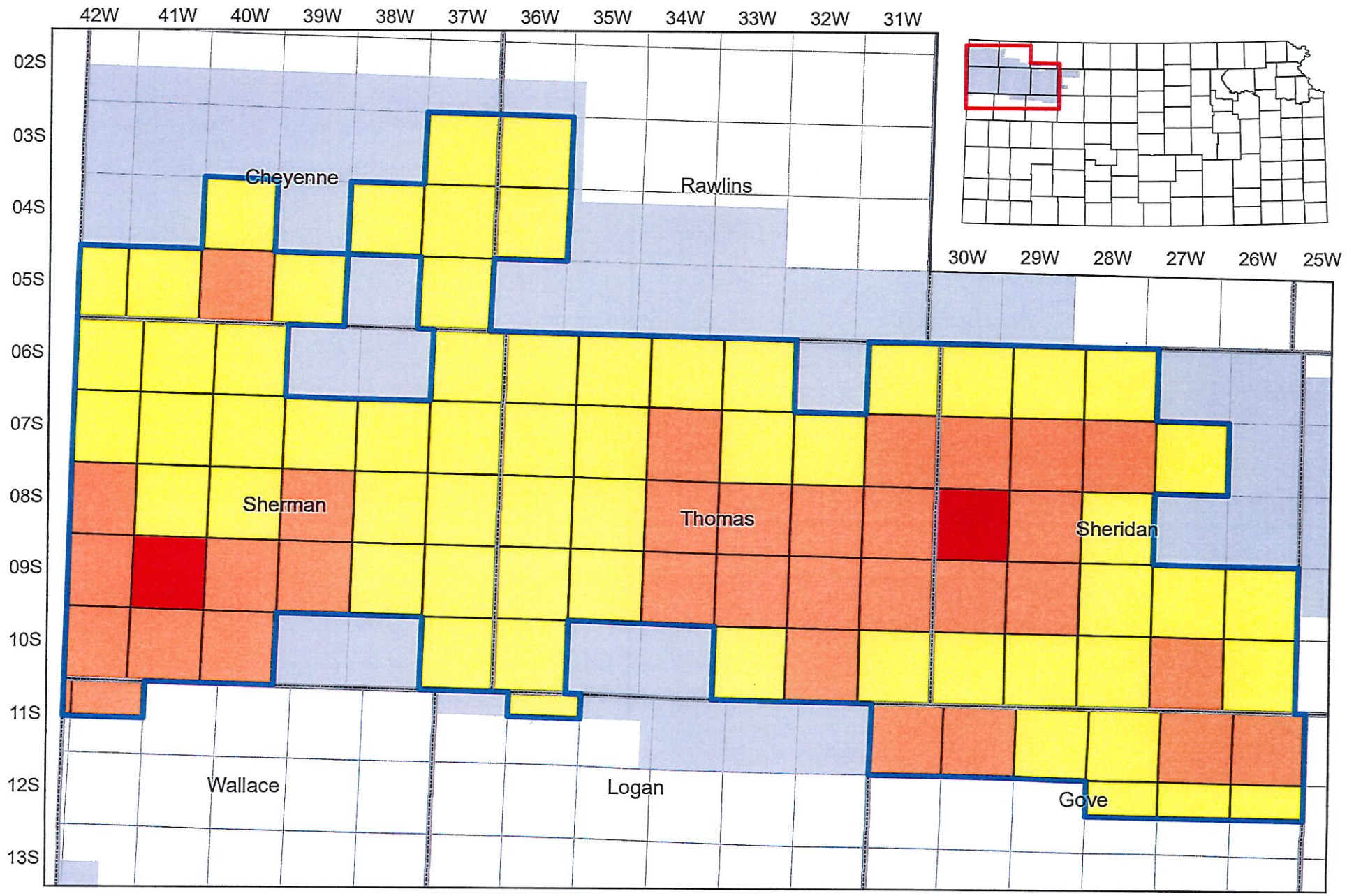
[illegible]

Lenny Palmer

Pat Herl Hoxie
Rick Moss Hoxie
Don Moss Hoxie
Harold Foster "
Rick Gillespie Grinnell
Mike McKenna

GMD No. 4 District-Wide LEMA

Exhibit 3



LEMA Boundary

GMD

Average Annual Decline (2004-2015)

0.5 - 1%

1 - 2 %

2% +

N

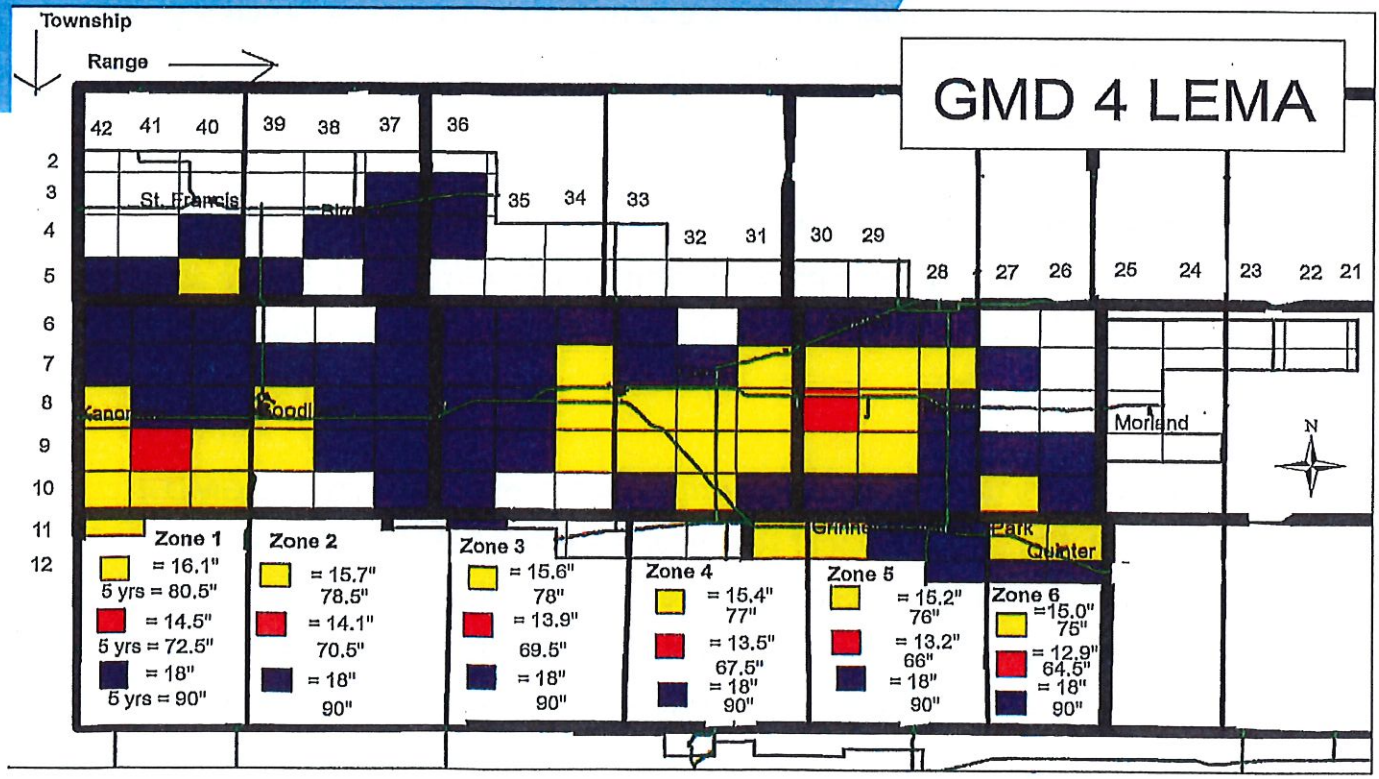
0 6 12 18 Miles

Kansas Department of Agriculture
Division of Water Resources
April 13, 2018

Exhibit 4a

GMD 4

GMD 4 LEMA Annual Report and Formal Review



Townships with 2%+ Average Annual Decline In 2004-2015

Townships with 1-2% Average Annual Decline In 2004-2015

Townships with 0.5 - 1% Average Annual Decline In 2004-2015 (18 inch allocation; 5 years = 90 inches)

Prepared by Shannon Kenyon GMD 4

GMD 4 Local Enhanced Management Area – LEMA

The GMD 4 LEMA continues its third year of the 5 year allocation program set to continue through December 31st of 2022. There are 94 townships, or parts of townships with the GMD 4 district boundaries that continue with water restrictions within the GMD 4 LEMA.

As required in the Order of Designation Approving the GMD 4 Local Enhanced Management Area Within Groundwater Management District No. 4 the "Advisory Committee shall also conduct a more formal review of the LEMA Order 1.5 years prior to the ending date of the LEMA".

The following report will include summaries of the May 12th, 2021 GMD 4 LEMA Advisory Committee Meeting, and will provide additional information fulfilling all requirements as stated in the Order including the final 2020 water use data for the LEMA.

The GMD 4 LEMA Advisory Committee made official recommendation to the GMD 4 Board of Directors and the Chief Engineer to renew the GMD 4 LEMA with the same conditions as the 2018-2022 LEMA. If changes are made, they recommend to use the 2004-2020 section-level data for declines. They also recommend no carryover and to include a clause about most restrictive when irrigation is converted to other use types.

MINUTES
GMD 4 LEMA Advisory Committee Meeting
May 12th, 2021
10:00 AM, Colby, Kansas

Those in attendance: Dan Stephens, Dave Wieland (online), Dwayne Kersenbrock, Tyler Remington, Mitchell Baalman, Dave Rietcheck, Bill Miller, Michael Juenemann, Rebecca Hageman (DWR), Kelly Stewart (DWR), Kelly Navinsky Werzl (DWR) & Shannon Kenyon

Shannon Kenyon noted that copies of all the data to be presented were mailed to all members. Jace Mosbarger's packet was returned.

1. Water Use Data
   Shannon directed the group to the packet mailed to them. The first sets of data show water use by region in the district for years 2016-2020. The year 2020 was the driest of those years as indicated on the precipitation chart. Although pumping was up in most areas, most did not exceed what they pumped in 2016. Discussion was had on how helpful soil moisture probes have been to those that have them.

2. Water Table Information
   A spreadsheet was provided in the mailed materials showing each township within the district, what their decline was for the 2018-2022 LEMA, what the decline is if average annual decline for 2004-2020 is, and also 2011-2020. Shannon noted that there are some numbers that are drastic in the 2011-2020 data as more observation wells were added. Overall, the average annual declines have decreased. Based on that decline data two maps were also mailed to show the district decline township colors. The first was using the 2004-2020 average annual decline and the second was for 2011-2020. A map of the current 2018-2022 LEMA map was used for reference.

3. Economic Data

Economic data is not available at this time as a proposed study is unknown.

4. Violations
   Shannon noted to the group that the violation is a 2-year suspension. Most producers are sitting fine and don't need to worry however there have been a few producers she talked to that have misunderstood and thought they could overpump their water right, just not go over the 5 year quantity.

5. New and Preferable Enhancement Management Options
   Shannon directed the committee to the questions outlined on the memo mailed to them. She first asked if the GMD 4 BOD should continue the LEMA. Everyone agreed that the GMD 4 LEMA should continue.
   What years to include in computing the average annual decline? Since the LEMA is still new, using the same baseline of 2004 was preferred.
   Any adjustments to LEMA allocations per color of township? For example, if a township went from purple to no color and more pumping resumes, is the decline problem going to return? The committee did not think any adjustments needed to be made. They suggest keeping everything the same as it is for 2018-2022. Too little time frame to make adjustments and they want to avoid confusion. Bill Miller made a suggestion to the group of a different plan to charge for water and giving money to those that don't. Most thought it was an interesting concept.
   Should the green townships be included this time? No, don't change it.
   Should there be less or more reductions? No, don't change it.
   Should stockwater, municipal, and recreation rights be included? There should be a clause about irrigation conversion to another use type in being most restrictive.
   Violation changes? No
   Carryover? It's not as restrictive as SD-6 so no. If there is a carryover then there needs to be a reduction in quantity so that declines continue to slowly improve.

Recommendation to the GMD 4 Board of Directors: Continue LEMA as is. If changes are made, use the 2004-2020 data set. Do not add green townships. No carryover and include a clause about irrigation conversion to other use types.

6. Other Items
   Shannon discussed the two pending lawsuits. The one in Gove County was ruled in our favor and it was dismissed by the Petitioners. The Carpenter case is still sitting on a judge's desk. We have asked to dismiss it but no action has been taken. It may just expire when the current LEMA expires.

NORTHWEST KANSAS GROUNDWATER MANAGEMENT DISTRICT NO. 4

PO Box 905
1290 West 4th
Colby, KS 67701-0905
(785) 462-3915

MEMORANDUM

DATE: April 28, 2021
FROM: Shannon Kenyon
RE: GMD 4 Advisory Committee Meeting
TO: GMD 4 Advisory Committee Members

Hello GMD 4 Advisory Committee Members,
It is that time of year again to meet and discuss the GMD 4 LEMA. This year is an important one as we need to make recommendations to the GMD 4 Board of Directors on a new 2023 – 2027 GMD 4 LEMA. I have enclosed a map of the current LEMA, water use in inches/acres broken down by region, and a spreadsheet showing each township within GMD 4 and their average annual percent decline for the current LEMA and two different year averages going to year 2020. Precipitation for the four largest counties are also included for years 2016 – 2020.

The last two maps in the packet is what the GMD 4 LEMA numbers are today if we renew with the same plan. The map that says "2004 – 2020" uses the same beginning year of 2004 as the 2018-2022 GMD 4 LEMA. The second map that says "2011-2020" uses the decline data for the more recent set of 10 years. In the GMD 4 LEMA map currently in place there are no green townships as I have put on the newest maps. Those green townships have a decline but it is less than 0.5%. As with the original map, the red townships have an average annual decline greater than 2%, the yellow townships have an average annual decline of 1 – 2%, and the purple townships have a decline of 0.5 – 1%.

Here are a few questions we need to discuss and make recommendation to the GMD 4 Board if the Advisory Committee feels the GMD 4 LEMA should be renewed:

- What years to include in computing the average annual decline? 2004 – 2020 or 2011-2020?
- Any adjustments to LEMA allocations per color of township? For example, if a township went from purple to no color and more pumping resumes, is the decline problem going to return?
- Should the green townships be included this time?
- Should there be less or more reductions?
- Should stockwater, municipal, and recreation rights be included?
- Violation changes?
- Anything else anyone feels needs answered and discussed.

There is a lot to cover this year as we have to make recommendation to the GMD 4 Board of Directors and provide a report with the recommendation to the Division of Water Resources no later than 18 months prior to the GMD 4 LEMA renewal.

Please note that the meeting will be in person this year but have made it available online for those that cannot physically attend. I do understand this is a busy time of year. The link and call in number is at the top of the agenda if you chose to attend online or by telephone. Not to bribe anyone but for those in attendance at the office, we will have cinnamon rolls or donuts!

Let me know if you have any questions and thank you for your time on this very important committee.

ANNUAL GMD 4 LEMA ADVISORY COMMITTEE MEETING
10:00 AM CDT
Wednesday, May 12th, 2021

@GMD 4 Office
Or online:
Please join my meeting from your computer, tablet or smartphone.
https://global.gotomeeting.com/join/241914229

You can also dial in using your phone.
United States (Toll Free): 1 866 899 4679
United States: +1 (571) 317-3116

Access Code: 241-914-229

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https://global.gotomeeting.com/install/241914229

i. Water use data

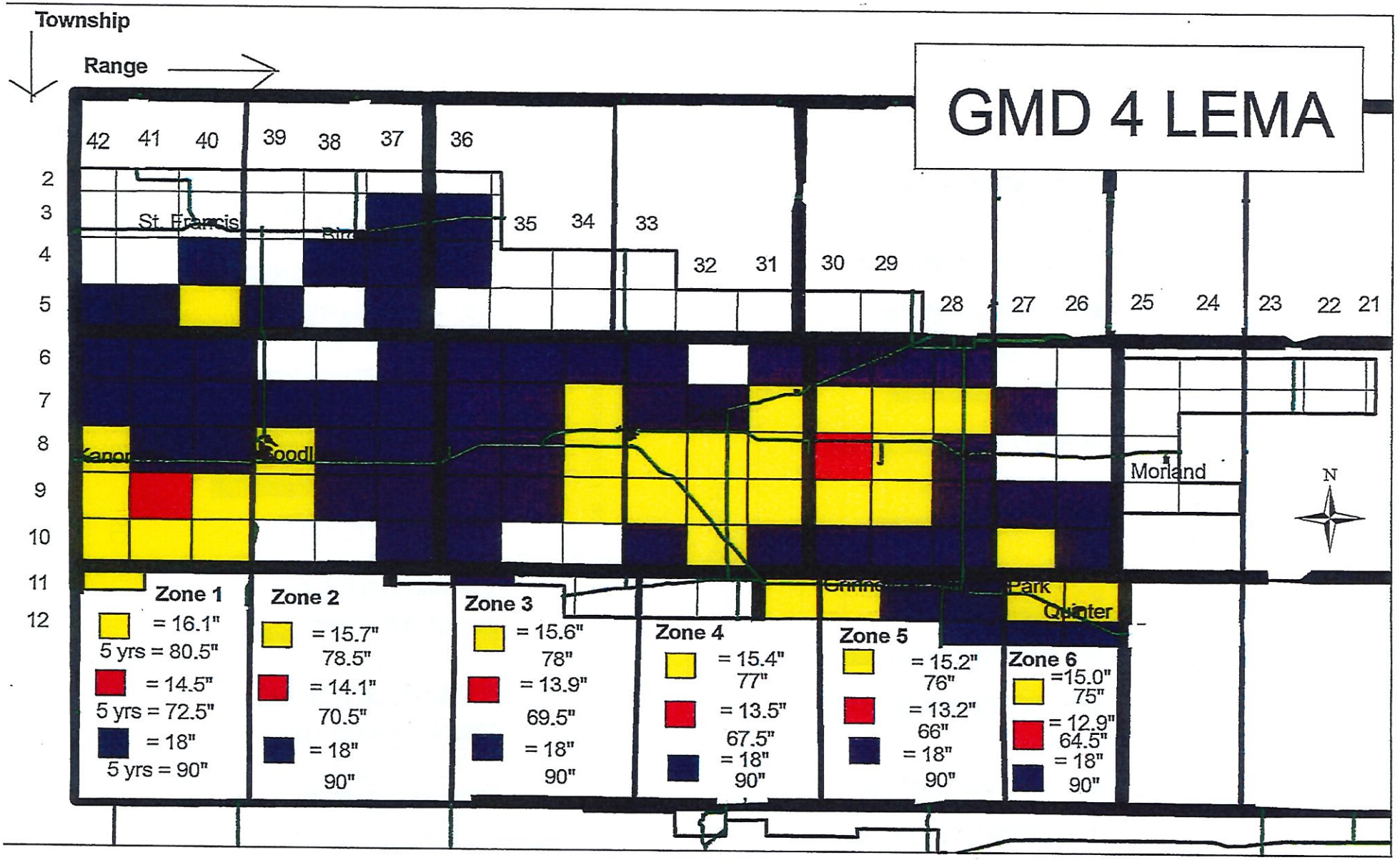
ii. Water table information

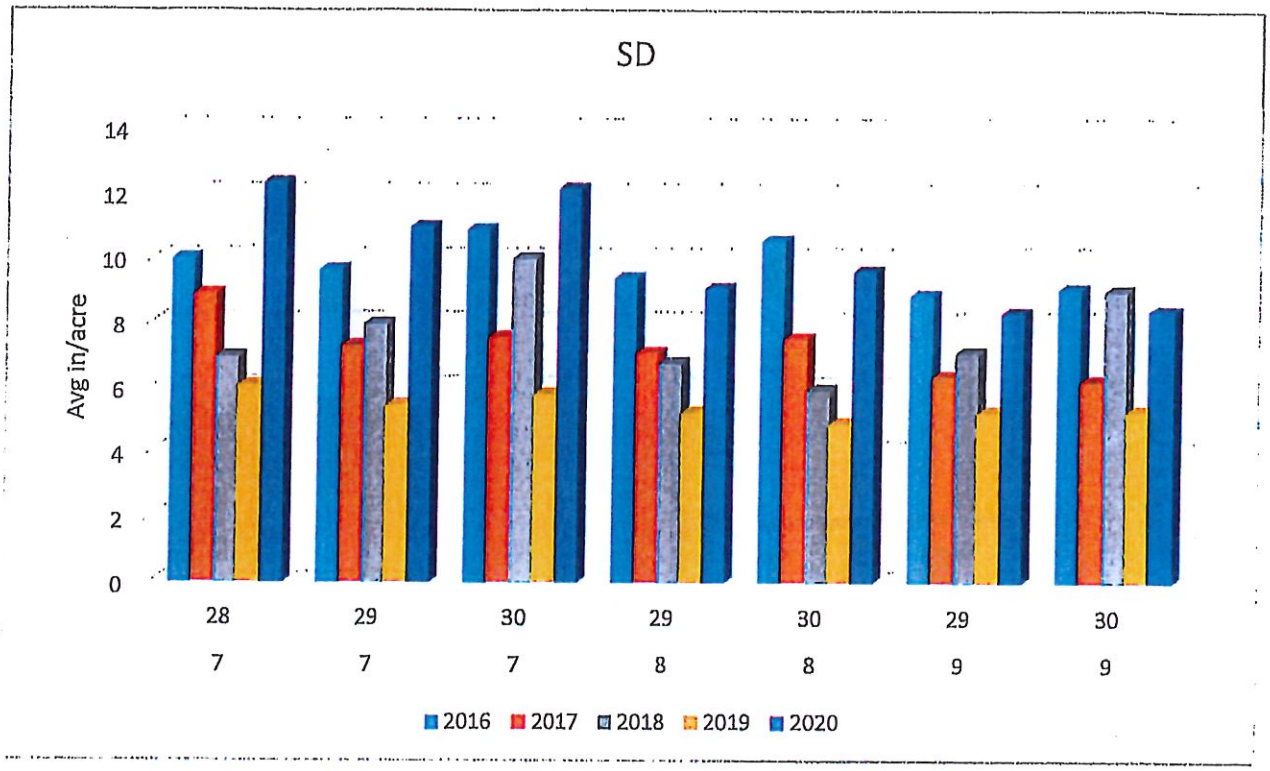
iii. Economic data

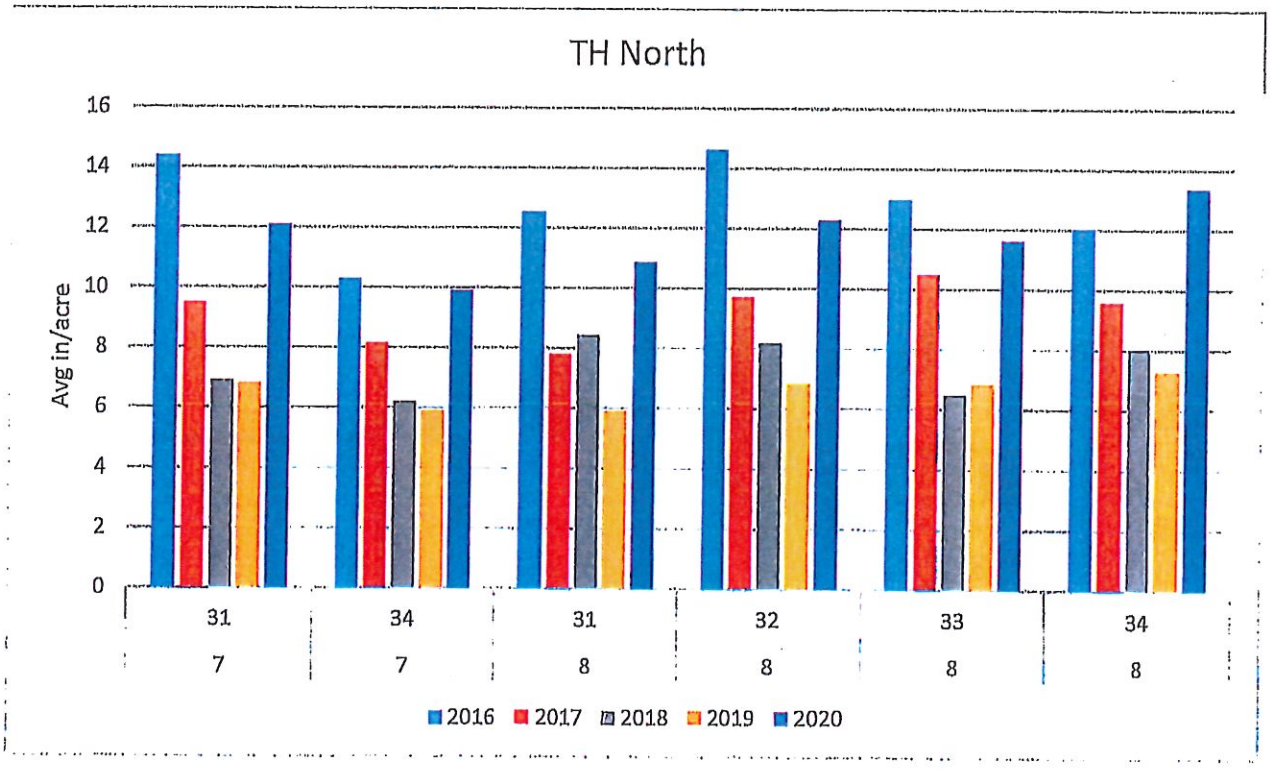
iv. Violations, issues relating to violations, and metered data that relates to violations

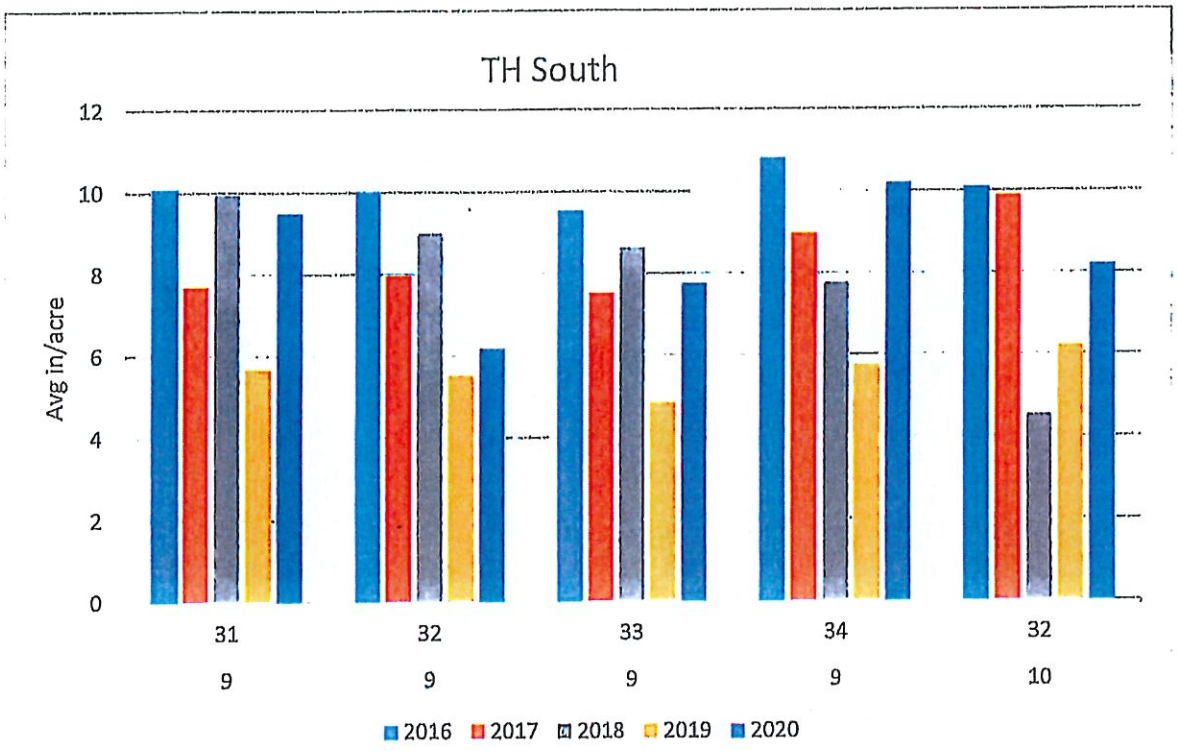
v. New and preferable enhancement management options
LEMA renewal and recommendation to the GMD 4 Board of Directors

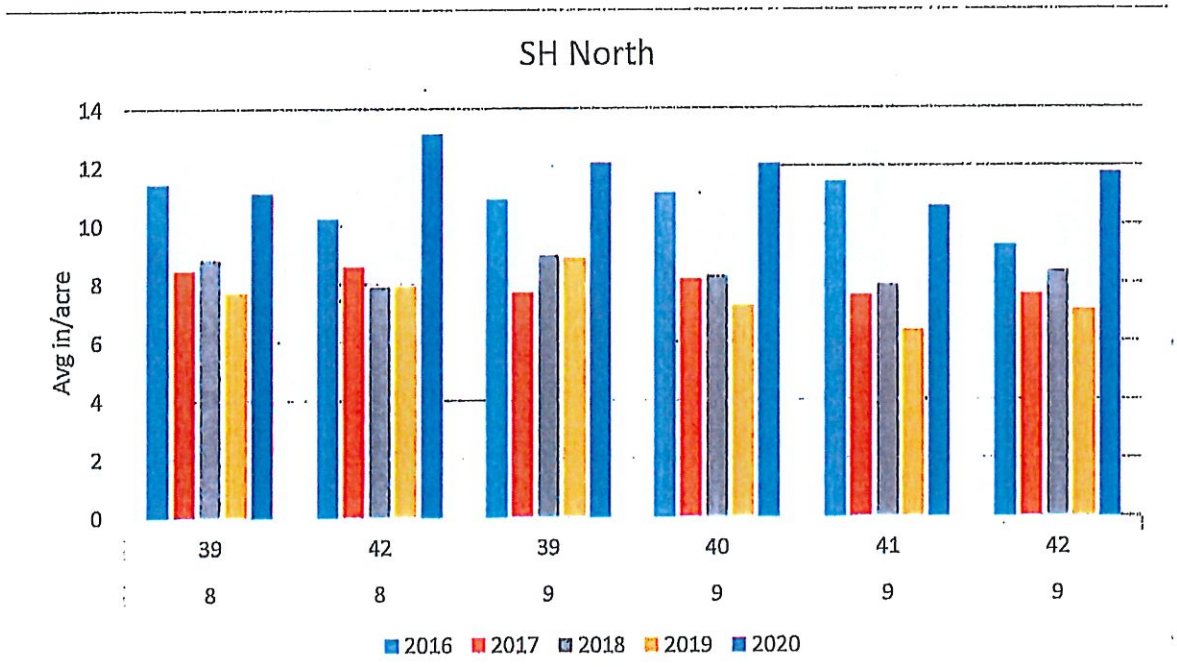
vi. Other items
Lawsuits Update

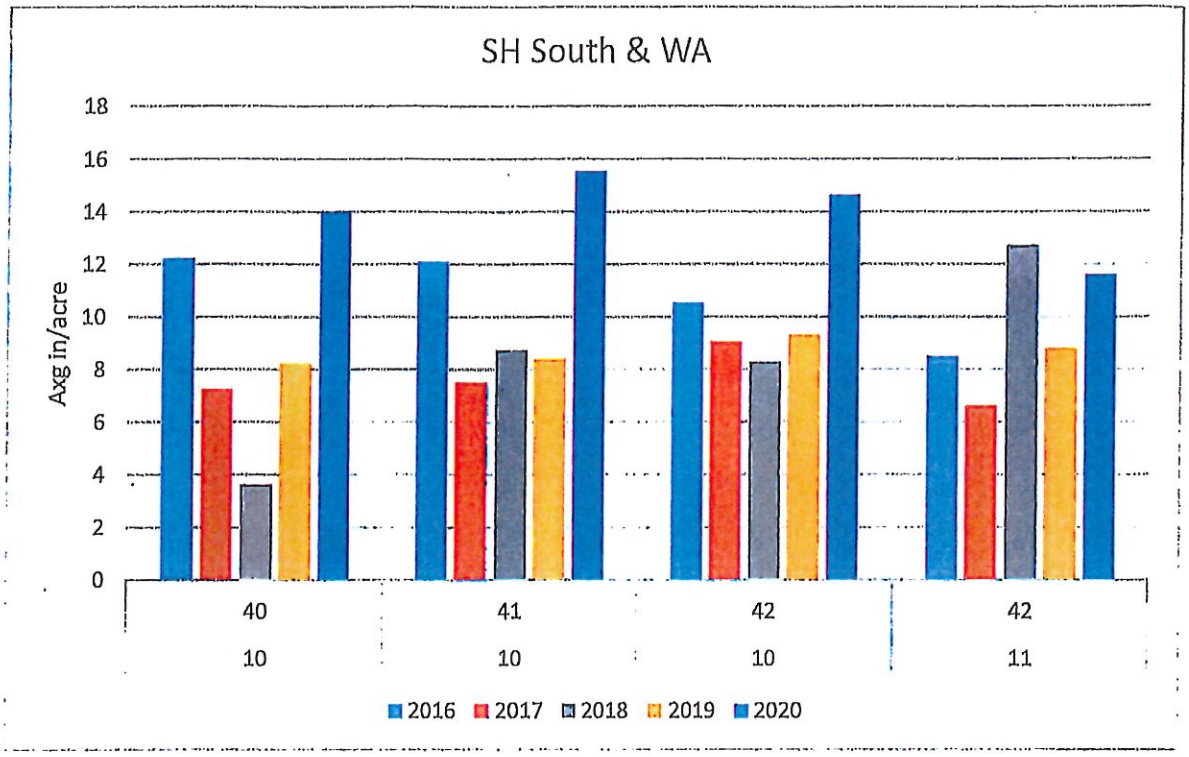

Township
Range
GMD 4 LEMA
42 41 40 39 38 37 36
2 3 4 5 6 7 8 9 10 11 12
35 34 33 32 31 30 29 28 27 26 25 24 23 22 21
St. Francis
Morland
N
Zone 1
= 16.1"
5 yrs = 80.5"
= 14.5"
5 yrs = 72.5"
= 18"
5 yrs = 90"
Zone 2
= 15.7"
78.5"
= 14.1"
70.5"
= 18"
90"
Zone 3
= 15.6"
78"
= 13.9"
69.5"
= 18"
90"
Zone 4
= 15.4"
77"
= 13.5"
67.5"
= 18"
90"
Zone 5
= 15.2"
76"
= 13.2"
66"
= 18"
90"
Zone 6
=15.0"
75"
= 12.9"
64.5"
= 18"
90"
Townships with 2%+ Average Annual Decline in 2004-2015
Townships with 1-2% Average Annual Decline in 2004-2015
Townships with 0.5 - 1% Average Annual Decline in 2004-2015 (18 inch allocation; 5 years = 90 inches)
Prepared by Shannon Kenyon GMD 4

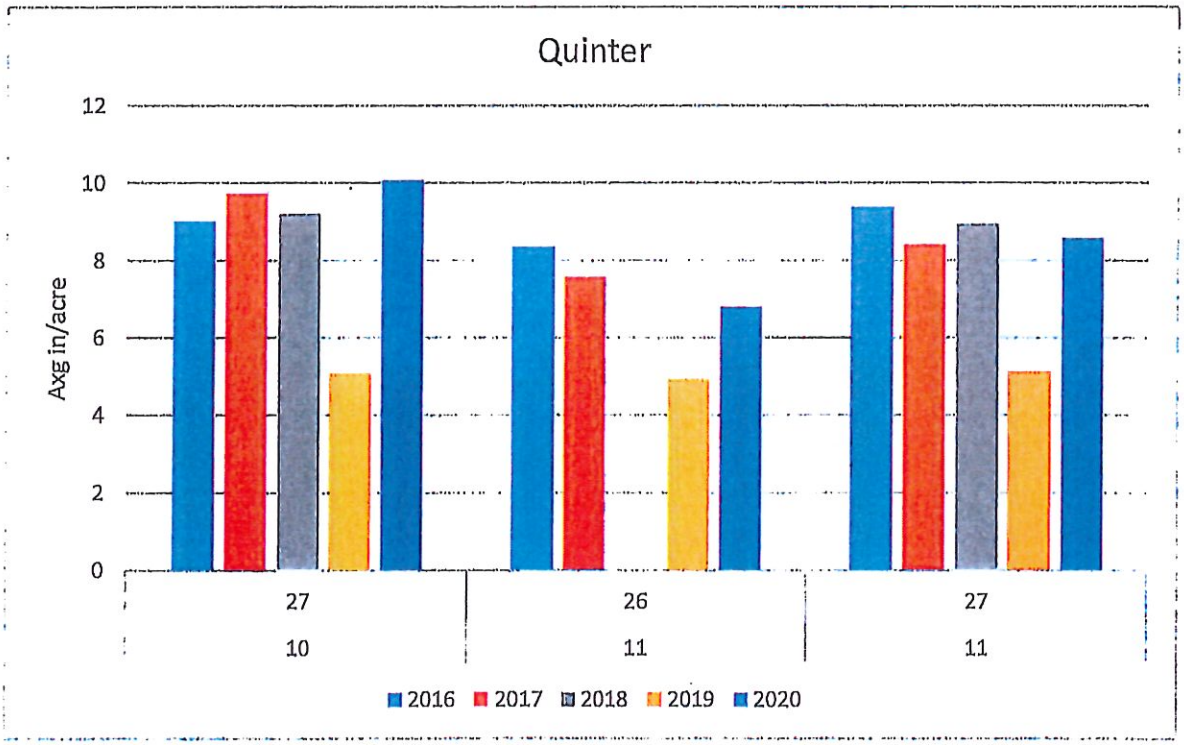

SD
Avg in/acre
14
12
10
8
6
4
2
0
28
7
29
7
30
7
29
8
30
8
29
9
30
9
2016
2017
2018
2019
2020

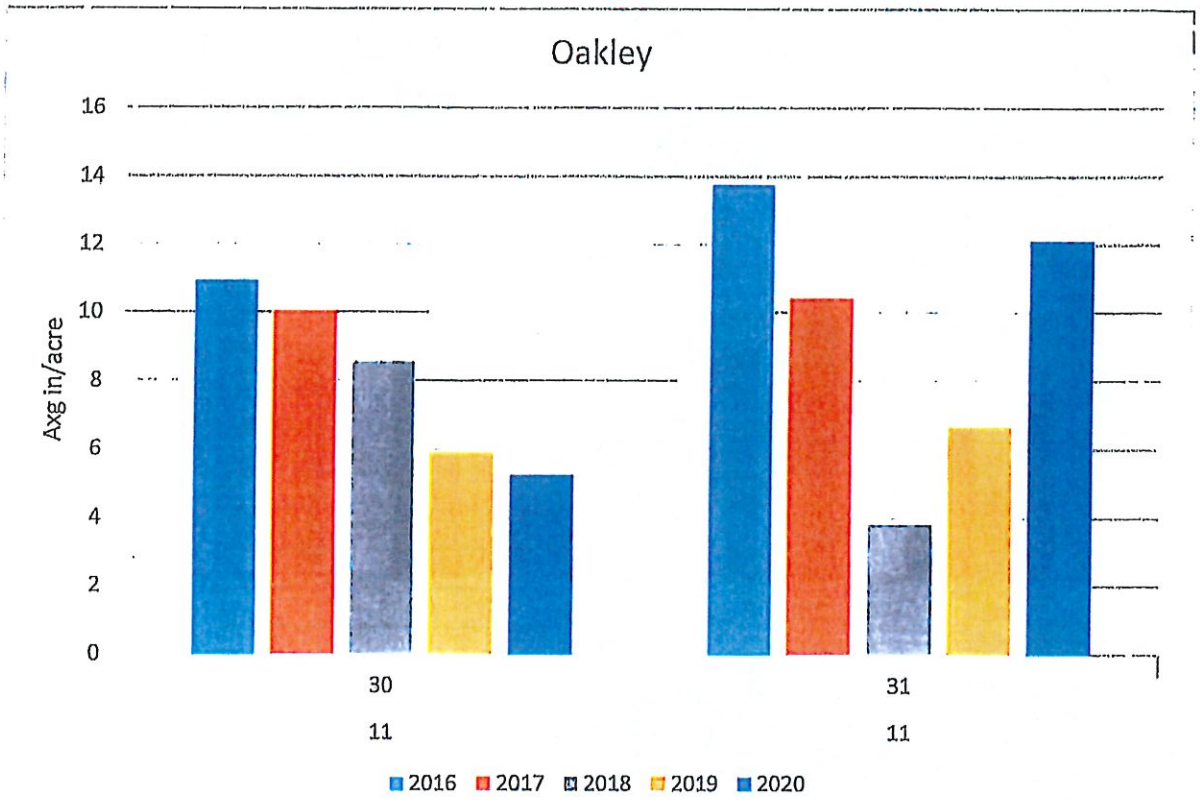

TH North
Avg in/acre
16
14
12
10
8
6
4
2
0
31
7
34
7
31
8
32
8
33
8
34
8
2016
2017
2018
2019
2020

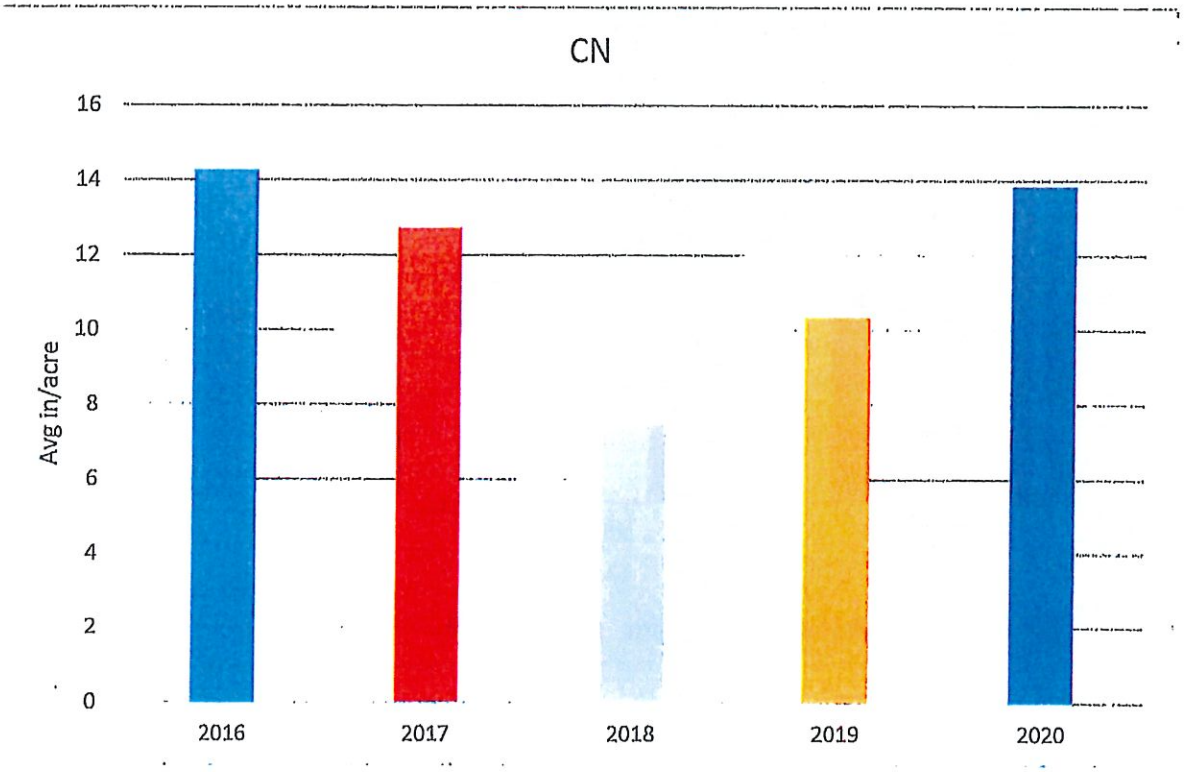

TH South
Avg in/acre
12
10
8
6
4
2
0
31
9
32
9
33
9
34
9
32
10
2016
2017
2018
2019
2020


SH North
Avg in/acre
14
12
10
8
6
4
2
0
39
8
42
8
39
9
40
9
41
9
42
9
2016
2017
2018
2019
2020


SH South & WA
Axg in/acre
18
16
14
12
10
8
6
4
2
0
40
10
41
10
42
10
42
11
2016
2017
2018
2019
2020


Quinter
Axg in/acre
12
10
8
6
4
2
0
27
10
26
11
27
11
2016
2017
2018
2019
2020


Oakley
16
14
12
10
8
6
4
2
0
Axg in/acre
30
11
31
11
2016
2017
2018
2019
2020


CN
16
14
12
10
8
6
4
2
0
Avg in/acre
2016
2017
2018
2019
2020

TWP	18-22 LEMA	04-20 AVG %	11-20 AVG %			
02S35W	0.246302128	0.004083005	0.200378511		No Decline	
02S36W	0.39467133	-0.079459229	0.323952215		0-0.5% Decline	
02S37W	0.279587965	-1.228957526	0.270988998		0.5-1% Decline	
02S38W	0.262380942	-27.90195524	0.304900414		1-2% Decline	
02S39W	0.419215174	-16.91154923	0.076178911		2% + Decline	
02S40W	-0.501841848	-3.600094933	-0.44618622			
02S41W	-0.971260316	-9.449772258	-0.101033459			
02S42W	0	0	0			
03S35W	0.359002228	0.048289443	0.319490533			
03S36W	0.619885832	0.48829561	0.541697926			
03S37W	0.639568323	0.391285728	0.385320581			
03S38W	0.431351942	0.242395654	0.406829114			
03S39W	0.420239288	-0.810962851	0.23665231			
03S40W	-0.018263004	-11.40835894	-0.002535751			
03S41W	-0.888279759	-11.25970944	0.1100934			
03S42W	-0.108497246	-11.08751968	0.402346845			
04S33W	0.157531399	-0.274214446	0.140435498			
04S34W	0.246953431	-2.326572493	0.176657721			
04S35W	0.038904202	-0.567778575	0.161593772			
04S36W	1.1477362	0.896409864	0.946808151			
04S37W	0.751272555	0.521774258	0.494661939			
04S38W	0.520106384	0.372709521	0.38527155			
04S39W	0.452112603	0.328314279	0.305685082			
04S40W	0.767580344	-0.946164455	0.429645235			
04S41W	0.412841269	-2.978795455	0.365637949			
04S42W	0.115178351	-0.342151077	0.302714811			
05S29W	-0.427681038	-10.82646684	0.38722665			
05S30W	-0.037769707	-0.363167898	0.209116879			
05S31W	-1.054658403	-2.084725247	0.766115386			
05S32W	0.077397969	-0.096365443	0.199478605			
05S33W	0.236516894	0.226069961	0.203238237			
05S34W	0.279512311	0.354001199	0.245879511			
05S35W	0.286450708	0.185802506	0.24365561			
05S36W	0.445160546	0.3502937	0.344129606			
05S37W	0.497118272	0.426304797	0.414617523			
05S38W	0.475474588	0.396884424	0.399679896			
05S39W	0.587888743	0.518977034	0.443399828			
05S40W	1.007508956	0.709328481	0.594648994			
05S41W	0.865603854	0.642030681	0.755806169			
05S42W	0.644377897	0.438574103	0.778850702			
06S21W	-0.459304271	-2.475321674	-0.352585772			
06S22W	-0.170935714	-1.12452172	-0.185122896			
06S23W	-0.194345489	-0.586760835	-0.282540639			
06S24W	-0.119279274	-0.676559881	-0.438343206			
06S25W	0.040536136	-0.493051926	-0.123650721			
06S26W	0.118266425	-1.321345985	-0.033181107			

06S27W	0.238517133	-0.413623036	0.136109024			
06S28W	0.690194986	0.509584079	0.400272236			
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06S35W	0.518458691	0.322181944	0.347443411			
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06S40W	0.657810636	0.525064688	0.485224978			
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07S21W	-0.400160142	-1.540111111	-0.201094941			
07S22W	-0.052488102	-0.573397128	-0.139771529			
07S23W	-0.050158577	-0.597079333	-0.087334268			
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07S27W	0.793727213	0.456184305	0.490993228			
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11S37W	0.388701758	-0.230423045	0.191598588			
11S42W	3.083024443	2.262815692	2.974184217			
11S43W	0	0	0			
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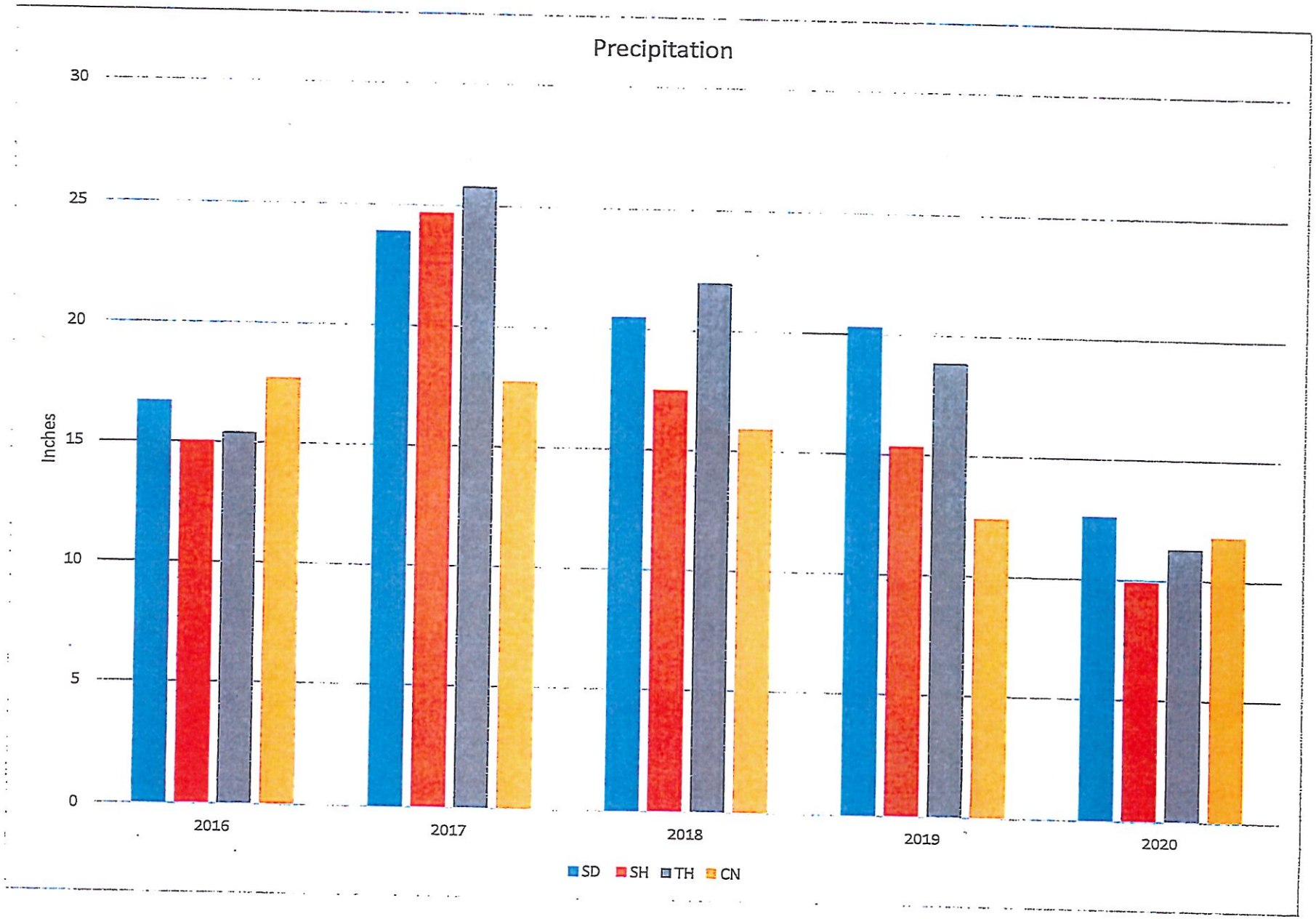
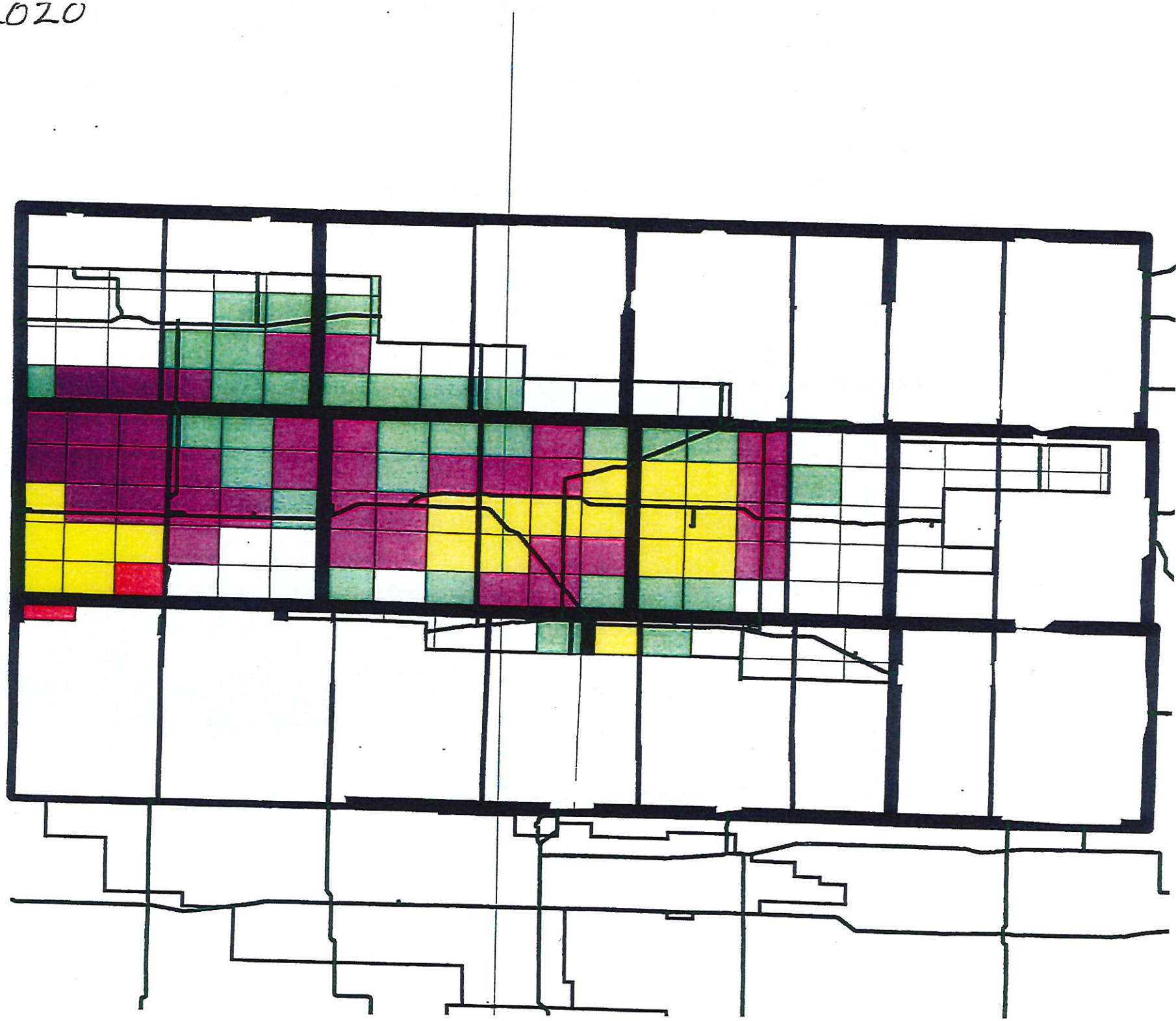

Precipitation
30
25
20
15
10
5
0
Inches
2016
2017
2018
2019
2020
SD
SH
TH
CN

2004-2020



2011-2020

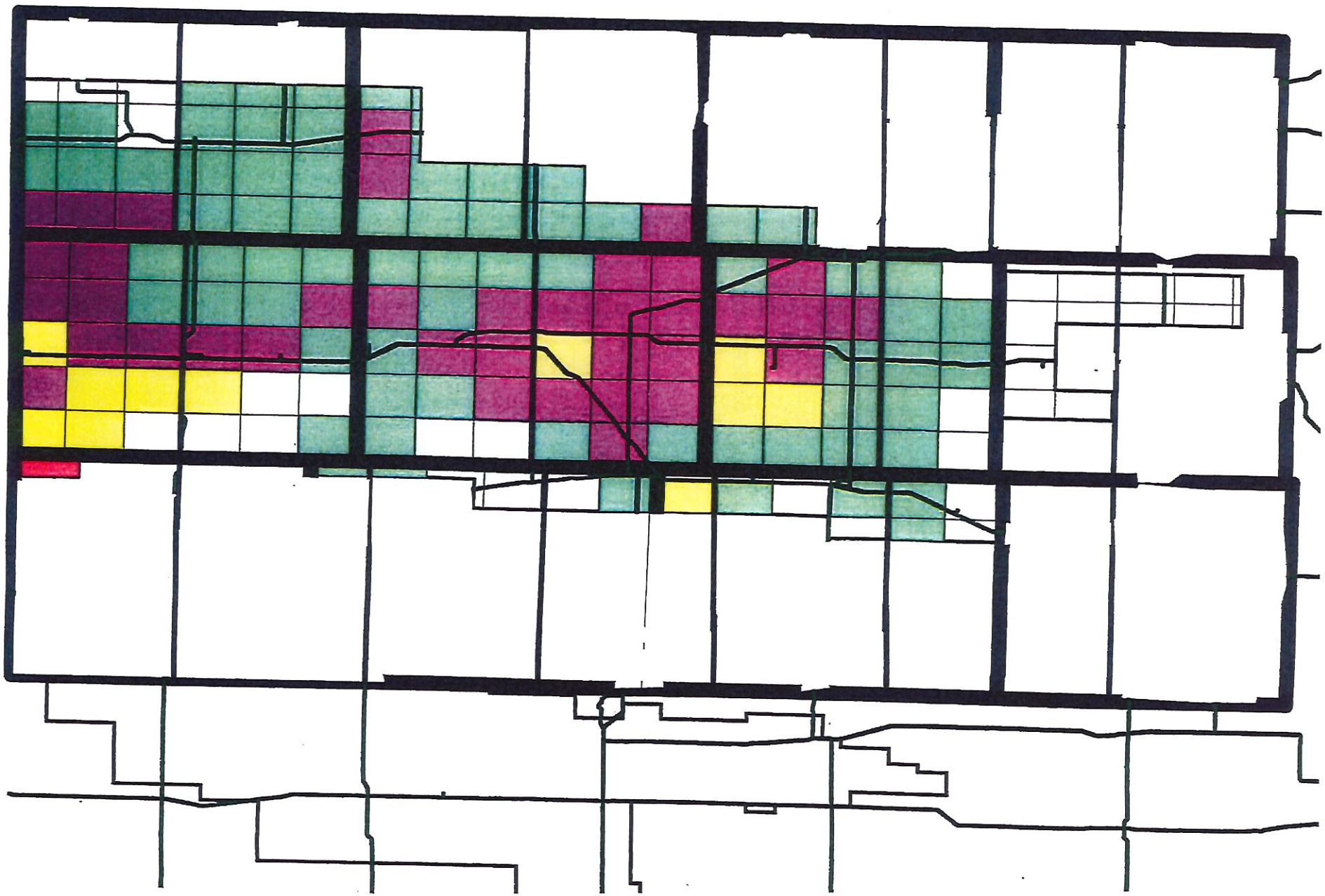
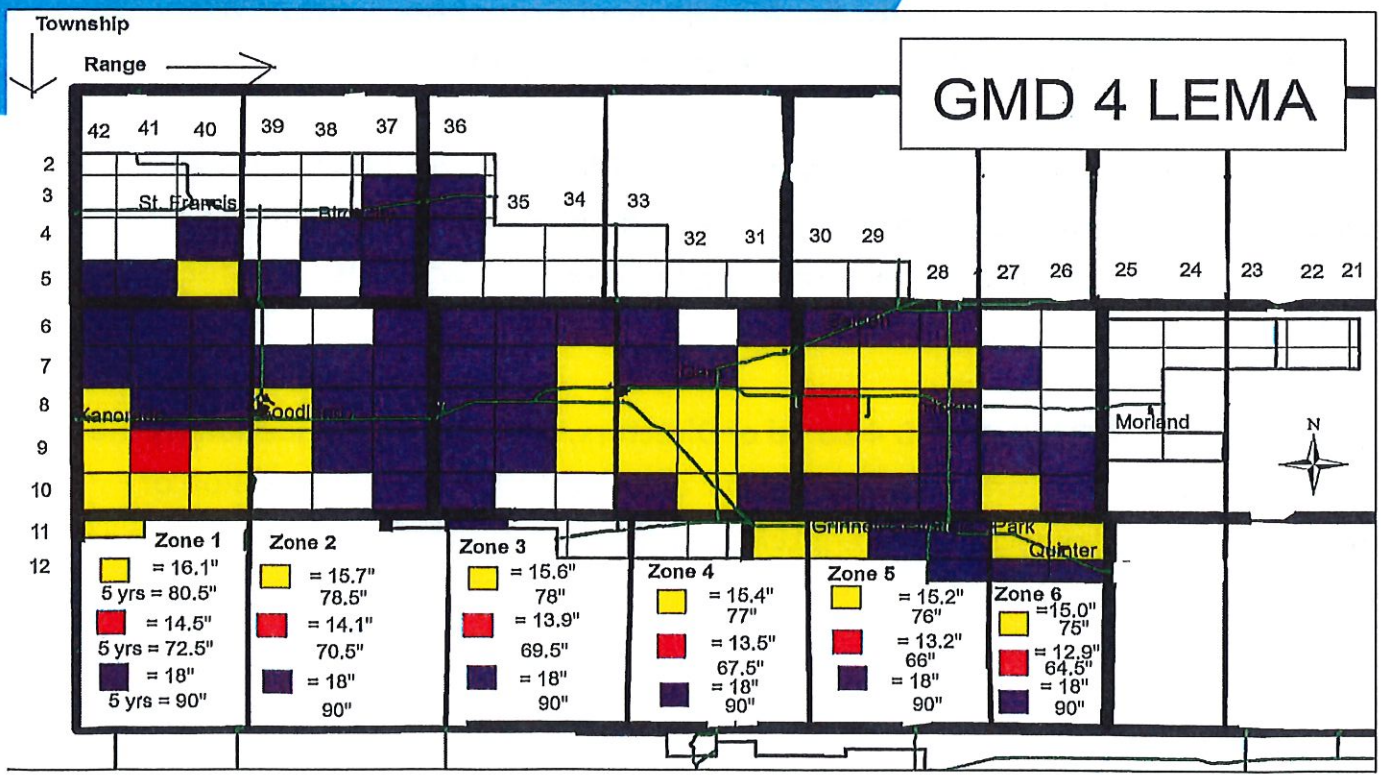


Exhibit 4b

GMD 4

GMD 4 LEMA Annual Report



Townships with 2%+ Average Annual Decline in 2004-2015

Townships with 1-2% Average Annual Decline in 2004-2015

Townships with 0.5 - 1% Average Annual Decline in 2004-2015 (18 inch allocation; 5 years = 90 inches)

Prepared by Shannon Kenyon GMD 4

GMD 4 Local Enhanced Management Area – LEMA

The GMD 4 LEMA continues its fourth year of the 5 year allocation program set to continue through December 31st of 2022. There are 94 townships, or parts of townships within the GMD 4 district boundaries that continue with water restrictions within the GMD 4 LEMA.

As required in the Order of Designation Approving the GMD 4 Local Enhanced Management Area Within Groundwater Management District No. 4, the Advisory Committee shall meet annually and provide an annual report.

The following report will include summaries of the May 11th, 2022 GMD 4 LEMA Advisory Committee Meeting, and will provide additional information fulfilling all requirements as stated in the Order, including the final 2021 water use data for the LEMA.

On February 16th, 2022, the GMD 4 Board of Directors, at the recommendation by the GMD 4 LEMA Advisory Committee, submitted an official request to the Division of Water Resources to renew the current LEMA with minor modifications.

MINUTES
GMD 4 LEMA Advisory Committee Meeting
May 11th, 2022
10:00 AM, Colby, Kansas

Those in attendance: Dan Stephens, Dwayne Kersenbrock, Dave Rietcheck, Rebecca Hageman (DWR), Colter Stoll (GMD 4)& Shannon Kenyon (GMD 4)

Shannon Kenyon noted that copies of all the data to be presented were mailed to all members.

1. Water Use Data
   Shannon directed the group to the packet mailed to them. The first sets of data show water use by region in the district for years 2016-2021. The year 2021 was an extremely dry year throughout the district. Although pumping was up in most areas, most did not exceed what they pumped in 2016.

2. Water Table Information
   The updated "Interpolated Change in Feet, Cooperative Water Level Network, 2021 to 2022" was reviewed. It was noted that despite a very dry year there were some places within GMD 4 that did have a rise in the water table. It was also noted how other parts of the aquifer are declining very quickly. County observation well data obtained from KGS was also reviewed showing water levels for a variety of observation wells for several of the counties within GMD 4.

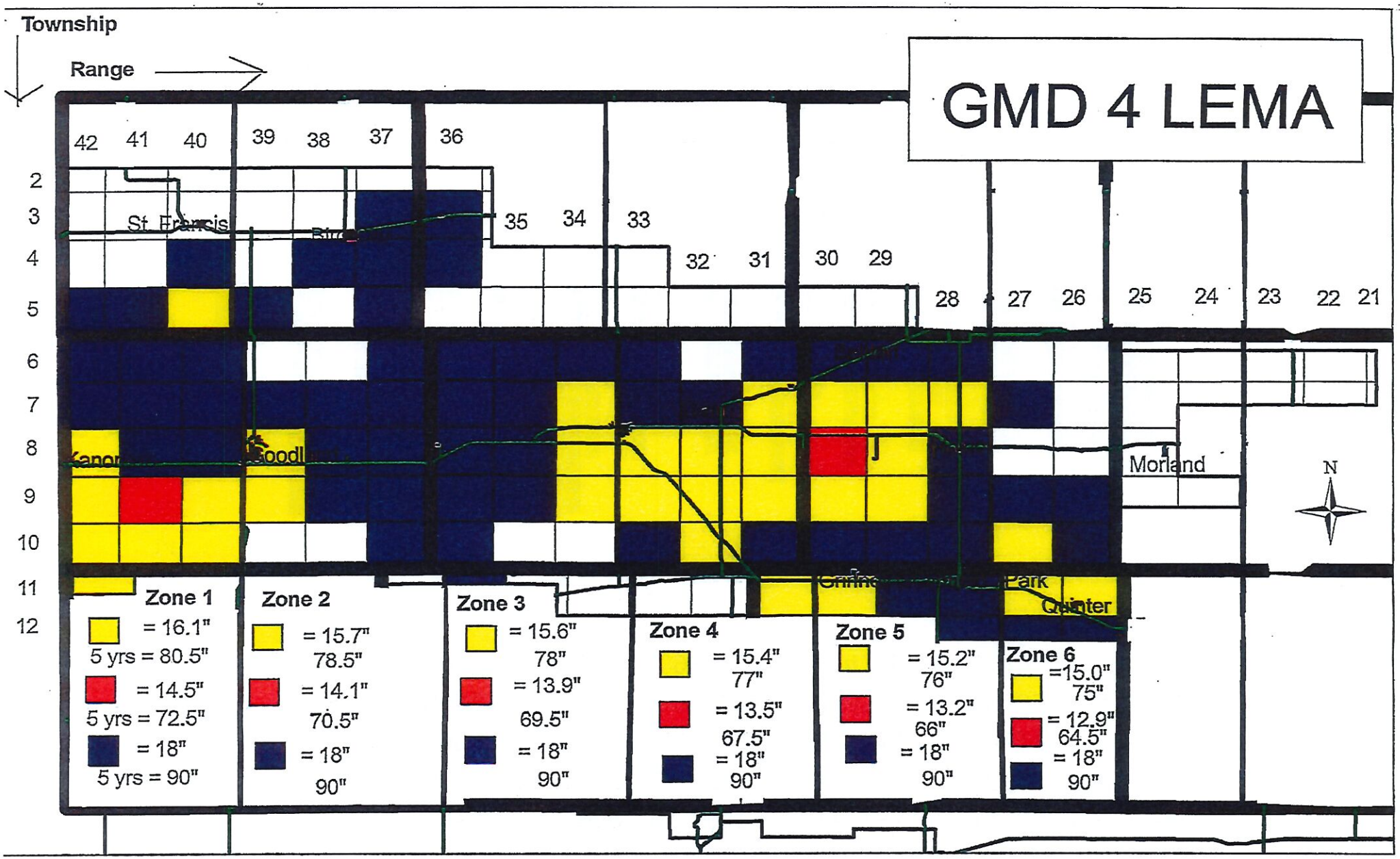
3. Economic Data
   Economic data is not available at this time as a proposed study is unknown. There is a study that will be conducted that will look at the GMD 4 LEMA and another water conservation area of interest in Colorado. Volunteers are requested to provide interviews.

4. Violations

The concern was brought up about being in year five of the GMD 4 LEMA and how several producers are still unaware they cannot overpump their water right. There is also concern going into the last year of the LEMA that there will not be a MYFA option to protect from overpumping.

5. New and Preferable Enhancement Management Options
   Nothing was noted other than there is a program through the Division of Conservation providing money for cost-share on a variety of water saving technology. The first program is over but another $100,000 specifically for GMD 4 will open on July 1st.

6. Other Items
   Shannon stated that the renewal request had been sent to DWR. We are waiting on hearing date(s) to be set. She also gave an update on legislative issues that occurred last session and there are a lot of unknowns going into 2023 with it being an election year.



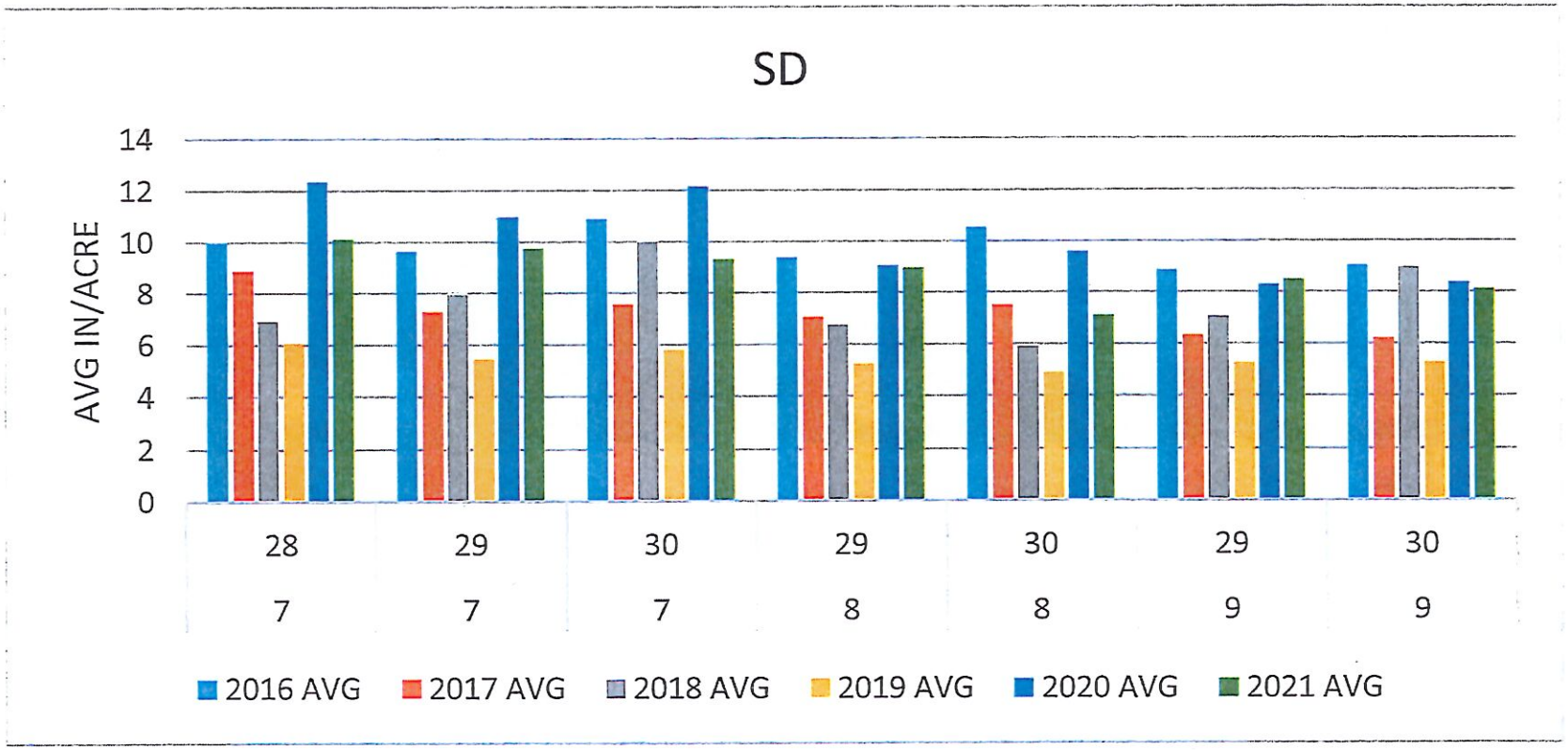
Townships with 2%+ Average Annual Decline in 2004-2015

Townships with 1-2% Average Annual Decline in 2004-2015

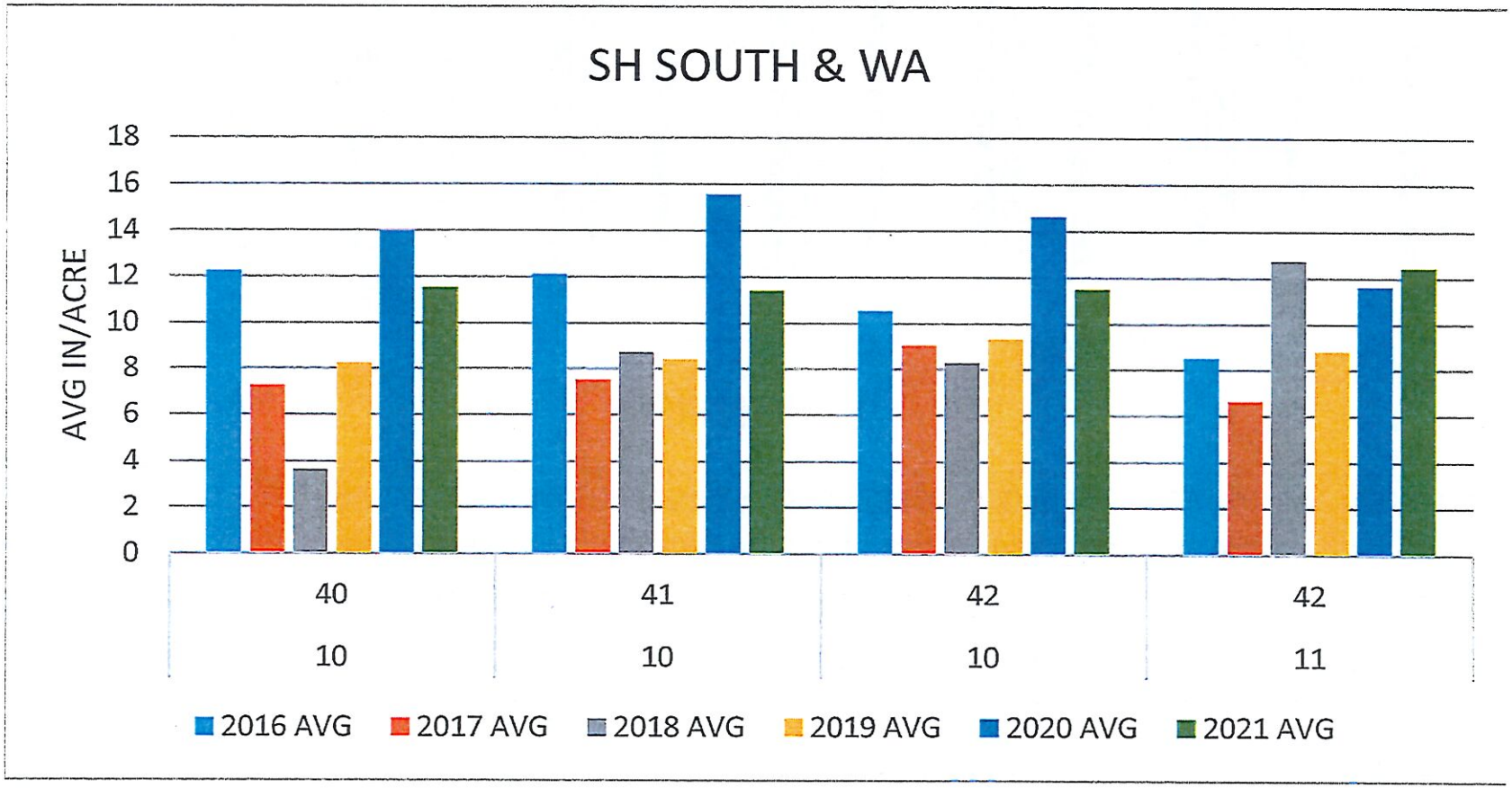
Townships with 0.5 - 1% Average Annual Decline in 2004-2015 (18 inch allocation; 5 years = 90 inches)

Prepared by Shannon Kenyon GMD 4

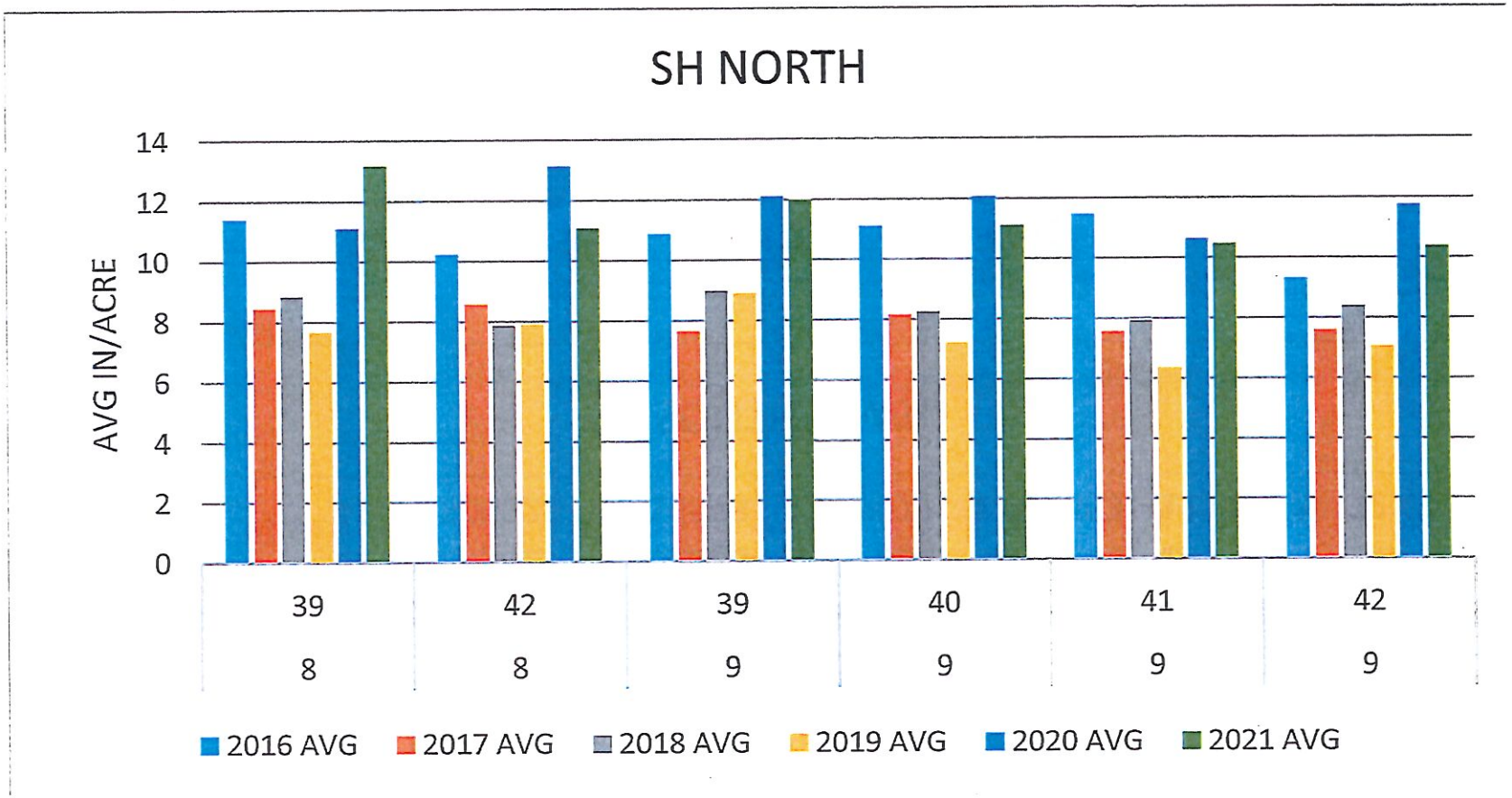
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
7	28	9.970226	8.849791	6.91828	6.037144	12.32884	10.10882
7	29	9.640405	7.27532	7.93794	5.426182	10.95565	9.730281
7	30	10.87315	7.537952	9.973205	5.771753	12.14105	9.307254
8	29	9.37031	7.050245	6.737572	5.217476	9.046202	8.950929
8	30	10.53996	7.492208	5.906565	4.876244	9.579117	7.094787
9	29	8.846436	6.31738	7.064096	5.228571	8.278069	8.477816
9	30	9.033945	6.182023	8.966857	5.24719	8.361497	8.101656



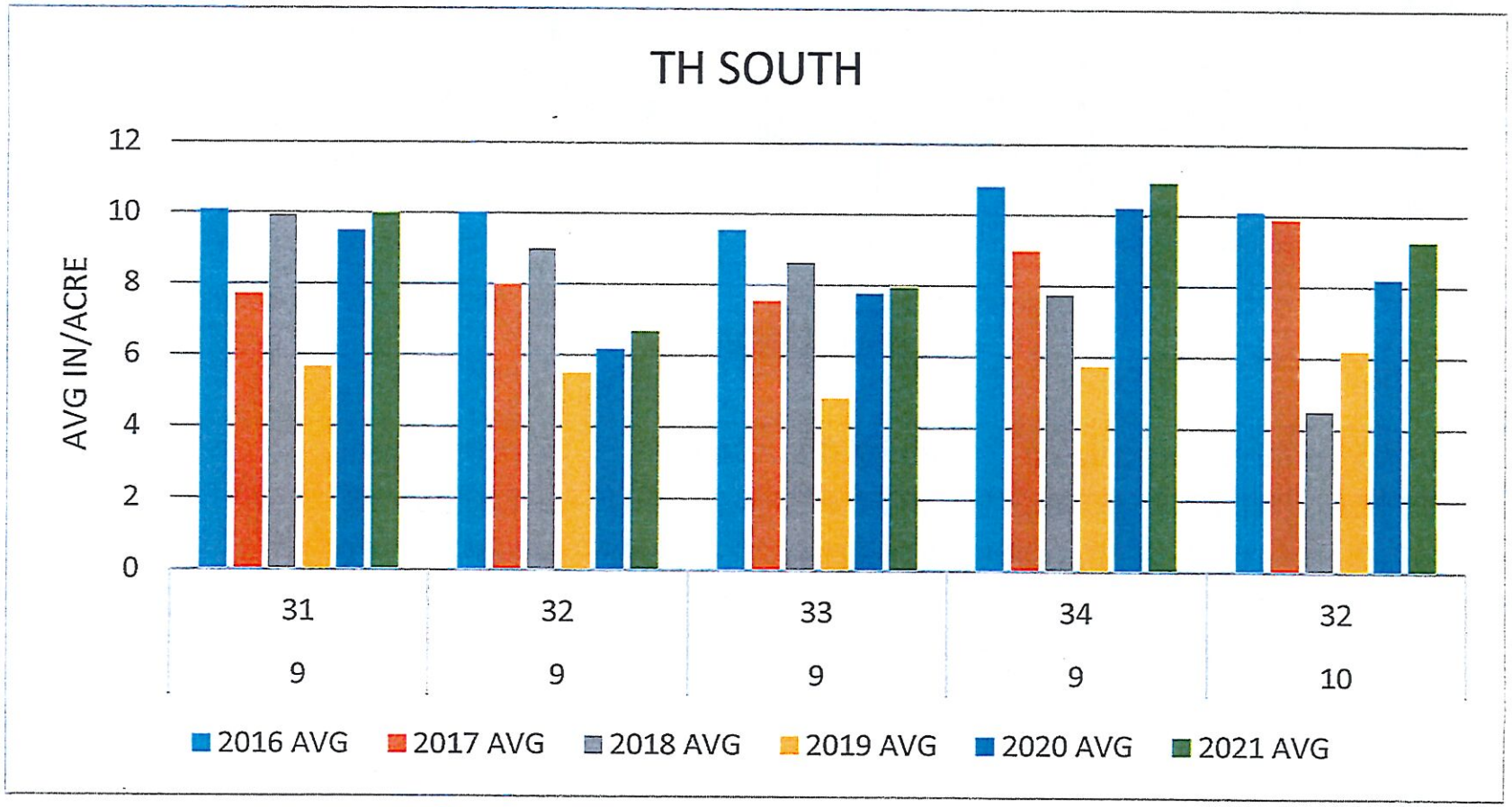
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
10	40	12.24141	7.250286	3.618764	8.213729	13.98242	11.5287
10	41	12.11589	7.512422	8.728254	8.387515	15.54887	11.38407
10	42	10.53629	9.032258	8.267868	9.301946	14.64695	11.48089
11	42	8.500625	6.616568	12.72072	8.788653	11.60618	12.43158



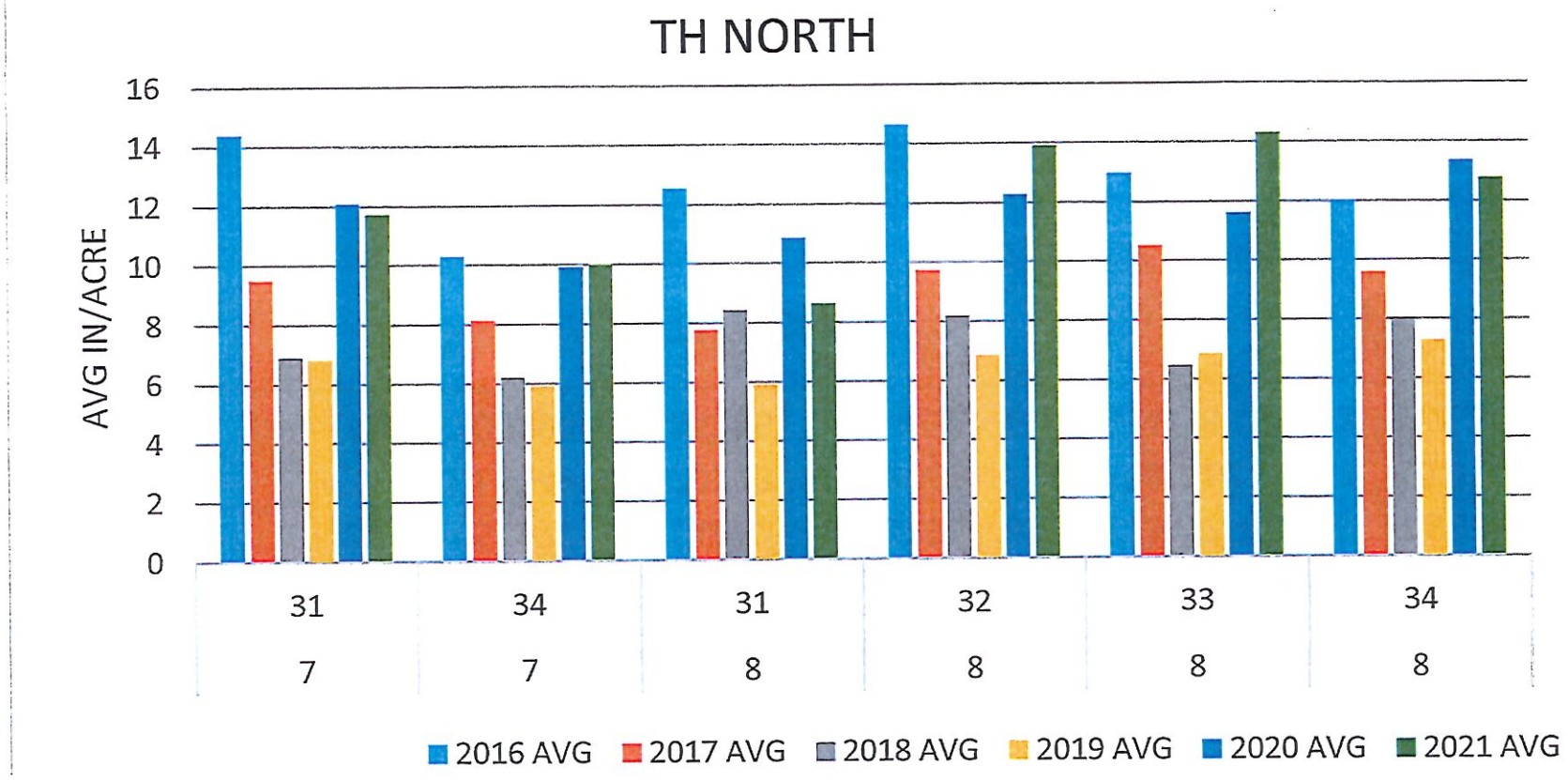
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
8	39	11.40757	8.434814	8.836041	7.657962	11.10042	13.16661
8	42	10.22907	8.57066	7.86919	7.883877	13.13153	11.07063
9	39	10.87464	7.656093	8.965703	8.860582	12.11717	11.97623
9	40	11.09555	8.135154	8.252094	7.212293	12.07304	11.09826
9	41	11.47163	7.545153	7.929122	6.34782	10.62326	10.45875
9	42	9.298034	7.575703	8.392119	7.045143	11.75324	10.37032



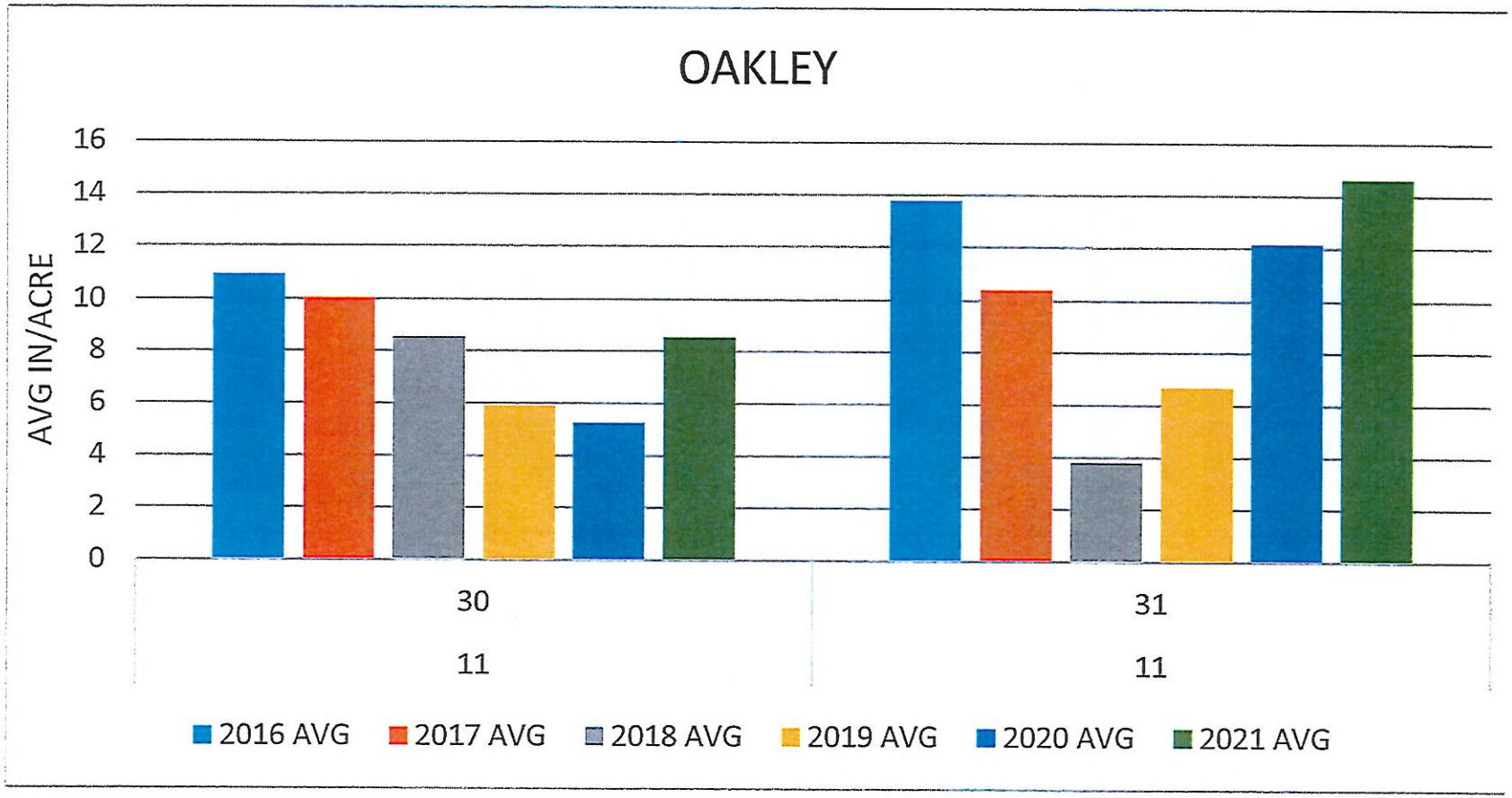
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
9	31	10.08062	7.679288	9.93264	5.655966	9.500258	9.972079
9	32	10.01054	7.956313	8.990673	5.497137	6.170531	6.675926
9	33	9.54377	7.511062	8.62275	4.816873	7.752569	7.933854
9	34	10.8043	8.970203	7.748066	5.7278	10.19953	10.91459
10	32	10.09894	9.884785	4.52	6.180534	8.195731	9.255069



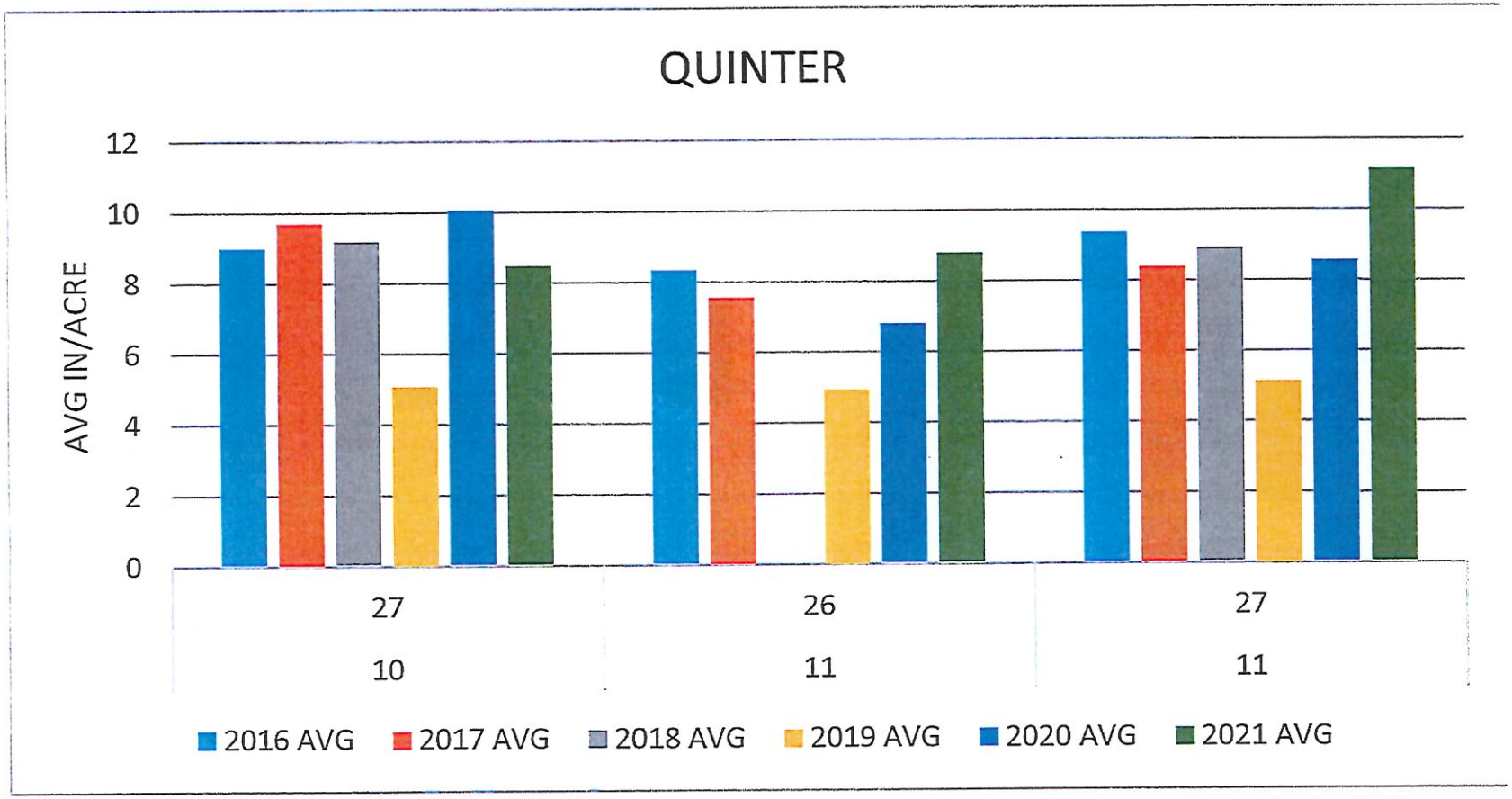
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
7	31	14.38163	9.493693	6.901554	6.809977	12.09445	11.7311
7	34	10.29226	8.144875	6.203055	5.893563	9.905997	9.964861
8	31	12.53537	7.784283	8.437041	5.8814	10.86924	8.66018
8	32	14.62423	9.713368	8.183974	6.830727	12.2738	13.90568
8	33	12.97156	10.48354	6.479285	6.843121	11.61907	14.30411
8	34	12.01924	9.578678	8.033594	7.27751	13.35321	12.77547



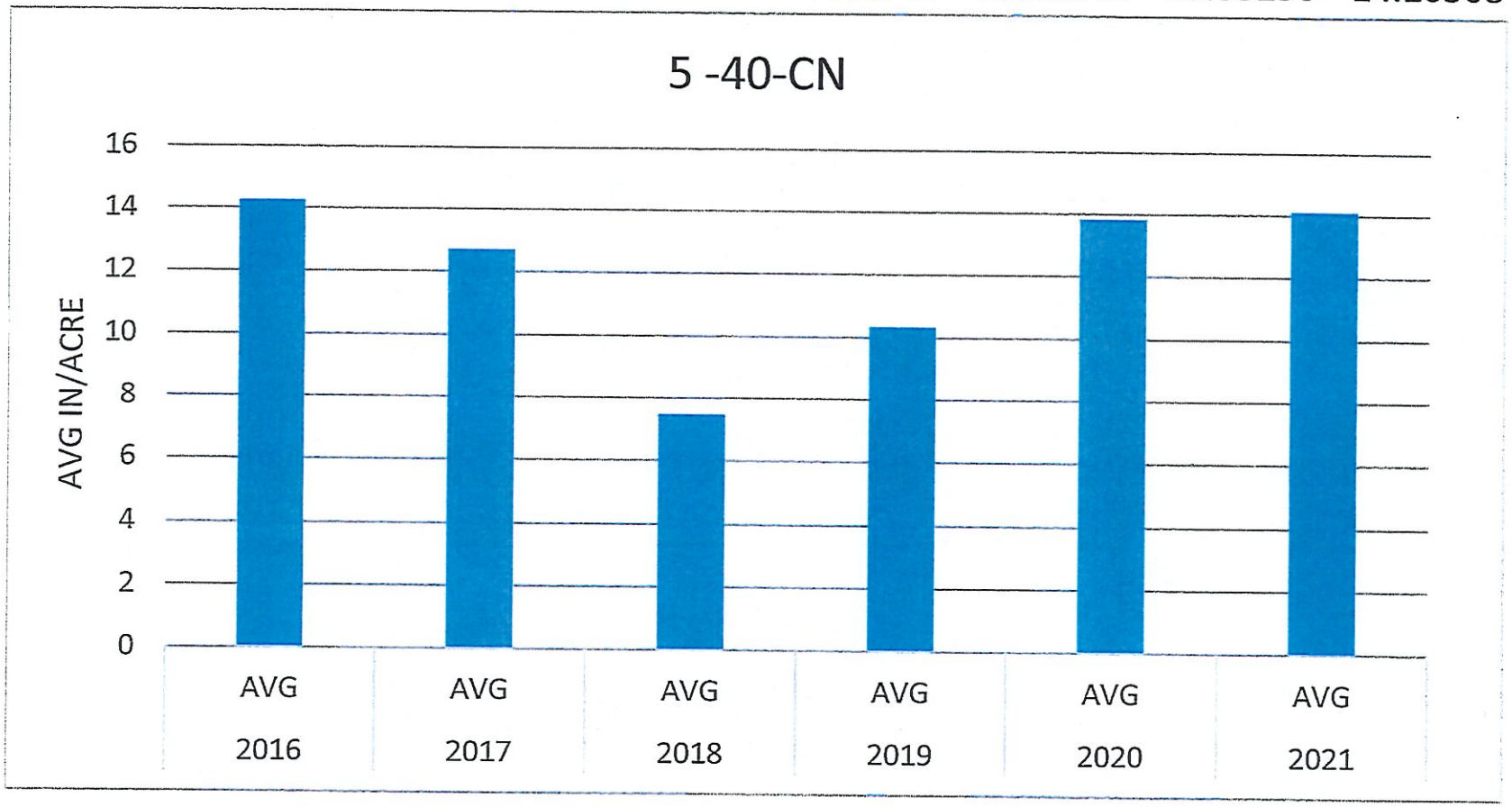
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
11	30	10.9339	10.02571	8.534997	5.873868	5.249803	8.522449
11	31	13.77391	10.40472	3.808649	6.642263	12.12924	14.63604



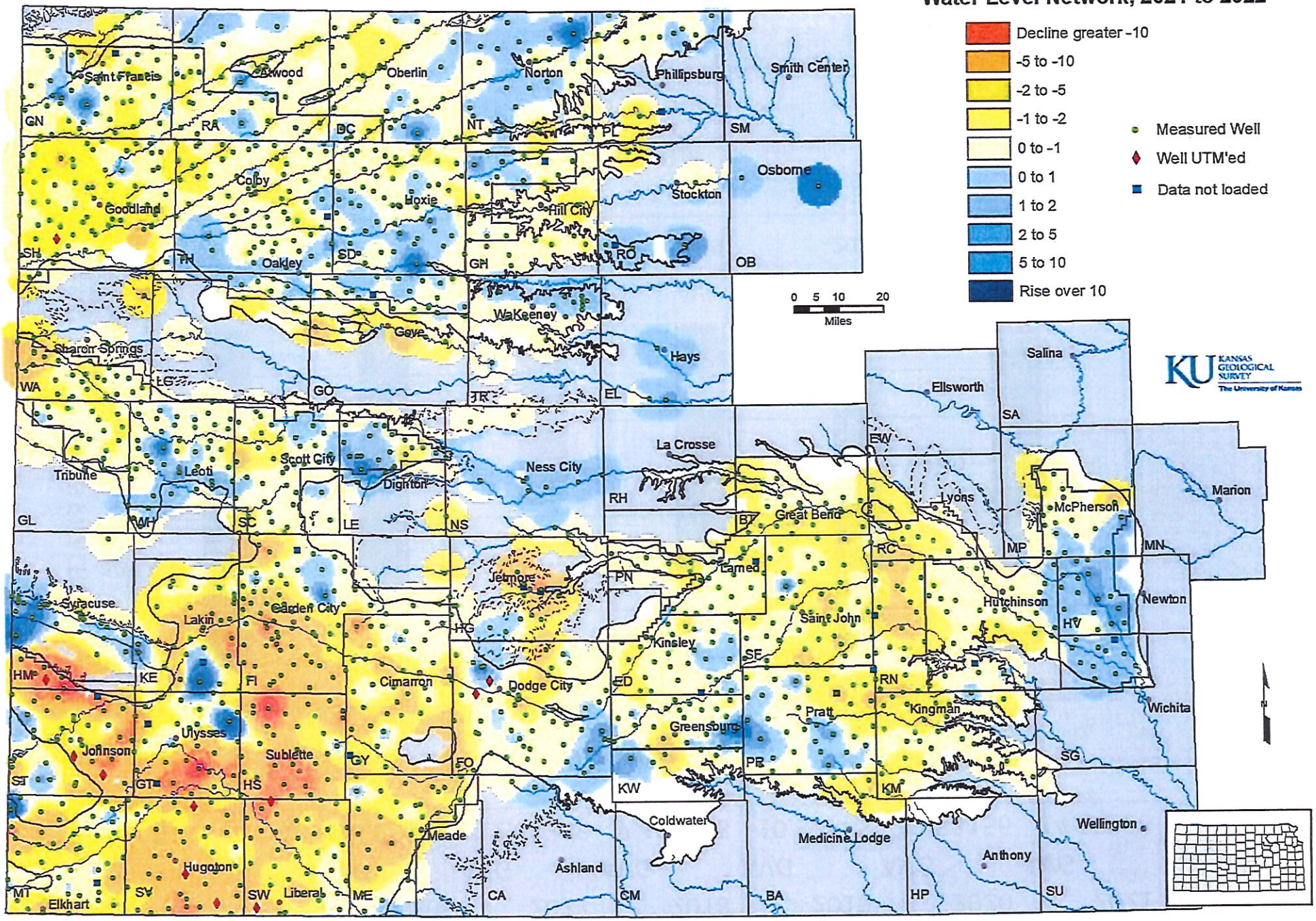
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
10	27	9.005357	9.711508	9.193036	5.075549	10.06728	8.495756
11	26	8.351033	7.56415		4.922273	6.802333	8.808836
11	27	9.370632	8.403232	8.937465	5.121558	8.57093	11.12838



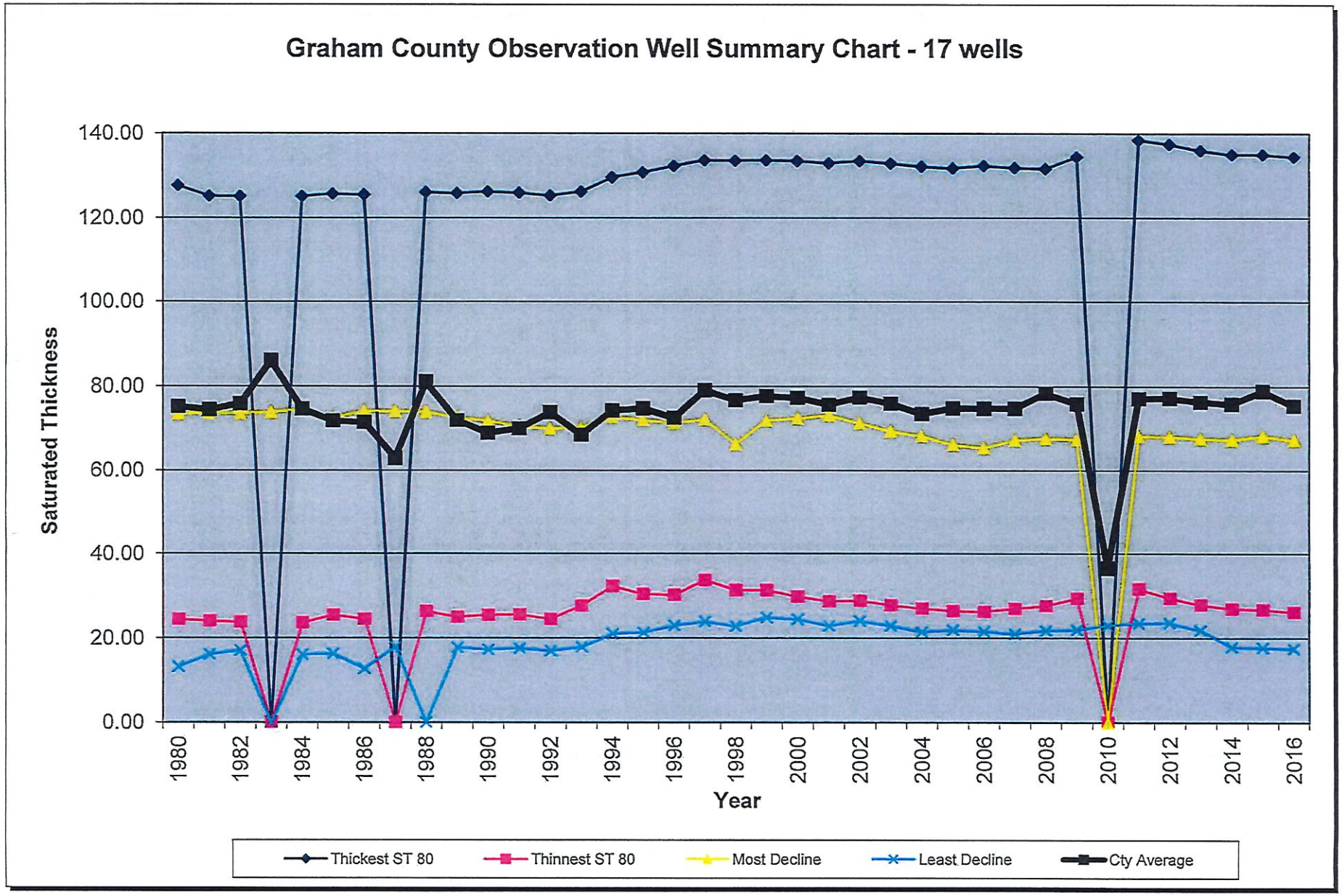
		2016	2017	2018	2019	2020	2021
		AVG	AVG	AVG	AVG	AVG	AVG
5	40	14.25819	12.71348	7.463545	10.32945	13.83156	14.10508

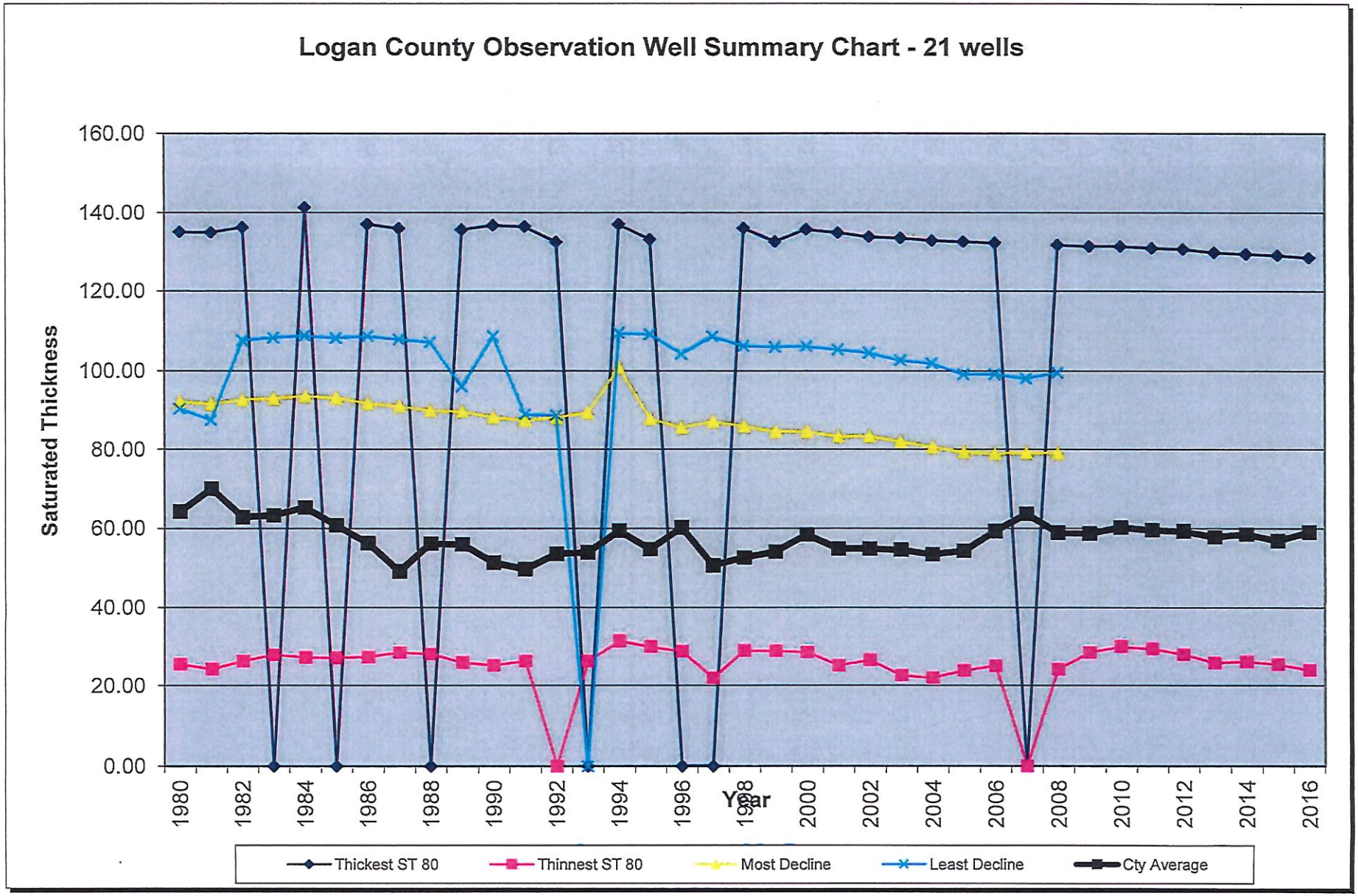


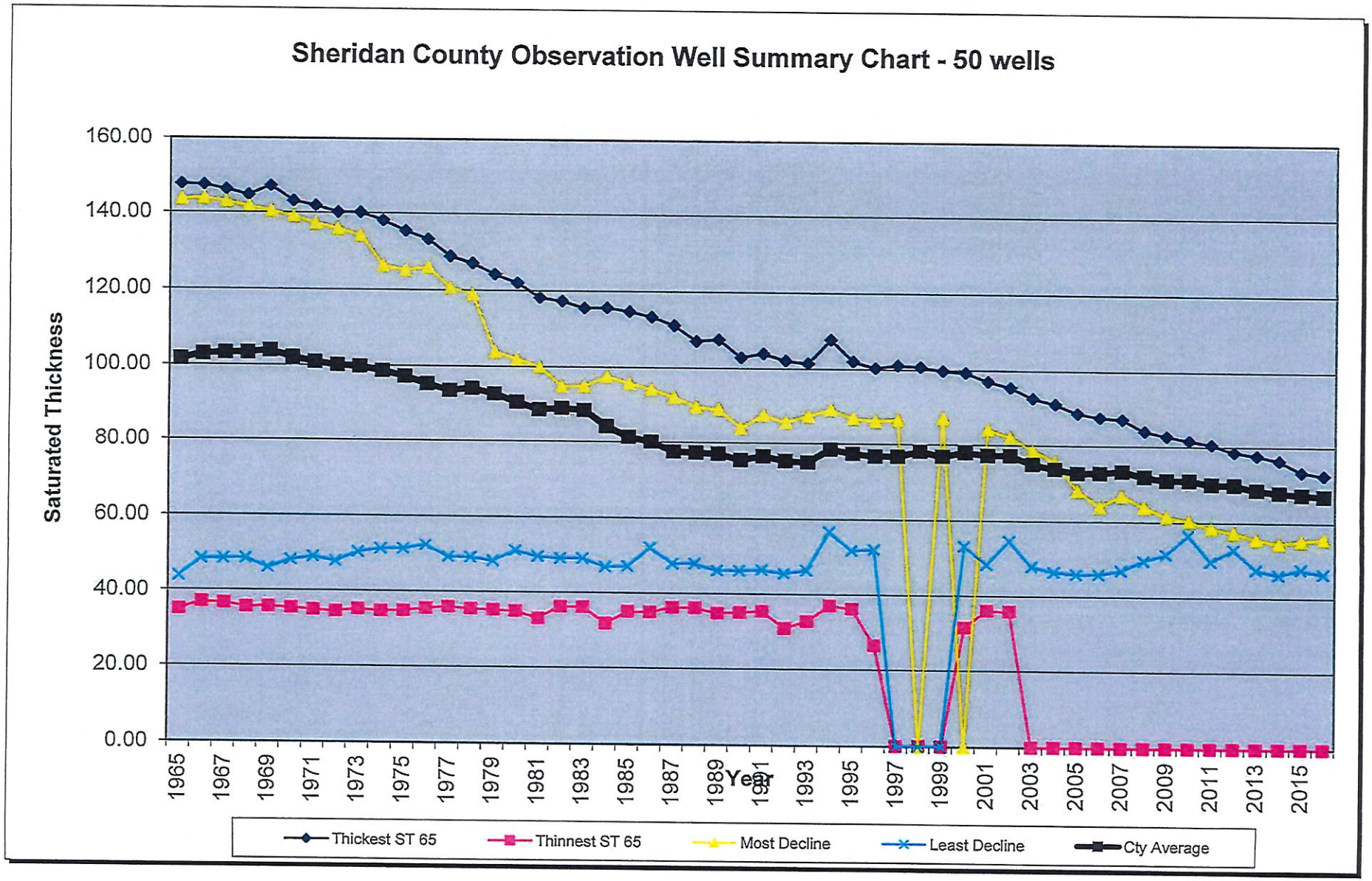
Interpolated Change in Feet, Cooperative Water Level Network, 2021 to 2022*

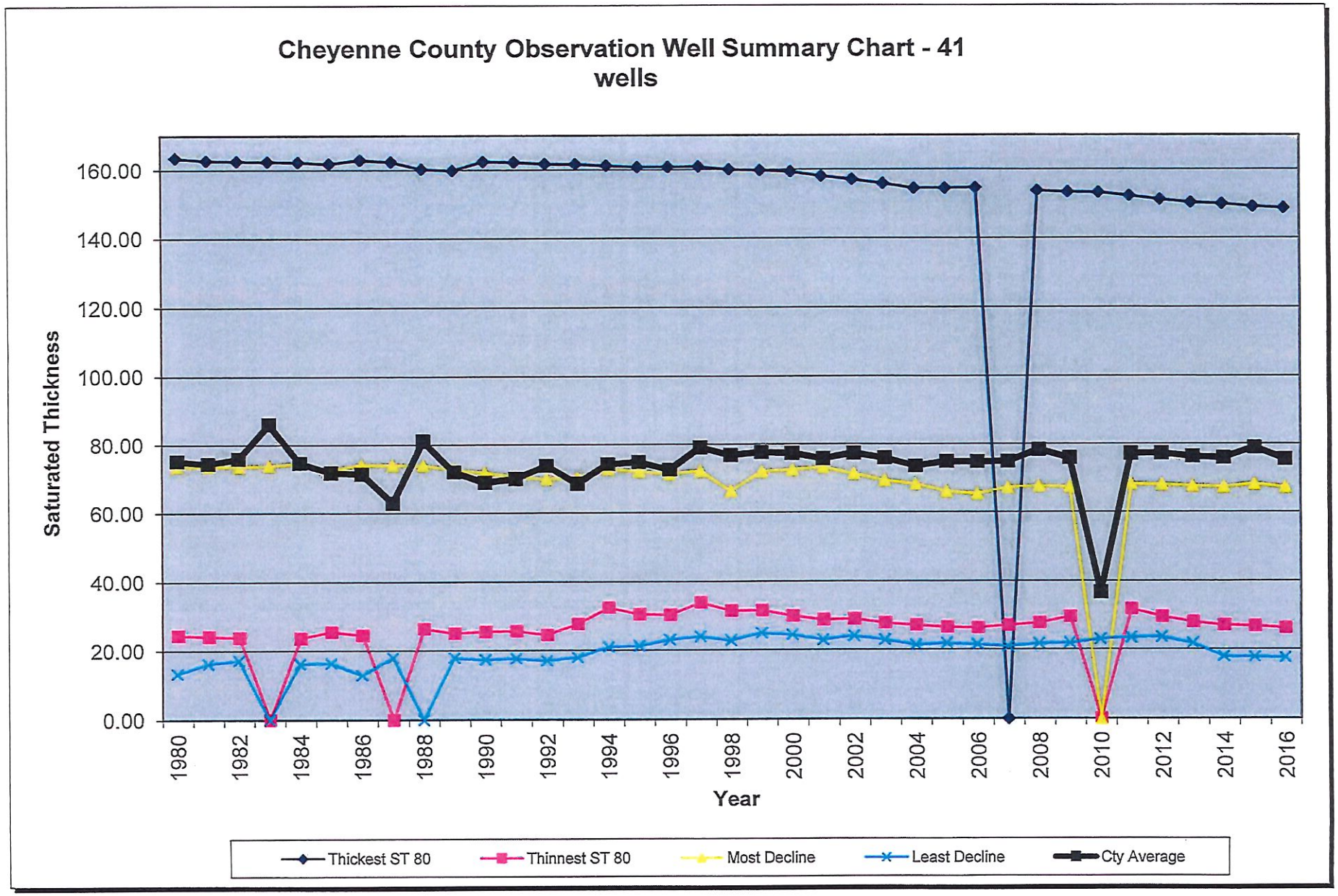


*Results are based only on the cooperative network (KGS and KDA-DWR) and do not include sub-regional networks from the KGS, KDA-DWR or local GMDs.


Graham County Observation Well Summary Chart - 17 wells
Saturated Thickness
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year
Thickest ST 80
Thinnest ST 80
Most Decline
Least Decline
Cty Average


Logan County Observation Well Summary Chart - 21 wells
Saturated Thickness
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year
Thickest ST 80
Thinnest ST 80
Most Decline
Least Decline
Cty Average


Sheridan County Observation Well Summary Chart - 50 wells
Saturated Thickness
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Year
Thickest ST 65
Thinnest ST 65
Most Decline
Least Decline
Cty Average


Cheyenne County Observation Well Summary Chart - 41 wells
Saturated Thickness
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Year
Thickest ST 80
Thinnest ST 80
Most Decline
Least Decline
Cty Average

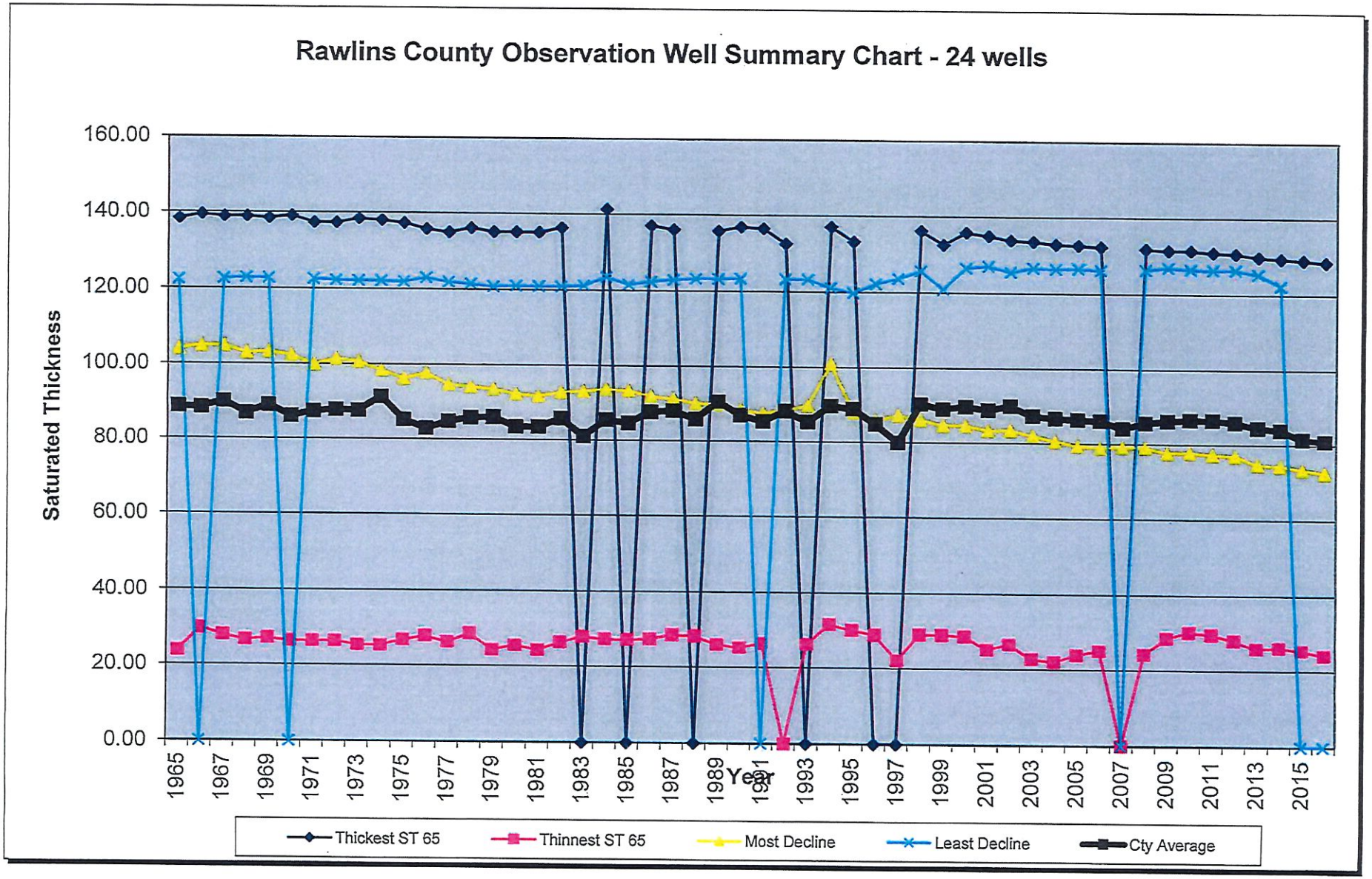

Rawlins County Observation Well Summary Chart - 24 wells
Saturated Thickness
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Year
Thickest ST 65
Thinnest ST 65
Most Decline
Least Decline
Cty Average

Exhibit 5

Request for Renewal of the Greater GMD 4 LEMA Submitted to the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources

February 16, 2022

Request for Renewal of the Greater GMD 4 LEMA Submitted to the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources

Table of Contents

Request for Renewal of the Greater GMD 4 LEMA Submitted to the Chief Engineer, Kansas Department of Agriculture, Division of Water Resources

Preamble and Boundaries

In order to reduce decline rates and extend the life of the aquifer in the Northwest Kansas Groundwater Management District No. 4 (GMD 4), the Board of Directors of GMD 4 proposes the following five-year plan be submitted via the Local Enhanced Management Area (LEMA) process contained in KSA 82a-1041 for the following townships in so far as those townships are located within the GMD 4 boundaries:

Cheyenne County

Township 3 South, Range 37 West
Township 4 South, Range 37 West
Township 4 South, Range 38 West
Township 4 South, Range 40 West
Township 5 South, Range 37 West
Township 5 South, Range 39 West
Township 5 South, Range 40 West
Township 5 South, Range 41 West
Township 5 South, Range 42 West

Gove County

Township 11 South, Range 26 West
Township 11 South, Range 27 West
Township 11 South, Range 28 West
Township 11 South, Range 29 West
Township 11 South, Range 30 West
Township 11 South, Range 31 West
Township 12 South, Range 26 West
Township 12 South, Range 27 West
Township 12 South, Range 28 West

Logan County

Township 11 South, Range 36 West

Rawlins County

Township 3 South, Range 36 West
Township 4 South, Range 36 West

Sheridan County

Township 6 South, Range 28 West
Township 6 South, Range 29 West
Township 6 South, Range 30 West
Township 7 South, Range 27 West
Township 7 South, Range 28 West
Township 7 South, Range 29 West
Township 7 South, Range 30 West
Township 8 South, Range 28 West
Township 8 South, Range 29 West
Township 8 South, Range 30 West
Township 9 South, Range 26 West
Township 9 South, Range 27 West
Township 9 South, Range 28 West
Township 9 South, Range 29 West
Township 9 South, Range 30 West
Township 10 South, Range 26 West
Township 10 South, Range 27 West
Township 10 South, Range 28 West
Township 10 South, Range 29 West
Township 10 South, Range 30 West

Sherman County

Township 6 South, Range 37 West
Township 6 South, Range 40 West
Township 6 South, Range 41 West
Township 6 South, Range 42 West
Township 7 South, Range 37 West
Township 7 South, Range 38 West
Township 7 South, Range 39 West
Township 7 South, Range 40 West
Township 7 South, Range 41 West
Township 7 South, Range 42 West
Township 8 South, Range 37 West
Township 8 South, Range 38 West
Township 8 South, Range 39 West
Township 8 South, Range 40 West
Township 8 South, Range 41 West
Township 8 South, Range 42 West
Township 9 South, Range 37 West
Township 9 South, Range 38 West
Township 9 South, Range 39 West
Township 9 South, Range 40 West
Township 9 South, Range 41 West
Township 9 South, Range 42 West

Sherman County continued

Township 10 South, Range 37 West
Township 10 South, Range 40 West
Township 10 South, Range 41 West
Township 10 South, Range 42 West

Thomas County

Township 6 South, Range 31 West
Township 6 South, Range 33 West
Township 6 South, Range 34 West
Township 6 South, Range 35 West
Township 6 South, Range 36 West
Township 7 South, Range 31 West
Township 7 South, Range 32 West
Township 7 South, Range 33 West
Township 7 South, Range 34 West
Township 7 South, Range 35 West
Township 7 South, Range 36 West
Township 8 South, Range 31 West
Township 8 South, Range 32 West
Township 8 South, Range 33 West
Township 8 South, Range 34 West
Township 8 South, Range 35 West
Township 8 South, Range 36 West
Township 9 South, Range 31 West
Township 9 South, Range 32 West
Township 9 South, Range 33 West
Township 9 South, Range 34 West
Township 9 South, Range 35 West
Township 9 South, Range 36 West
Township 10 South, Range 31 West
Township 10 South, Range 32 West
Township 10 South, Range 33 West
Township 10 South, Range 36 West

Wallace County

Township 11 South, Range 42 West
Township 11 South, Range 43 West

Overview and Goal Expression

To promote improved management of water used, with a goal not to exceed 1.7 million acre-feet (AF) for irrigation over five years within townships displaying an annual decline rate for the period 2004 – 2015 of 0.5% or greater and promote more efficient use by non-irrigation water uses within the proposed boundaries of the Greater GMD 4 LEMA as described above.

This LEMA will exist for the five-year period beginning January 1, 2023 and ending December 31, 2027. This LEMA will include all water right points of diversion located within the township boundaries described above, except for vested water rights and water right with points of diversion whose source of supply is 100% alluvial.

The total program diversion amount of 1.7 million AF for irrigation water right use for townships with annual decline rates of 0.5% or greater will represent five (5) times the sum of designated legally eligible acres times the amount designated for irrigation water rights;

The GMD 4 and DWR will use the procedures described below to determine the five-year allocation for each water right and specify the allocations in Section 3. All allocations will be expressed in terms of total AF for the five-year LEMA period.

Proposed Corrective Control Measures

1. Allocations – Irrigation

    1.1. The allocations provided in Sections 3 and 4 were determined based on the maximum reported and/or verified acres for years 2009-2015. These allocations are subject to change where incorrect water use data is verified via the process in Sections 5 and 6.

    1.2. All irrigation water rights, excluding vested rights and alluvial rights, shall be limited to the allocation for the water right location on the accompanying map, attached as Attachment 1, over the five-year period beginning January 1, 2023, and ending December 31, 2027. If a vested right and an appropriation right have the same place of use or same point of diversion, the vested right will be the vested water right's authorized quantity and the appropriation right will be limited to the total system allocation minus the vested water right's authorized allocation.

    1.3. The base water rights will not be altered by any Order issued under this request, but will be subject to the additional terms and conditions described herein for the duration of this LEMA.

    1.4. Wells pumping to a common system, or systems, shall be provided a single allocation for the total system acres, subject to the review process described in Sections 5 and 6. Where the place of use of a water right or group of water rights receiving a single allocation span two different allocation zones, the total allocation granted shall be based on a weighted average of allocations based on authorized acres in each zone. The total amount pumped by all of the wells involved must remain within the system allocation.

1.5. No water right will receive more than the currently authorized quantity for that right, times five.

1.6. No water right within a K.A.R. 5-5-11 five-year allocation status will receive an allocation that exceeds its current five-year allocation limit.

1.7. No water right will be allowed to pump more than its authorized annual quantity in any single year.

1.8. In all cases the allocation will be assigned to the point of diversion and will apply to all water rights and acres involving that point of diversion. In all cases, the original water right will be retained.

1.9. For water rights enrolled in EQIP and/or AWEP that will be coming out of either program on or before September 30, 2027, the allocation quantity will be set at the annual allocation for only the remaining years of the 2023-2027 LEMA period.

1.10. If a water right is, or has been, suspended, or limited for any year of this LEMA, due to penalty issued by the Kansas Department of Agriculture (KDA), Division of Water Resources (DWR), then the GMD 4 and DWR will reduce the allocated quantity for such water right accordingly for the 2023-2027 LEMA period.

1.11. For water rights enrolled in a KAR 5-5-11 change, MYFA, WCA, or other flexible water plan, the most water restrictive plan will apply.

1.12. The LEMA will not restrict water rights that are still in their perfection period.

1.13. The following uses will be deemed "non-irrigation" for the purposes of this LEMA and will be encouraged to use best management practices in the watering of:

1.13.1. gardens, orchards, and lawns greater than two acres; and
1.13.2. golf courses, cemeteries, athletic fields, parks, racetrack grounds, and similar facilities.

2. Allocations – Non-irrigation

2.1. Livestock and poultry water rights will be encouraged to maintain their use at 90% of the amount provided by K.A.R. 5-3-22 based on the maximum amount supportable by the number of animals authorized by a current facility permit authorized by the Kansas Department of Health and Environment. At no time will a stock water right be authorized to pump more than its authorized quantity.

2.2. Municipal water rights will be encouraged to reduce the amount of unaccounted for water reported annually on the water use report and reduce the gallons per capita per day.

2.3. All other non-irrigation water rights will be encouraged to use best management practices.

2.4. When converting a water right from an irrigation use to a non-irrigation use, the base water right will be converted under the procedures in K.A.R. 5-5-9, 5-5-10, and GMD 4 regulations. The converted water right will then have a LEMA allocation equal to or less than the irrigated LEMA quantity prior to the conversion.

2.5. The base water rights will not be altered by any Order issued under this request but will be subject to the additional terms and conditions described herein for the duration of the LEMA.

3. Individual Allocation Amounts

The five-year allocations for every water right under Section 1 and Section 2 above will be converted to a five-year acre-feet total, with Attachment 1 containing the assigned eligible irrigation restrictions for each township. Each water right will be restricted to its total acre-feet allocation within the LEMA Order issued through this process, subject to the review processes outlined in Sections 5 and 6.

4. Data Set

The relevant data for this LEMA proposal came from the Water Rights Information System (WRIS) maintained by the Kansas Department of Agriculture, Division of Water Resources (DWR).

If any data errors are discovered, then the GMD 4 Board requests that the person or entity discovering the errors contact GMD 4 to update or correct any alleged errors via the processes outlined in Sections 5 and 6.

Attachment 2 contains pdf files of irrigation and stockwater water right numbers and allocations. Associated spreadsheets will be kept by GMD 4 and DWR; will be available on the GMD 4 and DWR websites; and may be changed with the Chief Engineer's approval or through the processes outline in Sections 5 and 6. The GMD 4 and the DWR will document or track any changes made to the irrigation water and stock water right allocations attached hereto.

5. Eligible Acres Process

This Greater GMD 4 LEMA will use the same eligible acres as the 2018-2022 GMD 4 LEMA, except as modified by GMD 4 or DWR during the 2018-2022 LEMA period. The following procedure will be used to assign eligible acres to every irrigation water right in the Greater GMD 4 LEMA and to include in any future LEMA request.

The GMD 4 and DWR determined eligible acres as follows:

5.1. The GMD 4 and DWR used the maximum reported authorized irrigated acres from 2009-2015 that could be verified as being legally irrigated with the GMD 4 in-house aerial photography and water right file information.

5.2. If the authorized place of use was not irrigated from January 1, 2009, to December 31, 2015, then earlier years that the water user irrigated the acres may be considered.

5.3. The DWR will contact every water right owner within 60 days after the Order of Designation and others known to them as operators or interest holders in the water right to inform them of the eligible acres assigned to their water right(s) under the adopted process, allow them the opportunity to appeal the assigned acres under the process described below and allow them the opportunity to provide more information to the GMD 4 Board on the correct acres. The GMD 4 Board's decision is final, and the eligible acres determined by the GMD 4 Board will be used to calculate and assign the final allocations.

6. Appeals Process

6.1. Appeal Process. The following process will govern appeals regarding eligible acres and allocated water:

6.1.1. Any appeal of the eligible acres and allocated water must be filed before March 1, 2024. Failure to file an appeal of the eligible acres and allocated water by March 1, 2024 will cause the assigned eligible acres and allocated water to become final during the LEMA period. GMD 4 and DWR shall coordinate to ensure that no later than 60 days after the order of designation, the basis of the allocations provided in Attachment 2 shall be publicly available through the DWR and GMD 4 websites.

6.1.2. Only eligible acres and allocated water may be appealed through this appeal process. Although allocations are based on 2009-2015 verified acres, more recent irrigated acreages may be considered within the appeal. No other issues including, but not limited to, the LEMA boundaries, violations, meter issues, etc., may be appealed through this process.

6.1.3. GMD 4 Staff will first hear any appeal. GMD 4 Staff will determine eligible acres based on the factors above in Section 5, entitled "Eligible Acres Process."

6.1.4. Any determination made by the GMD 4 staff may be appealed to the GMD 4 Board.

6.1.5. The GMD 4 and DWR will use the acres and allocated water determined through the processes contained in Sections 5 and 6, as detailed above, to calculate and assign allocations, except that more recent irrigated acreages may be used.

6.2. Factors to be considered by the GMD 4 Board on appeal. The following factors, in order of importance, will be used when reviewing a determination of eligible acres and allocated water on appeal.

6.2.1. First, the reviewer will consider the location of the well(s) and their township allocations.

6.2.2. Second, the reviewer may consider the authorized place of use.

6.2.3. Third, the reviewer may consider any and all aspects of the water right, use, place of use, point of diversion, or any other factors the reviewer determines appropriate to determine eligible acres and allocated water.

6.3. If a water right holder, or water user, demonstrates that they have lawfully expanded a water right's place of use from 2009-2022, the appropriate allocation for such additional lands may be provided.

7. Violations

7.1. 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 GMD 4 on its effective date.

7.2. Upon GMD 4 learning of an alleged violation, GMD 4 will provide DWR with the information GMD 4 believes shows the alleged violation. DWR, under its discretion, may investigate and impose restrictions and fines as described below or allowed by law.

7.3. DWR will address violations of the authorized quantities as follows:

7.3.1. Exceeding any total allocation quantity of less than 4 AF within the allocation period will result in a $1,000.00 fine for every day the allocation was exceeded.

7.3.2. 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.

7.4. In addition to other authorized enforcement procedures, if the GMD 4 Board finds by a preponderance of evidence that 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 GMD 4 Board will make a recommendation to the Chief Engineer that a written order be issued which states:

7.4.1. The nature of the violation;
7.4.2. The factual basis for the violation;
7.4.3. That the water right is suspended for 5 years; and
7.4.4. That the water right loses all remaining assigned quantities under the District-Wide Local Enhanced Management Area.

8. Metering

8.1. All water right owners will be responsible for ensuring their meters are in compliance with state and local law(s). In addition to complying and reporting annually the quantity of water diverted from each point of diversion, all water right owners shall implement at least one of the following additional well/meter monitoring procedures:

8.1.1. Inspect, read, and record the flow meter at least every two weeks the well is operating. The well owner will maintain records of this inspection procedure and provided to GMD 4 on GMD 4's request. If the flow meter reported readings be in question, the bi-weekly records not be available,

and the bi-weekly records no be provided upon request of the GMD 4, then the well shall be assumed to have pumped its full annual authorized quantity for the year in question. Following each year's irrigation season, the person, or persons, responsible for this data may at their discretion transfer the recorded data to the district for inclusion in the appropriate water right file for future maintenance.

8.1.2. 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 and operators are encouraged to give the details of the alternative method in advance to GMD 4 in order to insure that the data is sufficient.

8.2. Any water right owner or authorized designee who finds a flow meter that is inoperable or inaccurate shall, within 48 hours of finding a flow meter that is inoperable or inaccurate, contact the GMD 4 office concerning the matter and provide the following information:

8.2.1. water right file number;
8.2.2. legal description of the well;
8.2.3. date the problem was discovered;
8.2.4. flow meter model, make, registering units, and serial number;
8.2.5. the meter reading on the date discovered;
8.2.6. description of the problem;
8.2.7. 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;
8.2.8. the projected date that the meter will be repaired or replaced; and
8.2.9. any other information requested by the GMD 4 staff or Board regarding the inoperable or inaccurate flow meter.

8.3. Within seven days after 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 GMD 4.

8.4. 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.

9. Accounting

9.1. DWR, in cooperation with GMD 4, shall keep records of the annual diversion amounts for each Water Right within the LEMA area, and the total five-year quantity balances will make this information available to the Water Right Holder and the GMD 4 on their request.

10. Advisory Committee

10.1. The GMD 4 Board will appoint and maintain a Greater GMD 4 LEMA Advisory Committee consisting of 14 members as follows: one GMD 4 staff; one GMD 4 Board Member; one representative of the Division of Water Resources, Kansas Department of Agriculture as designated by the Chief Engineer; and the balance of the members will be irrigators with regional distribution identical to GMD 4 board member distribution. One of the Greater GMD 4 LEMA Advisory Committee members shall chair the committee. The Advisory Committee will meet annually to consider:

10.1.1. water use data;
10.1.2. water table information;
10.1.3. economic data as is available;
10.1.4. violations issues – specifically metered data;
10.1.5. any new and preferable enhanced management authorities become available;
10.1.6. other items deemed pertinent to the advisory committee.

10.2. The Advisory Committee, in conjunction with DWR, shall produce an annual report that shall provide a status for considerations 10.1.1 through 10.1.6 and any recommended modifications to the current LEMA Order relative to these six items. The report will be delivered to the GMD 4 board and the Chief Engineer.

10.3. The Advisory Committee shall review what additional water level data is available, its quality and suitability for use in improving the water level data network used for future water management decisions should the GMD 4 wish to continue with LEMA management based on water level decline rates.

11. LEMA Order Reviews

11.1. In addition to the annual LEMA Order reviews under Section 10, the Advisory Committee will also conduct a formal LEMA Order review 18 months before the ending date of the LEMA Order. Review items will focus on economic impacts to the LEMA area and the local public interest. Water level data may be reviewed.

11.2. The Advisory Committee, in conjunction with DWR and GMD 4, will also produce a report following this review for the Chief Engineer and the GMD 4 Board. The report will contain specific recommendations regarding future LEMA actions. All recommendations shall be supported by reports, data, testimonials, affidavits, or other information of record.

12. Impairment Complaints

While this LEMA is in effect, the GMD 4 stakeholders request that any impairment complaint filed in GMD 4 that is based upon either water supply issues or a regional decline impairment cause, be received by the Chief Engineer and investigated by the Chief Engineer with consideration to the on-going LEMA activities.

13. Water Level Monitoring

The data used to determine regional aquifer declines in Attachment 1 are based on the annual water level monitoring taken by KGS and DWR. These measurements will continue as the data set used in determining water level declines. In the future, GMD 4 may, but is under no obligation to, install additional monitoring wells.

14. Coordination

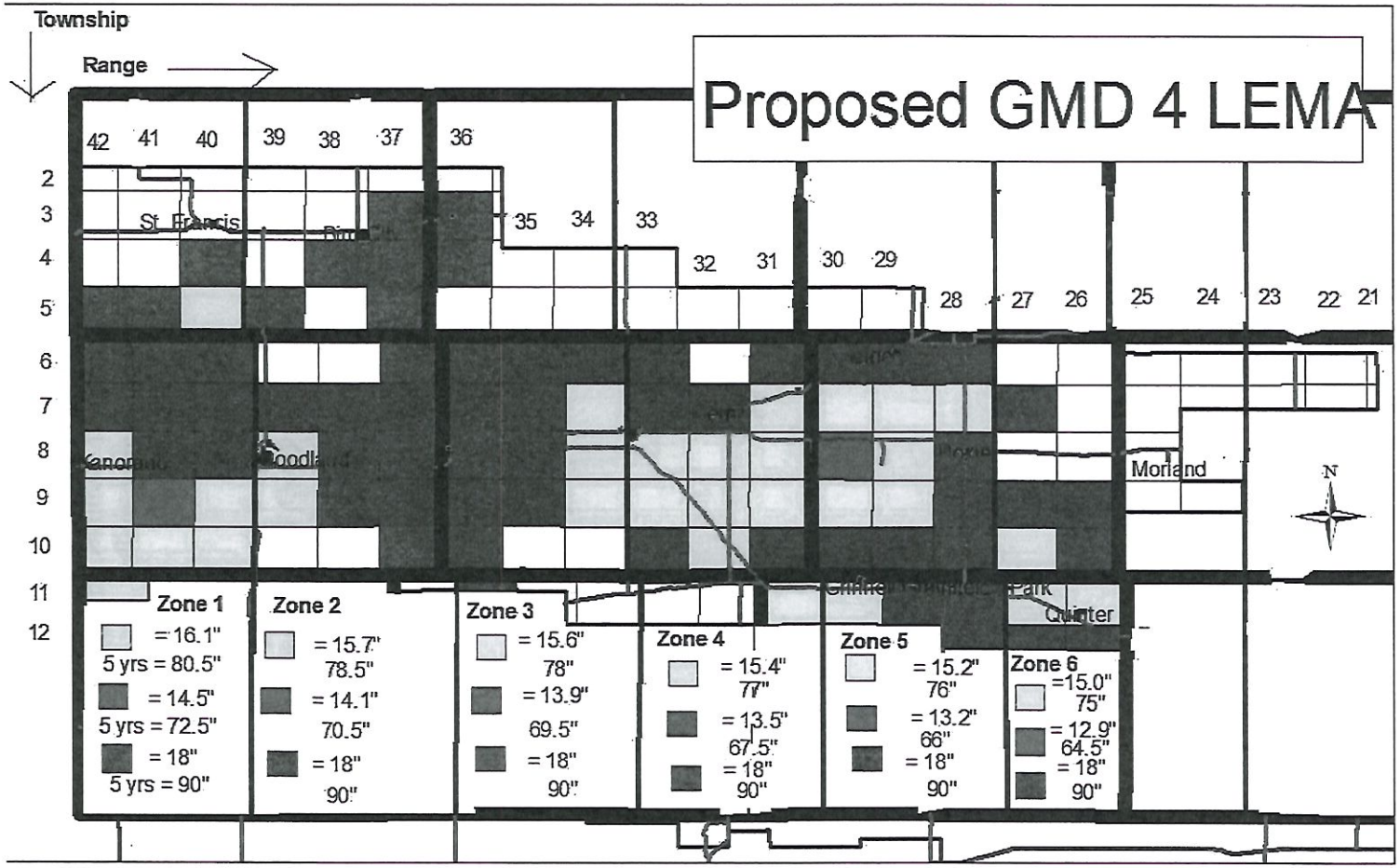
The GMD 4 stakeholders and the GMD 4 Board expect reasonable coordination between the Chief Engineer, KDA, DWR, and the GMD 4 on at least the following efforts:

14.1. Development of the LEMA Order resulting from the LEMA process;

14.2. Accounting for annual pumpage amounts by LEMA water right owners and operators; and

14.3. Compliance and enforcement of the Greater GMD 4 LEMA Order.

Attachment 1



Prepared by Shannon Kenyon GMD 4

Attachment 2

Irrigation Allocation Website

https://connect.kda.ks.gov/apps/DWRLema/Gmd4/Irrigation

GMD 4 LEMA
Irrigation Water Right

GMD 4 LEMA Stock
Water Rights.pdf

Attachment 3

Public Meeting Notes and Sign-in Sheets

Previous Received Comments

Everyone in the LEMA should have probes.

Should only be able to irrigate one crop/year

Saint Francis Public Meeting Comments 8/19/2021

Topic 1: More or Less Reductions?

What we're doing here now, does it make a difference?

So water levels are coming up?

The townships in Southern Sherman that are yellow and red should be reduced more.

What about our future, for our kids and grandkids?

How do we compare to the other Districts?

What about the feedlots, dairies, pork & beef and packing industries moving in, taking our water? What happens to them?

Topic 2: Carry Over

I think carry over is a good idea for the next five year period.

There's really no benefit to carry over.

So if you carry over, wouldn't that cause over pumping?

With a mix of wet & dry years, there's really no need for carry over.

If you could actually carry it over, that would be beneficial.

It's not really a carry over, it's more like a punishment if you don't conserve.

Topic 3: Irrigation Conversion

Any discussion on municipalities? Many are wasting it.

Feedlots need to have a stake in the game.

It's everybody's water, so it's everybody's responsibility.

Topic 4: Other Ideas

Are there any end guns on pivots in Kansas anymore? Because they are all over in Colorado and Nebraska.

Not happy with the Republican River Compact.

We might need to change the crops we grow.

Saint Francis Written Comments — Received 8/19/2021

Topic #1
Should there be more or less reduction?

5 more years of this plan and then next step to make sure we are conserving

Remain the same and study.

I think it should stay the same and see what another 5 years shows.

Topic #2
Should there be carryover?

I think if you save 5" over 5 years you should be able to use ½ of what you saved in a dry year.

Not at this time.

No carryover!

Topic #3
Should there be irrigation conversion to other beneficial uses?

Yes – all should comply.

Topic #4
Other ideas or problems with the current LEMA? Or a message to the board of Directors.

I think all irrigation should be under restriction everywhere.

Protect our future generation

2023-2027 LEMA PUBLIC MEETING

Northwest Kansas Groundwater Management District No. 4

August 19, 2021

Saint Francis, Kansas

NAME	CITY
Tom Stevens	St. FRANCIS
Dennis Wright	Bird City
Don Wright	Bird City
[illegible]	
Rodney Bracelin	St. Francis
Roger Zweygardt	St. Francis
[illegible]	St. Francis
John Lampe	St. Francis
Dan Stephens	St. Francis
David Stephens	St. Francis
Tom Smull	SF
Matt Smull	ST. Francis.
Chris Bracelin	St Francis
Curt [illegible]	St Francis
Spencer Schlepp	St Francis
Dylan Loyd	St. Francis
Robert Grace	"
Dennis Weeden	St Francis
Mitch Schlepp	SF

(19) +2 Staff

Goodland Public Meeting Comments **8/19/2021**

Topic 1: More or Less Reductions?

We need to note that there are too many straws in the whole.

Are we really slowing down?

What about 9-41, is it slowing down?

What's the most radical feedback you've had?

Topic 2: Carry Over

I think we're on the right track. I would like to see carryover myself.

The carryover is a huge incentive to manage the water. It puts you in the mindset to shut off to save.

Next year you might be able to pump that extra if it's not a wet year.

Maximum carryover is the next zone up from what color your township is in on current LEMA plan.

Should they send out a reminder that you only have "X" amount of water that you have left.

It would be helpful to have the water right allocation on the "What's my allocation" website.

Has there been talk regarding keeping your wet acres the same, or increase them. If you take a tower down, do you lose those acres?

Will it (LEMA) die at the end of the 5 years? It would benefit us for the process to be as hard as possible for you guys to enact it.

If you over pump, can carryover take care of it?

Topic 3: Irrigation Conversion

Can you clarify the problem with the beneficial use – the loophole?
It should be restricted.

I don't think you should mess with the city.

Goodland Written Comments **Received 8/19/2021**

Topic #1
Should there be more or less reduction?

Cut 2 more inches off everyone.

Stay the same

Yes there should be slight more reduction. I would suggest around 10% reduction to the current LEMA inches/acre but still be able to pump water right amount in 1 year.

Topic #2
Should there be carryover?

Sure

5%

No I think the LEMA's should stay 5 years at a time. Water conservation should be about conserving not about getting X amount of water and using it whenever I want in 10 years

Topic #3
Should there be irrigation conversion to other beneficial uses?

NO

Only at the LEMA amount

Yes for new stock water. Wells irrigating now should not be able to pump more water because of different use.

Topic #4
Other ideas or problems with the current LEMA? Or a message to the board of Directors.

2023-2027 LEMA PUBLIC MEETING

Northwest Kansas Groundwater Management District No. 4

August 19, 2021
Goodland, Kansas

NAME	CITY
Nathan Emig	Goodland, KS
Marsha Schilling	Edson, KS.
David Rietcheck	Gld.
Stephen D. Cebula	Goodland
Blaine Sederstrom	Goodland
Mitchell Glassman	Goodland
Thad Hahn	Goodland
Steve Duell	Goodland
Bob Middleton	"
Rod Miller	Goodland
Craig Boggie	Goodland
Ryan Hill	Goodland
Kevin Bottrell	Goodland
Leonard Kalkof	Goodland
John Mosbarger	Goodland
Jace Mosbarger	Goodland
John Windle	Goodland
Kimberly Emig	Goodland
Dan Stephens	St. Francis
Robin Dendas	Goodland
Lee Hines	Colby, KS
Curtis Doman	Edson, KS
Thatcher James	Goodland, KS
Alan Townsend	Goodland KS

(24) + 2 staff

2023-2027 LEMA PUBLIC MEETING

Northwest Kansas Groundwater Management District No. 4

August 19, 2021
Goodland, Kansas

NAME	CITY
Brent Cook	Goodland N
Brady Philbrick	Goodland
Tristan Thomas	Goodland
Ken Klemm	Goodland
Jeff Quenzer	Brewster
Lamed Whitaker	Goodland
[illegible]	Goodland
Todd Quenzer	Brewster
Ross Townsend	Goodland
H.D. Ha[illegible]	Gld
Doug Irvin	Gld

(11)

Colby Public Meeting Comments **8/20/2021**

Topic 1: More or Less Reductions

I'd like to see the areas that have 18 inches decreased to 15 inches.
(Didn't get the counter statement to this statement)

Using your political position to do it.

Topic 2: Carry Over

What about where it says the 10% carry over in the LEMA.

How many wells, how many AF, and where are they?

Topic 3: Irrigation Conversions

What about municipalities? - - They are included in the 1.2%

Cities may be looking for water in the future.

We use the most of the water. Let them have their water.

What positive we have ahead is that these areas aren't growing. It's almost a moot point.

What we don't want in the paper is that we don't have enough, and we need to stop.

Where does priority right come in to play?

Didn't the LEMA take care of that?

What's everyone's thought on a feedlot expansion or packing plant coming in?

I thought it was AF/AF

So he could pipe it in? Discussion with Foote was that he could.

I was on the board when we made that change that made that possible.

What if he drills a new well?

Colby Public Meeting Comments (cont.)

What was that program called that grouped wells together to move water around? (WCA)

Who approves those?

You are headed towards that bridge, and need to be thinking about it.

Topic 4: Other Ideas

Where is GMD4 heading with this? Are we trying to get to a 0 decline? What is our rate of decline?

Set a blanket goal!

Need a benchmark!

What are we actually doing?

What did we do with excess decline?

Calibrate the model to what is actually happening?

Moved index wells - -lose the continuity.

Got to set a goal like ½% per year.

I'm not fond of using SD-6 for an example – they got more rain than we did.

Is it actually doing anything? I haven't changed a thing in my farming practice.

I suggest we leave the AF the same, cut 25% across the board, with a cost of $10/ac in to over pump. The next year use the same program, then get paid $10/ac in for not over pumping. It would be a self-funded program to pay those willing to cut back.

What if it rains and nobody pumps – how are you going to pay everyone?

Use what AF?

Everybody should be cut equally?

Can't cut everything equal.

Well then why are you following this?

Colby Public Meeting Comments (cont.)

I'm being forced to.

I'd gladly reduce 25% if everyone else was too.

That's what they gave us.

- Keep it the same, don't change it.

Colby Written Comments **Received 8/20/2021**

Topic #1
Should there be more or less reduction?

Same

Maybe a little bit more with some flexibility

Leave the same

Could be more reduction

More – 11"/yr or 55" over 5 years

Topic #2
Should there be carryover?

Absolutely!! Don't want to promote USE IT OR LOSE IT. Save what is saved!!!

2 - Yes

More carryover

Yes 5" max like Sheridan 6

Topic #3
Should there be irrigation conversion to other beneficial uses?

Yes and should not increase consumptive use

2 - No

Ok

Topic #4
Other ideas or problems with the current LEMA? Or a message to the board of Directors.

Set a goal for life of Aquifer!!! It would be nice to have water here for my grandkids.

2023-2027 LEMA PUBLIC MEETING

Northwest Kansas Groundwater Management District No. 4

August 20, 2021

Colby, Kansas

NAME	CITY
Marilyn Friesen	Colby
Bill Mullen	Colby
Tony Schlegel	Colby
Karen Stevens	Colby
Jeff Munn	Menlo
Kent Hicard	Colby
Jon McKee	Brewster
Ken Christiansen	Bartlesville
Abby Kroupa	Colby
Max Munn	Quinter
Lyle Hirsch	Colby
Ron Ball	Colby
Steve Fanning	Colby
Mark Myers	Colby
Steve Engelman	Colby

(15)

26 TOTAL

2023-2027 LEMA PUBLIC MEETING

Northwest Kansas Groundwater Management District No. 4

August 20, 2021
Colby, Kansas

NAME	CITY
Eugene Schwarz	Oakley, Ks
Jonathan Higerd	Gem KS
J Frizzell	
BROCK SLOAN	OAKLEY, KS
LYNN GOOSSEN	Colby KS
SHANNON HOPSON	Colby KS
Aaron Higerd	Colby KS
Clay Rush	Levant, Ks
[illegible]	
Ken Gompton	

(10+1*) *Bert Stramel did not sign in jem

Hoxie Public Meeting Comments **8/25/2021**

Check it to know where you're at. . . Having something in place to help manage it.

On the sheet you handed out there were a few years that it fell – leave it the way it is.

Leave it the way it is.

So we're in year 3 or 4?

I think you are spot on with #2 point on the slide. (Carryover – Board of Directors wants to assure that previous conservation will not limit future use.)

There is a reduction on the conversion in Sheridan County.

And that was what KLA screwed us on?

That's all they should get (LEMA quantity).

Are we seeing more WCAs going in?

So I hope you aren't penalizing those that are conserving . . . Not using the full amount.

Carryover like in NE.

What would happen if the board decides to NOT renew the LEMA? More use, would lead to the State stepping in?

What's everyone seeing this year?

We are holding in good. Usually pump it – have air.

Pumping a lot of air. If it takes 3 days to go round, we turn it off for 3 days. If it takes 7 days, then we shut off for 7 days.

How much you putting on?

1 ¼

I would like to see some carryover for emergency uses.

NO WRITTEN COMMENTS RECEIVED

2023-2027 LEMA PUBLIC MEETING

Northwest Kansas Groundwater Management District No. 4

August 25, 2021
Hoxie, Kansas

NAME	CITY
Mitchell Barfknecht	Hoxie
Brett Mergenthaler	Quinter, KS
Joe Woldman	York
DAVE NIERMEIER	HOXIE
Dwayne Kersenbrock	Hoxie
Stan Albers	Hoxie
Shane Mann	Quinter
Scott Mangroth	Oakley
Dan Watkins	Hoxie
Mike Mense	Hoxie
Don Boys	Selden
[illegible]	Hoxie
[illegible] Neff	Selden
[illegible]	Hoxie
Ron Neff	Selden
Brian Luedke	Colby

(16) + 2 Staff

Other Comments **Received After 8/25/2021**

Topic #1
Should there be more or less reduction?

I would like to see the LEMA remain the same as it is currently. I think we need to have a few more years of water use date, at this level, to see if it is getting the results that we are trying to obtain.

Leave it alone for now.

Topic #2
Should there be carryover?

I think that allowing a carryover amount of water will result in less water used over time. I think that an irrigator who has conserved a carryover amount of water would be more likely to only use it if needed. I think that an irrigator would be more likely to pump the remaining water the last year or two of the LEMA if no carryover was allowed.

Yes! *Should be able to transfer acre feet between wells as they do in Sheridan County #6.* Why are the rules different.

Topic #3
Should there be irrigation conversion to other beneficial uses?

I don't have enough information on this to form an opinion.

On a limited and well-studied bases that doesn't harm family family farms.
FEED LOTS should be last in consideration & packing houses (these are corporations).

Topic #4
Other ideas or problems with the current LEMA? Or a message to the board of Directors.

I have no problem with the current LEMA. Being able to use the FLEX program has helped tremendously.

See #2

Other Comments Received After 8/31/2021

Topic #1
Should there be more or less reduction?

No response.

Stay the same for another five years.

Topic #2
Should there be carryover?

Yes, we have already conserved the water, but should have the ability to use some of our saved buildup during dry years. Otherwise, this comes off as less of a voluntary formed LEMA reduction and more like use it or lose it.

Yes, but not transferable from one water right to another unless it has already been instituted or combined.

Topic #3
Should there be irrigation conversion to other beneficial uses?

No

Stay with current crops.

Topic #4
Other ideas or problems with the current LEMA? Or a message to the board of Directors.

No response.

Towns and cities need to be allocated too.

Other Comments via Email and Text:

A goal is important to effectiveness

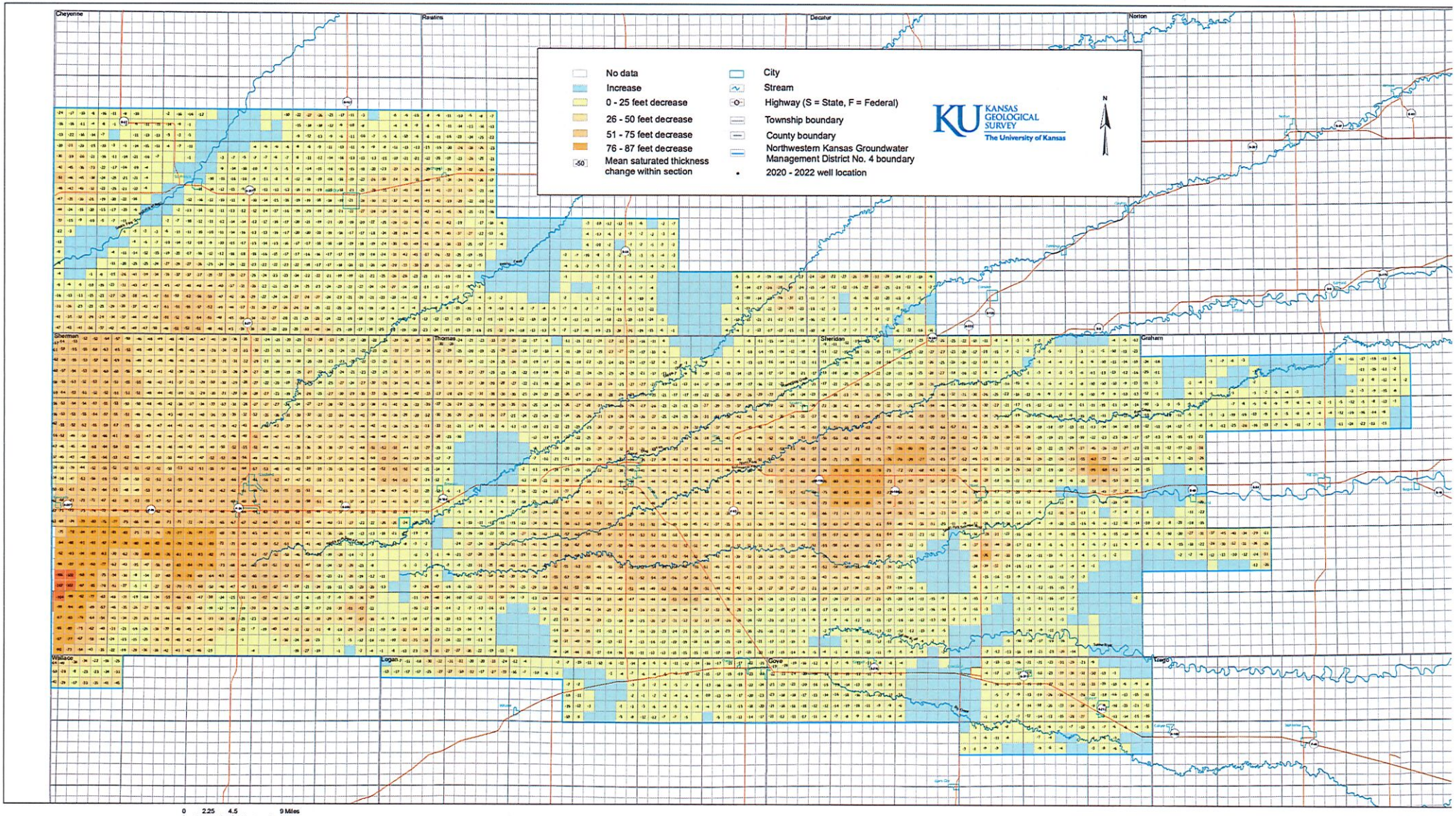
"I think there are people that only see us as a large irrigation user because of the amount of acres we farm, but we are probably about as proconservation as anybody. We have everything from 150 gpm to 900 gpm wells, and have learned how to adapt to both. If we were to increase reduction it needs to be in a way that gets everyone involved in conservation since the biggest problem with the current LEMA doesn't even restrict a lot of water rights that can't pump the allocation anyway."

"I don't know what the best scenario is going forward. I think the current LEMA has been excellent at getting people in a conservation mindset, but if we want to extend the longevity of the aquifer we need a plan to get everyone involved in water savings from the 150 gpm well to the 900 gpm well that doesn't just put everyone at the same level as the 150 gpm well. "

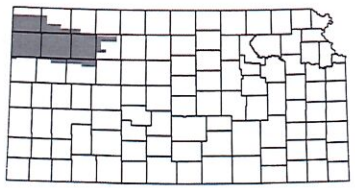
"Would there be any logistical way to base allotment off of bushels per inch? Keep current LEMA amounts and put another layer on it for efficiency."

Estimated Change in Saturated Thickness, Predevelopment to Average 2020-2022, of the High Plains Aquifer in Northwestern Kansas GMD No. 4 (KGS Open-File Report 2022-x)

Exhibit 6



Projection Lambert Conformal Conic
Standard Parallels: 33 0 0 and 45 0 0 degrees North
Central Meridian: -98 15 0 degrees West
Latitude of Origin: 36 0 0 degrees North



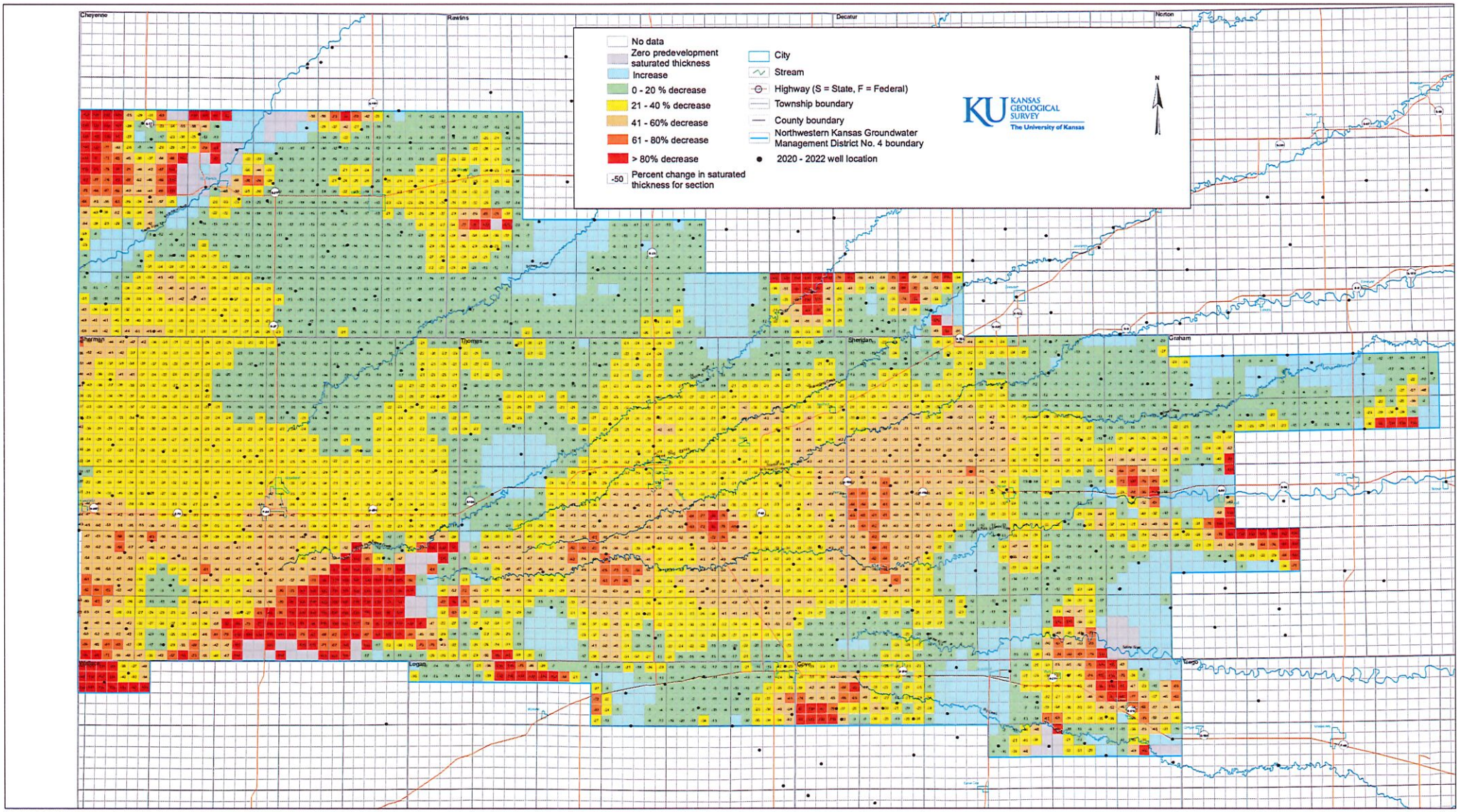
Northwestern Kansas Groundwater Management District No. 4

Prepared at the Kansas Geological Survey by John J. Woods and Brownie Wilson

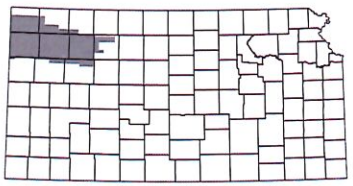
The change in mean saturated thickness within each section was calculated as follows:

1) Winter water level measurements taken between 2020 and 2022 were averaged at each well location.
2) An interpolated surface of the average 2020-2022 water table elevation was created from the well locations using ESRI's Topogrid tool and was assigned to sections.
3) Estimates of predevelopment and bedrock elevations within each section were taken from interpolated surfaces used in the GMD4 Groundwater Model (KGS OFR x).
4) For each section, the bedrock elevation was subtracted from the average 2020-2022 and predevelopment water table elevations to estimate the saturated thicknesses (ST).
5) The predevelopment ST was then subtracted from the average 2020-2022 ST to estimate the actual change.
6) Light yellow sections without a numeric value have zero computed change in saturated thickness.

Estimated Percent Change in Saturated Thickness, Predevelopment to Average 2020-2022, of the High Plains Aquifer in Northwestern Kansas GMD No. 4 (KGS Open-File Report 2022-x)



Projection Lambert Conformal Conic
Standard Parallels: 33 0 0 and 45 0 0 degrees North
Central Meridian: -98 15 0 degrees West
Latitude of Origin: 36 0 0 degrees North



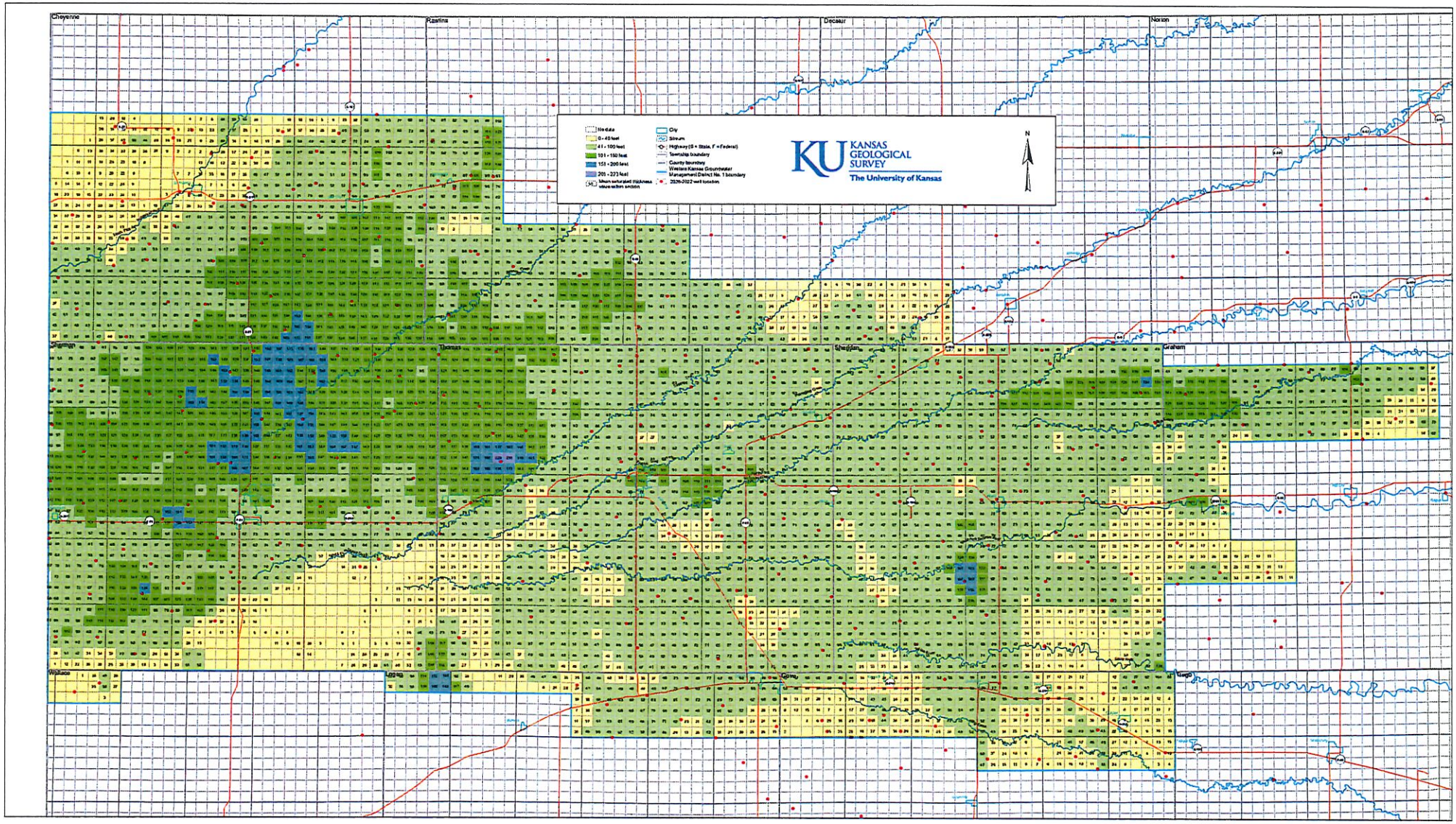
Northwestern Kansas Groundwater Management District No. 4

Prepared at the Kansas Geological Survey by John J. Woods and Brownie Wilson

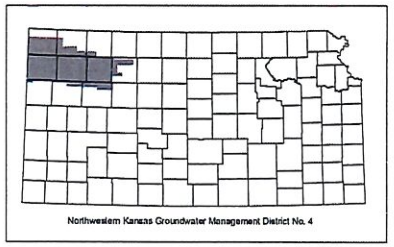
Estimates of percent change in saturated thickness within sections were calculated as follows:

1) Winter water level measurements taken between 2020 and 2022 were averaged at each well location.
2) An interpolated surface of the average 2020-2022 water table elevation was created from the well locations using ESRI's Topogrid tool and assigned to sections.
3) Estimates of the mean predevelopment and bedrock elevations within each section were taken from interpolated surfaces used in the GMD4 Groundwater Model (KGS OFR x).
4) For each section, the mean bedrock elevation was subtracted from the average 2020-2022 and predevelopment water table elevations to estimate the saturated thicknesses (ST).
5) The predevelopment ST was then subtracted from the average 2020 -2022 ST to estimate the actual change. The percent change was computed by dividing the actual change by the predevelopment ST.
6) Green sections without a numeric value have zero computed percent change in saturated thickness.

Estimated Average 2020-2022 Saturated Thickness of the High Plains Aquifer in Northwestern Kansas GMD No. 4 (KGS Open-file Report 2022-x)



Projection Lambert Conformal Conic
Standard Parallels: 33 0 0 and 45 0 0 degrees North
Central Meridian: -98 15 0 degrees West
Latitude of Origin: 36 0 0 degrees North



Prepared at the Kansas Geological Survey by John J. Woods and Brownie Wilson

The mean saturated thickness within each section was calculated as follows:

1) Winter water level measurements taken between 2020 and 2022 were averaged at each well location.
2) An interpolated surface of the average 2020-2022 water table elevation was created from the well locations using ESRI's Topogrid tool and assigned to sections.
3) Estimates of bedrock elevation within each section were taken from interpolated surfaces used in the GMD4 Groundwater Model (KGS OFR x).
4) For each section, the bedrock elevation was subtracted from the average 2020-2022 water table elevation to estimate the saturated thickness.
5) Shaded sections without a numeric value have zero saturated thickness.

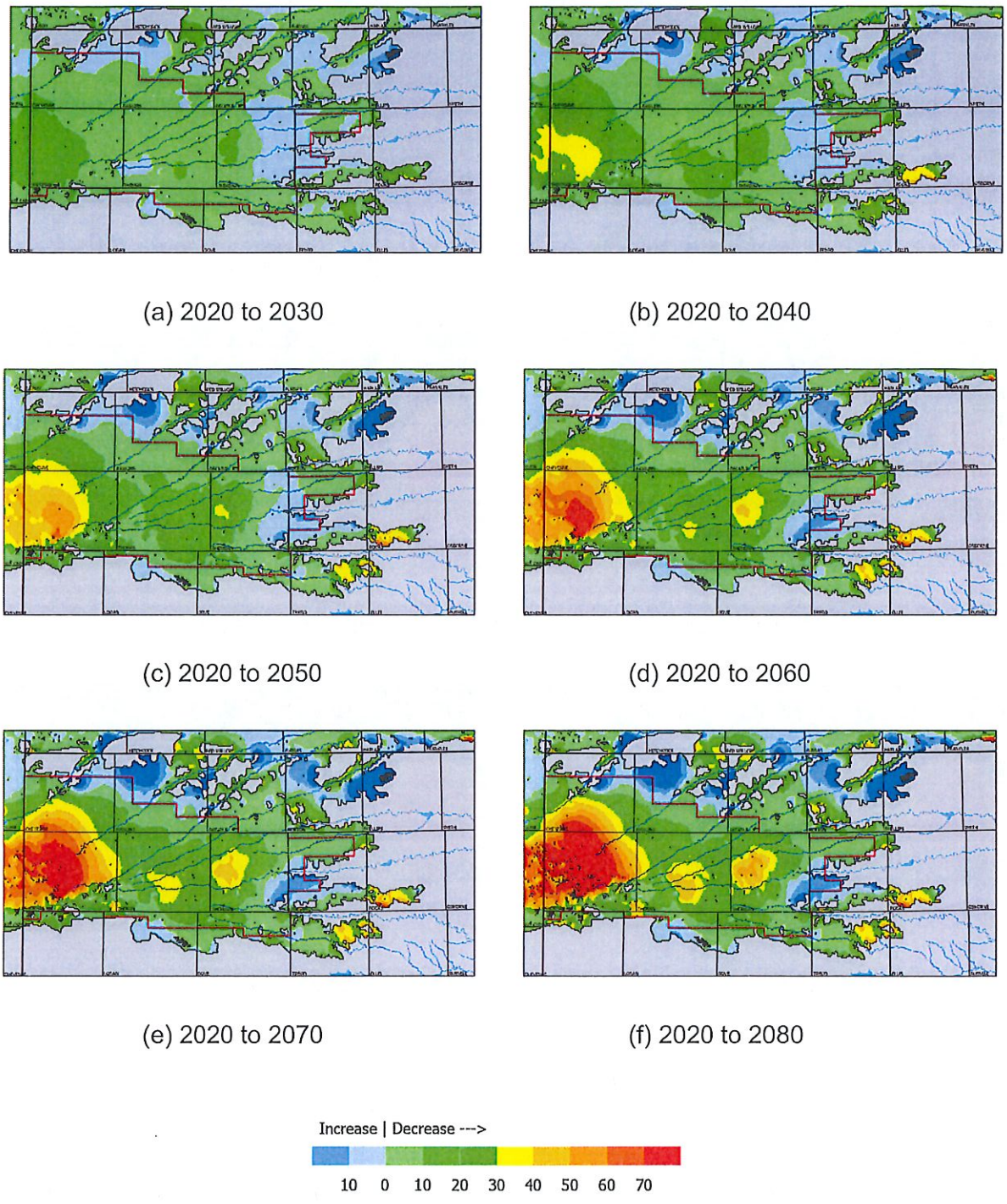


Figure 62. Simulated water-level change, in feet, for the no change in future water-use policy scenario.

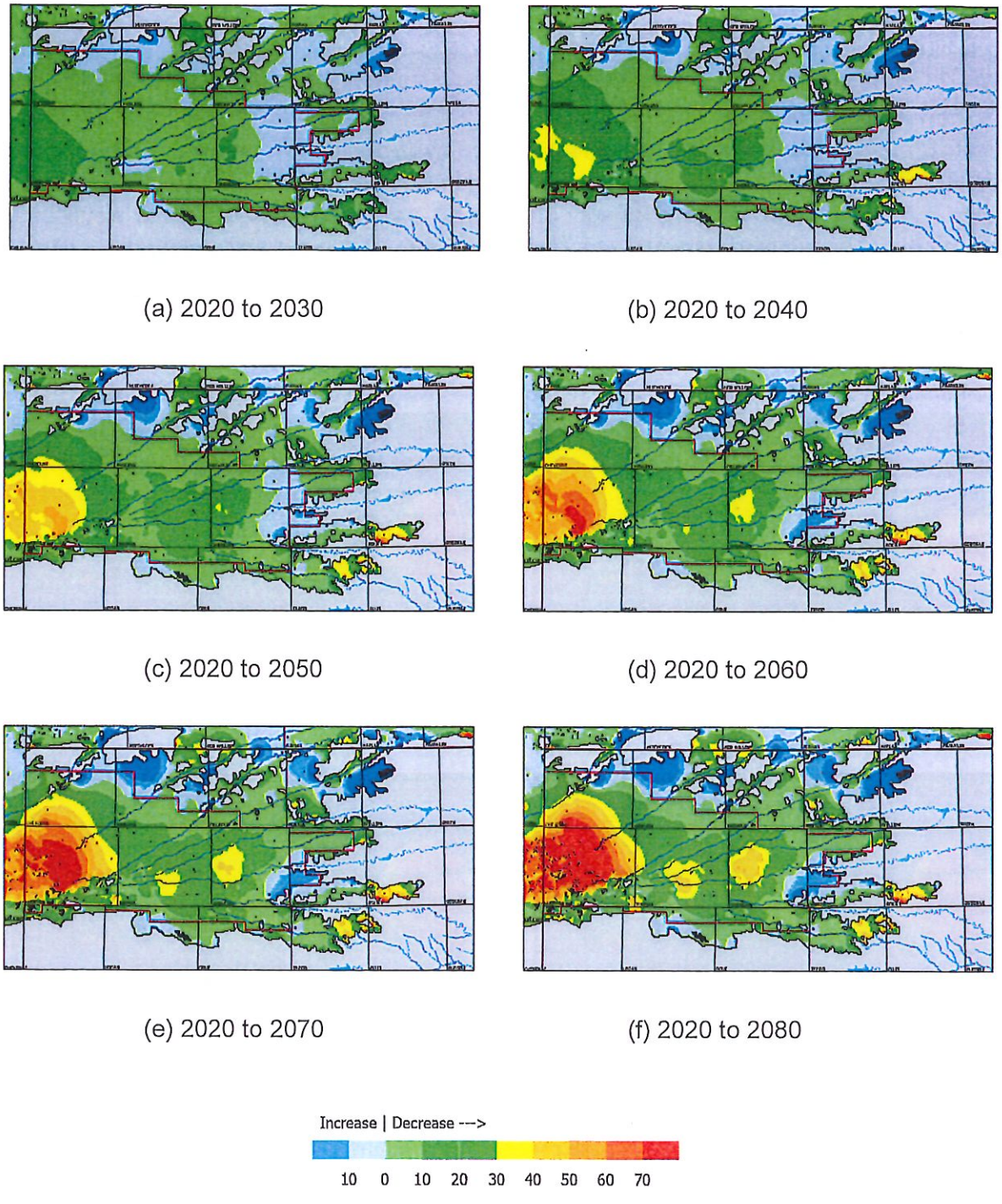


Figure 74. Simulated water-level change, in feet, for the district-wide LEMA future water use scenario.

GMD4- Status Quo- District Lema projected thickness

Scenario	Thickness_2030	Thickness_2040	Thickness_2050	Thickness_2060	Thickness_2070	Thickness_2080
Status Quo	67.00	61.92	57.03	52.08	48.11	43.35
District Lema	67.39	62.61	57.97	53.23	49.40	44.70

Sheridan County- Status Quo- District Lema projected thickness

Status Quo	53.66	51.05	47.64	42.83	40.02	36.34
District Lema	54.03	51.77	48.66	44.19	41.64	38.07

Sheridan County- Status Quo- District Lema projected thickness

Status Quo	87.39	76.16	64.85	53.60	43.21	32.93
District Lema	88.29	77.61	66.68	55.66	45.31	34.92

Exhibit 8

Annual irrigation water use,

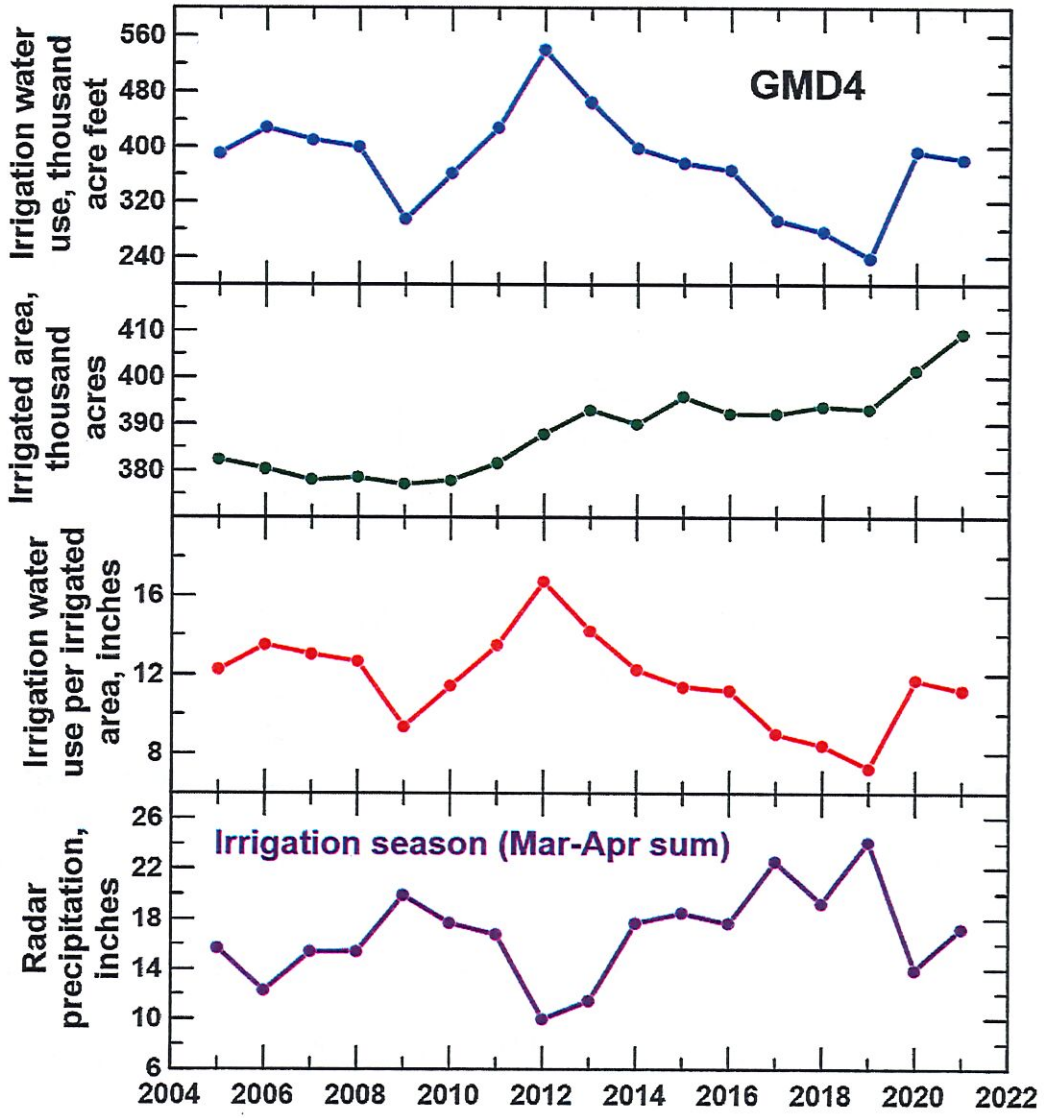
Irrigated area,

Annual irrigation water use per irrigated area,

and

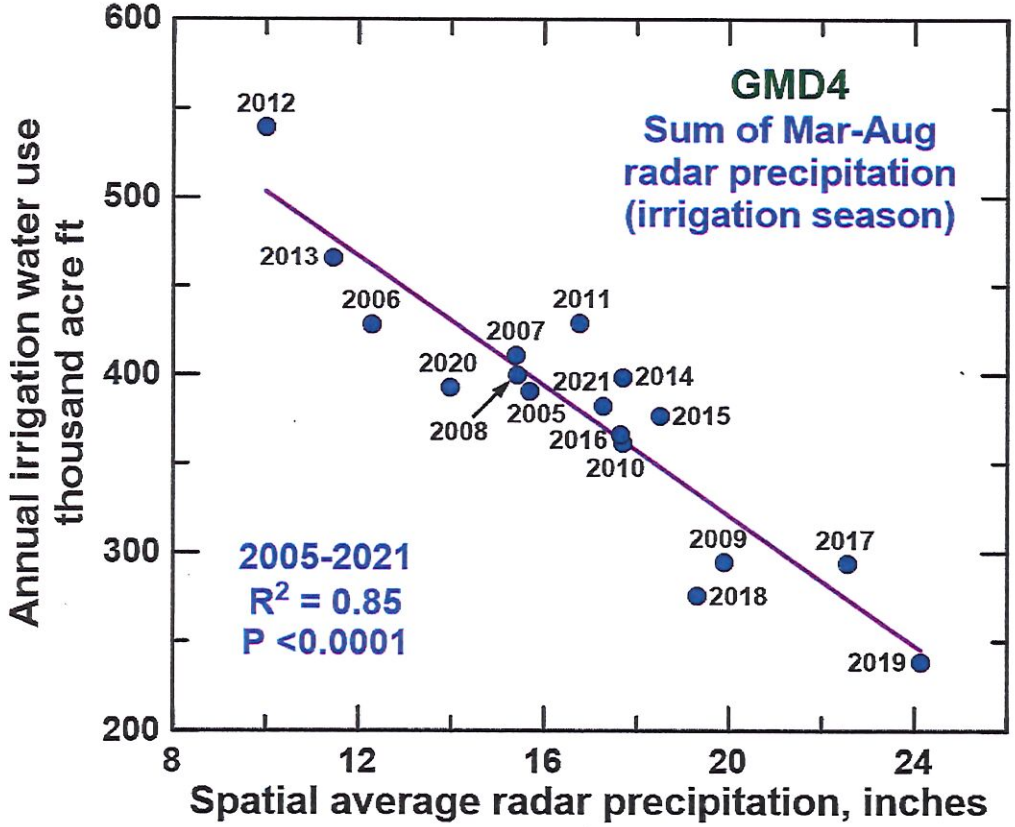
Spatial average radar precipitation

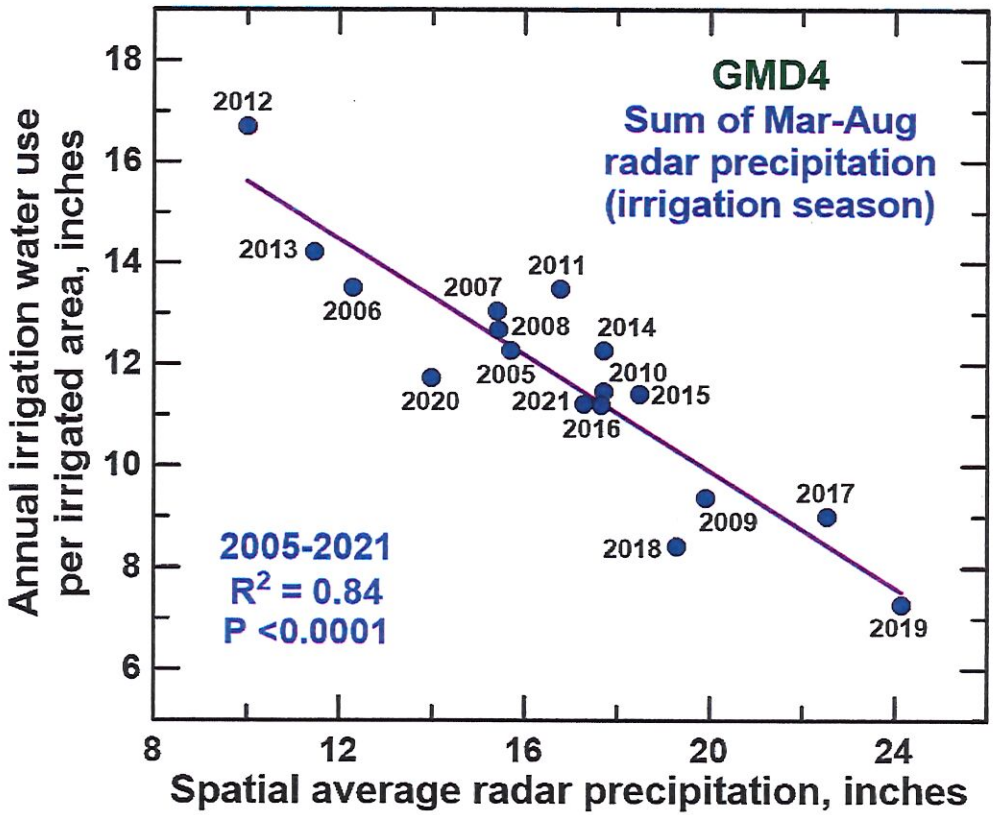
during 2005-2021



Kansas Geological Survey

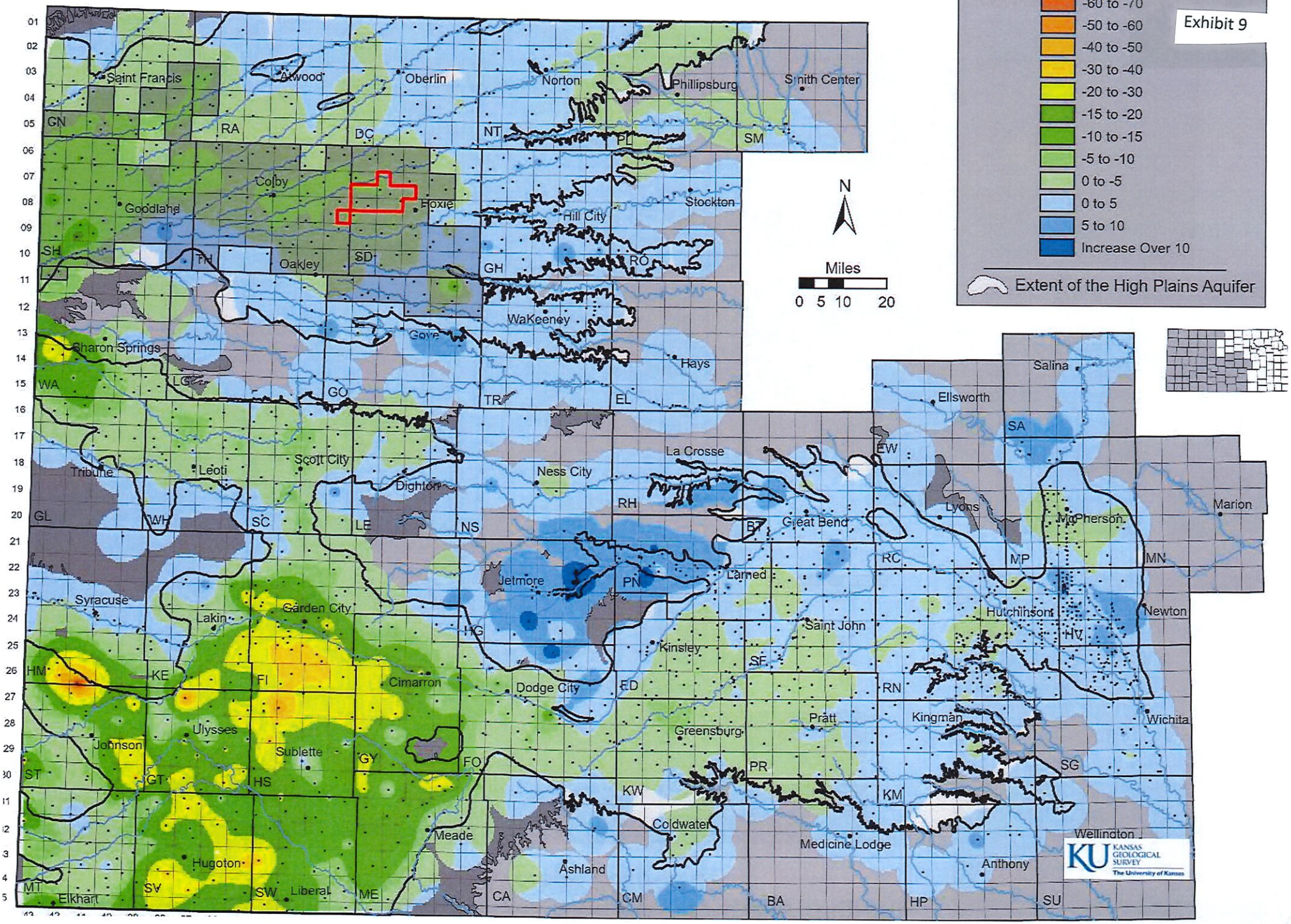
Northwest Kansas Groundwater Management District No. 4





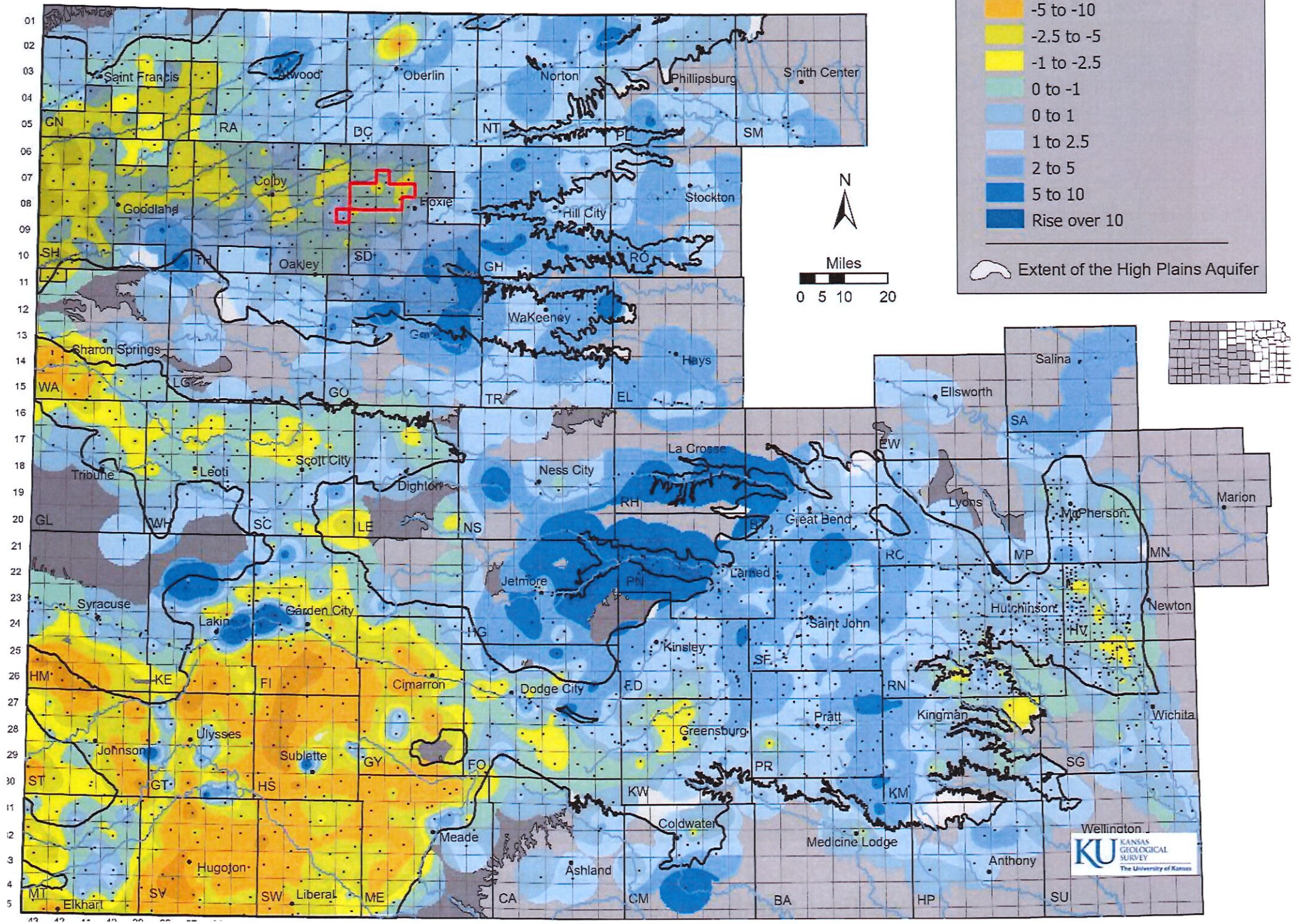
Kansas Geological Survey

Interpolated Water Level Change, Kansas High Plains Aquifer Region, Average 2011-2013 to Average 2020-2022

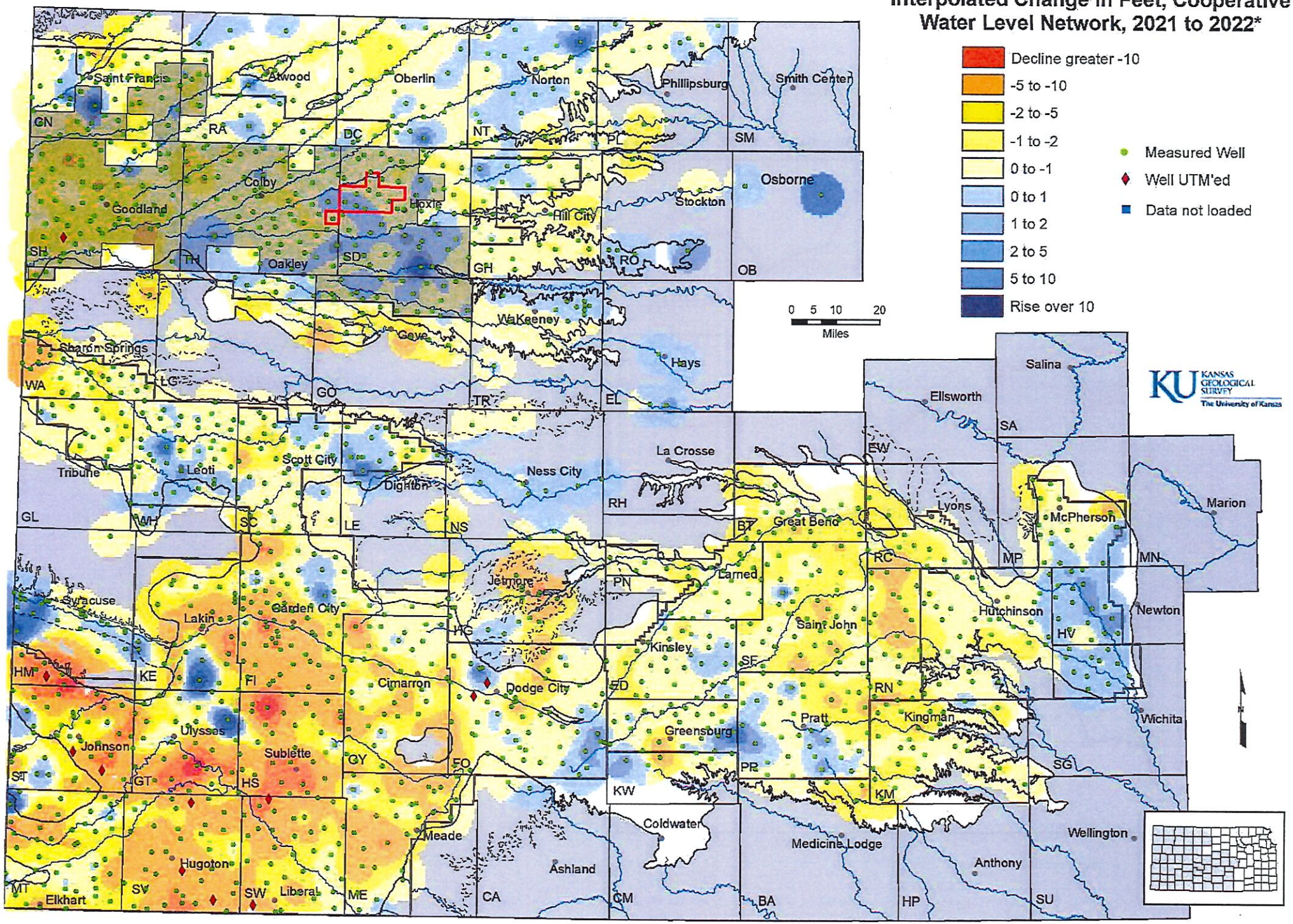


Interpolated Water Level Change, Kansas High Plains Aquifer Region, Average 2016-2018 to Average 2020-2022

Exhibit 8



Interpolated Change in Feet, Cooperative Water Level Network, 2021 to 2022*



*Results are based only on the cooperative network (KGS and KDA-DWR) and do not include sub-regional networks from the KGS, KDA-DWR or local GMDs.

3.4 GMD4 Index Wells

Eight index wells are located in GMD4, five of which have telemetry equipment that allows real-time viewing of data (fig. 22). The Thomas index well was one of the original 2007 index wells and had telemetry capabilities from the start. Monitoring with telemetry began at the Colby, Seegmiller Sheridan-6 (SD-6) LEMA, Sherman, and Steiger SD-6 LEMA index wells in 2015, 2016, 2017, and 2021, respectively. Table 4 summarizes characteristics of these eight wells. Further details concerning these wells are given in the 2016 annual report (Butler, Whittemore et al., 2017) and the online appendices for this report (www.kgs.ku.edu/HighPlains/OHP/index_program/index.shtml).

Table 4—Characteristics of the GMD4 index well sites.

Site	2021 WL elev. (ft)[a]	2021 saturated thickness (ft)	Bedrock depth (estimated ft below land surface)	Screened interval (ft below land surface)	2019 water use (ac-ft) 1 mi radius	2 mi radius	5 mi radius
Colby	3,024.4	97.4[b]	250–300	156–175	399[c]	1,708[d]	7,227[e]
SD-6 Baalman	NA[f]	NA	262	260–270	388	1,170	8,308[g]
SD-6 Beckman[h,i]	2,679.9[h]				489	1,817[j]	8,077[k]
SD-6 Moss[h]	2,624.4[h]	51.4	243	205–245	168	1,445	8,891[l]
SD-6 Seegmiller	2,738.5	70.5	265	225–265	425	1,674	8,593[m]
SD-6 Steiger[h]	2,850.7[h]	62.7	177	145–185	146	670[n]	5,293[o]
Sherman	3,614.5	143.5	323	310–320	1,263	2,543	8,656
Thomas	2,969.8	66.4	284	274–284	572	1,536	6,405

[a] 2021 annual tape water-level measurements from WIZARD database (http://www.kgs.ku.edu/Magellan/WaterLevels/index.html).
[b] Based on bedrock depth of 250 ft below lsf.
[c] Includes 212 ac-ft of municipal water.
[d] Includes 1,002 ac-ft of municipal water and 220 ac-ft of other water.
[e] Includes 1,158 ac-ft of municipal water, 220 ac-ft of other water, 1 ac-ft of industrial water, and 17 ac-ft of non-irrigation stock water.
[f] Annual measurement on 01/07/2021 is likely in error. Transducer measurements not available as sensor failed after 6/5/2020 and wasn't replaced until 3/20/2021.
[g] Includes 766 ac-ft of non-irrigation stock water.
[h] Not an annually measured index well; 2021 water-level measurements from hand measurements taken 01/7/2021 at Moss and Steiger.
[i] Well construction information not available.
[j] Includes 438 ac-ft of non-irrigation stock water.
[k] Includes 691 ac-ft of non-irrigation stock water.
[l] Includes 659 ac-ft of non-irrigation stock water, 1 ac-ft of industrial water, and 278 ac-ft of municipal water.
[m] Includes 691 ac-ft of non-irrigation stock water.
[n] Includes 30 ac-ft of non-irrigation stock water.
[o] Includes 50 ac-ft of non-irrigation stock water and 2 ac-ft of recreation water.

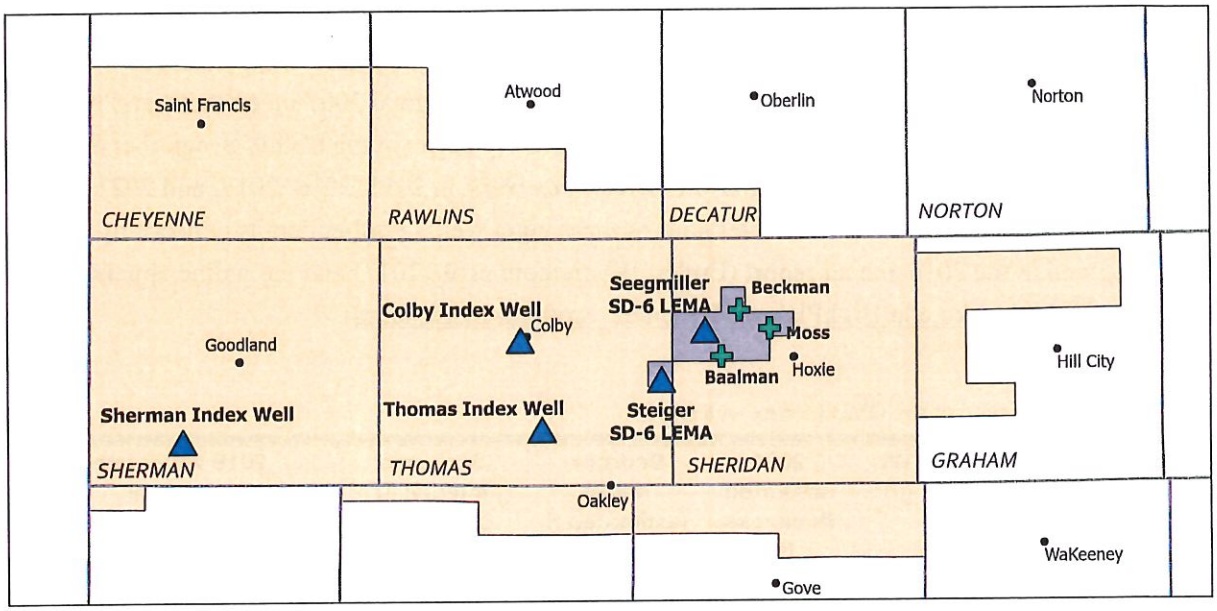


Figure 22—Map of index wells in GMD4. Triangles designate wells with telemetry equipment, whereas plus signs designate wells without telemetry equipment. Data from wells with telemetry equipment can be viewed in real time on the KGS website (www.kgs.ku.edu/HighPlains/OHP/index_program/index.shtml); data from wells without telemetry equipment are periodically downloaded (typically quarterly) and posted on the KGS website. Shaded area is the Sheridan-6 LEMA.

3.4.1 Colby Index Well

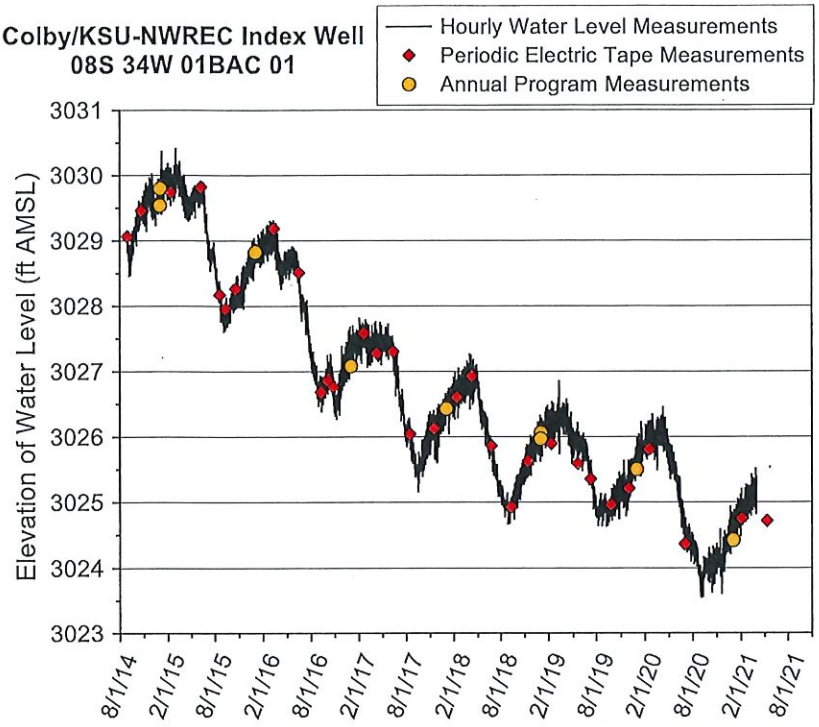


Figure 23—Colby index well hydrograph—total data run to 5/12/21. A water-level elevation of 3,029 ft corresponds to a depth to water of 148 ft below lsf. Total depth of the well is 175 ft below lsf (elevation of 3,002 ft). The screened interval extends from 156 to 175 ft below lsf. The base of the aquifer is estimated to be 250–300 ft below lsf (Butler, Whittemore et al., 2017). Sensor failed on 4/1/21 and was replaced on 5/12/21.

Major Points

- The relatively large amplitude fluctuations superimposed on the water-level record indicate unconfined conditions.
- After the end of the irrigation season, water levels continue to recover until the start of the next season; apparent stabilization of water levels in late winter and early spring of 2017 appears to be a product of nearby pumping.
- The maximum recovered water level has declined each year during the monitoring period, giving a distinct stair-step character to the hydrograph.
- Based on annual water-level measurements, the water level has declined approximately 0.88 ft/yr over the monitoring period and a total of 38.5 ft since January 1948.
- Transducer readings are in good agreement with manual measurements.

3.4.2 SD-6 Baalman Index Well

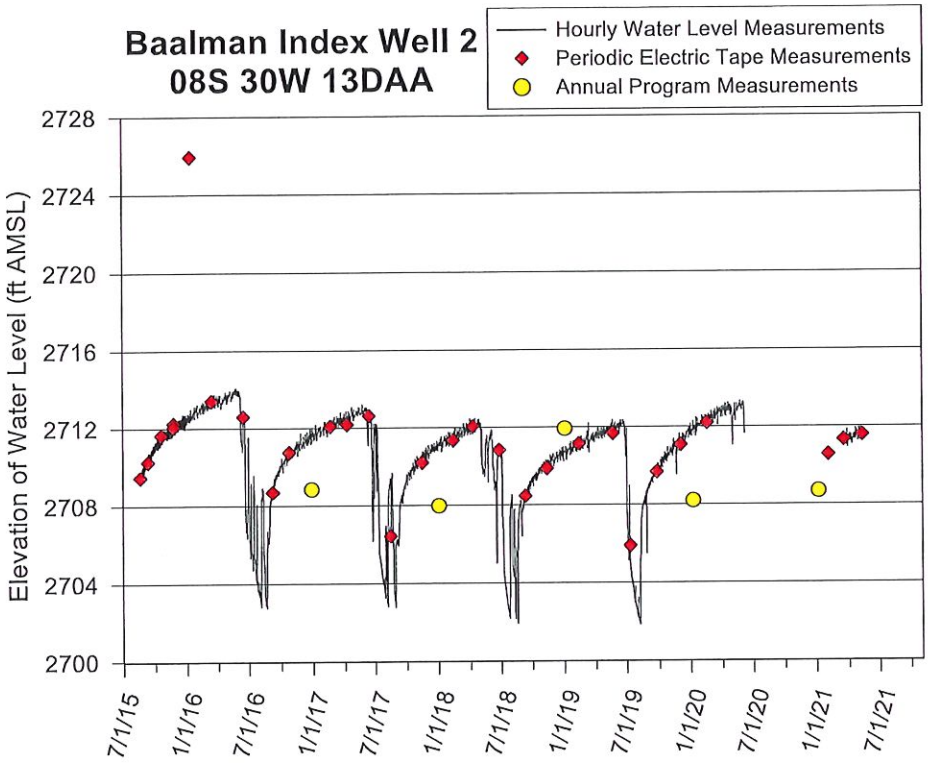


Figure 24—Baalman index well hydrograph—total data run to 5/12/21. A water-level elevation of 2,712 ft corresponds to a depth to water of 185 ft below lsf. The top of the 10 ft screen is 260 ft below lsf (elevation of 2,637 ft), and the bottom of the aquifer is 262 ft below lsf (elevation of 2,635 ft). The difference between the electric-tape and transducer measurements in January 2016 was caused by a malfunctioning electric tape.

Major Points

- The hydrograph form and the relatively large amplitude fluctuations superimposed on the water levels, particularly evident during the recovery period, are an indication of unconfined conditions.
- The effect of individual wells turning on and off is clearly visible, indicating pumping wells are in relatively close proximity to and in good hydraulic connection with the index well.
- The maximum water level in 2020 was above the previous three years as a result of the relatively small amount of pumping in 2019 (lowest pumping total and shortest pumping season [44 days] in the vicinity of the Baalman well [2 mi radius] since the establishment of the SD-6 LEMA).
- Since the establishment of the SD-6 LEMA, the water use per irrigated acre has been approximately 0.69 ft (8.3 inches)/acre in the vicinity of the Baalman index well (2 mi radius).
- Sensor failed on 6/5/20 but, because of the pandemic and the lack of telemetry, the failure was not recognized until 2/4/21; a new sensor was installed on 3/20/21.
- Transducer readings are in good agreement with periodic electric-tape measurements, except for the January 2016 measurement, but in poor agreement with annual program measurements.

3.4.3 SD-6 Beckman Index Well

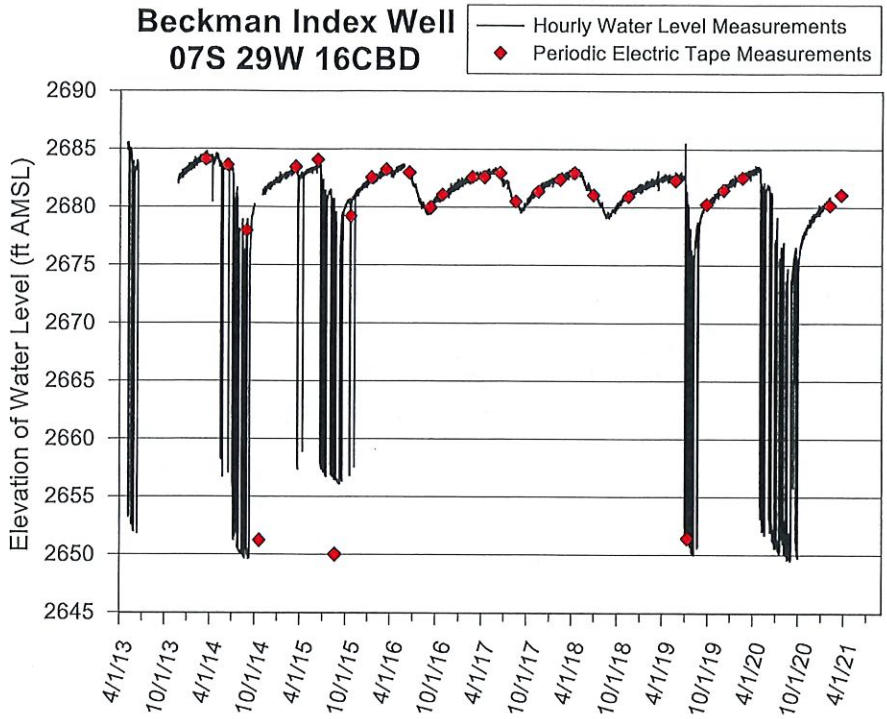


Figure 25—Beckman index well hydrograph—total data run to 3/20/21. A water-level elevation of 2,680 ft corresponds to a depth to water of 200.15 ft below lsf. The data gaps in 2013 and 2014 were caused by datalogger battery problems. The difference between the electric-tape measurement in the summer of 2015 and the hourly measurements from the transducer is thought to be caused by a change in transducer calibration specifications associated with the resumption of monitoring in late October 2014.

Major Points

- The irrigation well adjacent to the Beckman index well was pumped for the second time in the last five irrigation seasons and the fifth time since the establishment of the SD-6 LEMA.
- The hydrograph form and the relatively large amplitude fluctuations superimposed on the water levels, particularly evident during the recovery period, are an indication of unconfined conditions.
- After the end of the irrigation season, water levels continue to recover until the start of the next season (water levels never stabilize).
- Since the establishment of the SD-6 LEMA, the water use per irrigated acre has been approximately 0.69 ft (8.3 in)/acre in the vicinity of the Beckman index well (2 mi radius).
- Sensor failed on 2/4/21 and was replaced during site visit on 3/20/21. However, the sensor could not be downloaded during the 5/12/21 visit because the site could not be accessed without damaging the winter wheat crop.
- Transducer readings are in good agreement with manual measurements in the latter half of the monitoring period.

3.4.4 SD-6 Moss Index Well

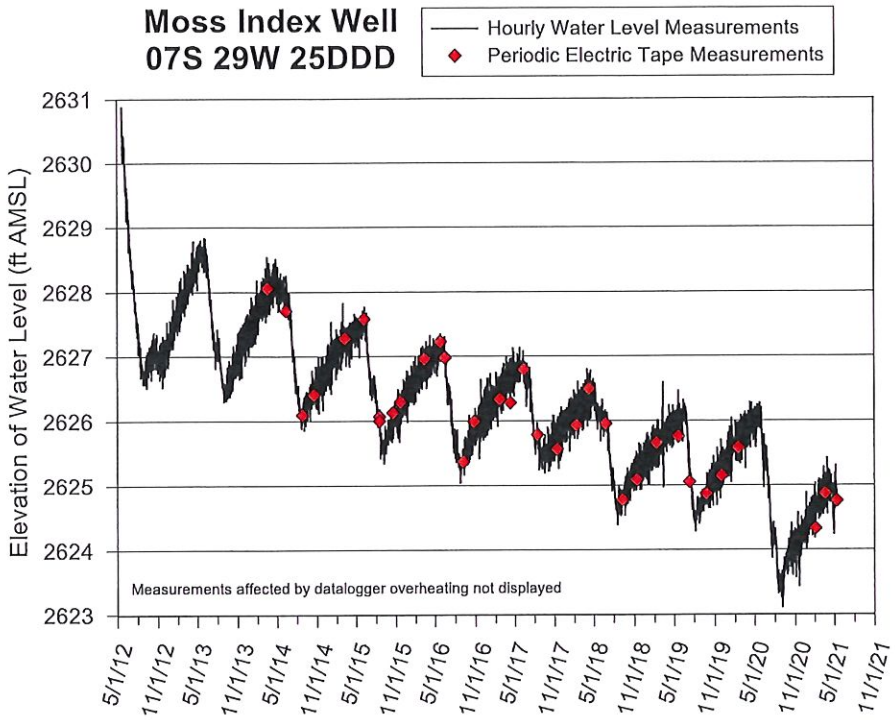


Figure 26—Moss index well hydrograph—total data run to 5/12/21. A water-level elevation of 2,627 ft corresponds to a depth to water of 189.0 ft below lsf. The top of the 40 ft screen is 205 ft below lsf (elevation of 2,611.0 ft), and the bottom of the aquifer is 243 ft below lsf (elevation of 2,573.0 ft).

Major Points

- The relatively large amplitude fluctuations superimposed on the water levels, particularly evident during the recovery period, are an indication of unconfined conditions.
- After the end of the irrigation season, water levels continue to recover until the start of the next season (water levels never stabilize).
- The minimum water-level elevation has been above that of the preceding year once (2017, a wet year). Otherwise, the hydrograph displays a downward stepping pattern.
- Since the establishment of the SD-6 LEMA, the water use per irrigated acre has been approximately 0.79 ft (9.5 in)/acre in the vicinity of the Moss index well (2 mi radius).
- Transducer readings are in good agreement with manual measurements.

3.4.5 SD-6 Seegmiller Index Well

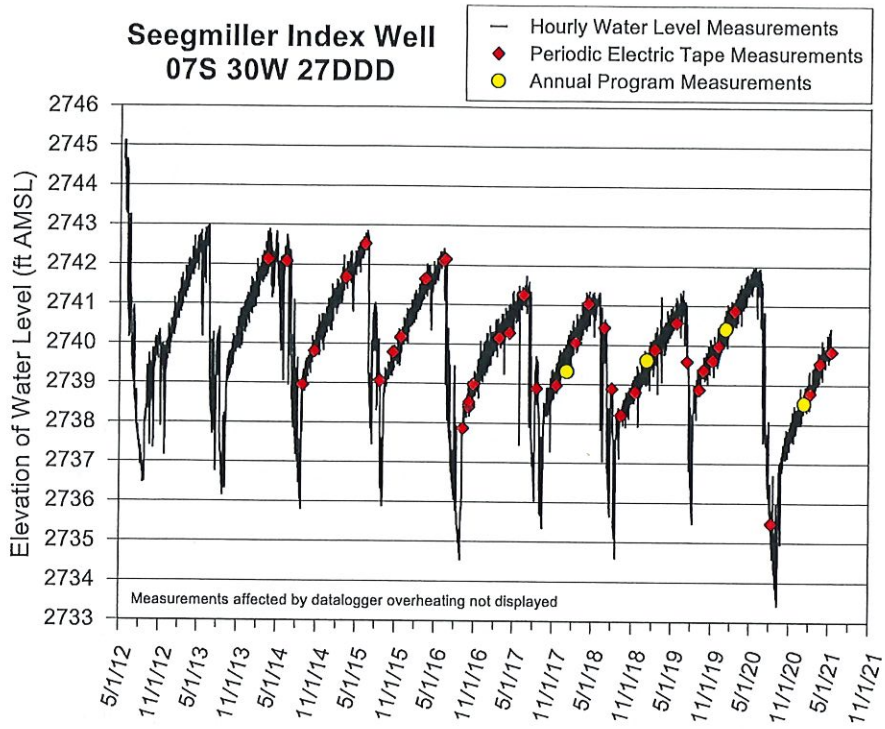


Figure 27—Seegmiller index well hydrograph—total data run to 5/12/21. A water-level elevation of 2,740 ft corresponds to a depth to water of 193.0 ft below lsf. The top of the 40 ft screen is 225 ft below lsf (elevation of 2,708.0 ft), and the bottom of the aquifer is 265 ft below lsf (elevation of 2,668.0 ft).

Major Points

- The hydrograph form and the relatively large amplitude fluctuations superimposed on the water levels, particularly evident during the recovery period, indicate unconfined conditions.
- The effect of individual wells turning on and off is clearly visible on the hydrograph, indicating pumping wells in relatively close proximity to and in good hydraulic connection with the index well.
- After the end of the irrigation season, water levels continue to recover until the start of the next season (water levels never stabilize).
- The minimum water-level elevation for 2020 was 2.1 ft below that of 2019 and 1.2 ft below that of 2018, which was the previous lowest level observed during the monitoring period. The increase in maximum water-level elevations between 2019 and 2020 was the largest (0.6 ft) observed during the monitoring period because of the small amount of pumping in 2019 (lowest during the monitoring period and about 24% lower than the previous low [2017]).
- Since the establishment of the SD-6 LEMA, the water use per irrigated acre has been approximately 0.71 ft (8.5 in)/acre in the vicinity of the Seegmiller index well (2 mi radius).
- Transducer readings are in good agreement with manual measurements.

3.4.6 SD-6 Steiger Index Well

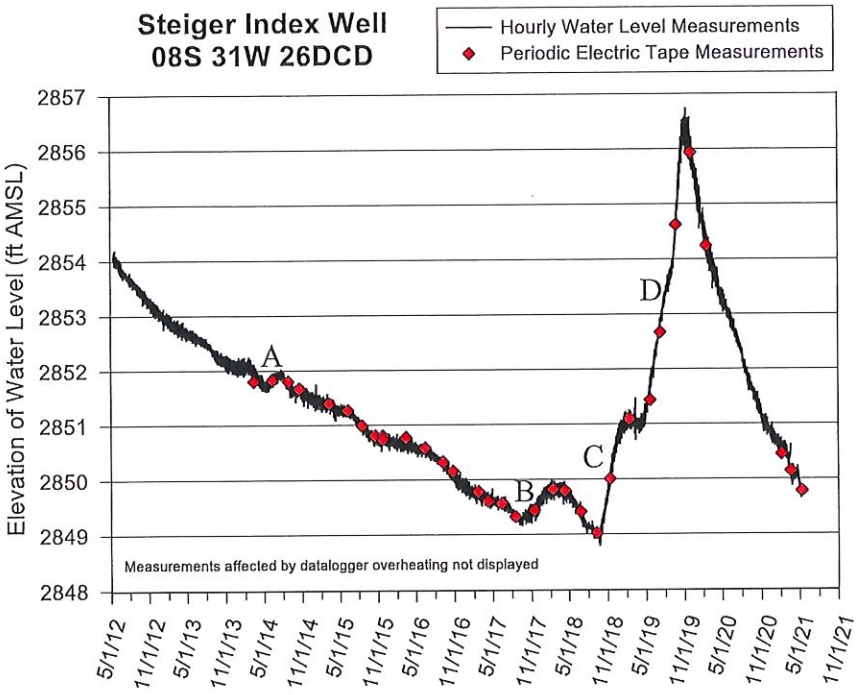


Figure 28—Steiger index well hydrograph—total data run to 5/12/21. A water-level elevation of 2,851 ft corresponds to a depth to water of 114.0 ft below lsf. The top of the 40 ft screen is 145 ft below lsf (elevation of 2,820.0 ft), and the bottom of the aquifer is 177 ft below lsf (elevation of 2,788.0 ft). A–D defined in text.

Major Points

- The fluctuations superimposed on the water levels are an indication of unconfined conditions but are of smaller magnitude than the other index wells in GMD4; this small magnitude typically indicates a relatively shallow depth to water.
- It is difficult to discern individual pumping seasons. The humps and troughs observed in the hydrograph at points marked A–D are likely related to a series of episodic recharge events and not pumping. The Steiger index well is located near an impoundment behind a small dam over an ephemeral stream channel; the impoundment appears to serve as a site of focused recharge.
- The effect of individual wells cutting on and off cannot be discerned.
- Except for a short decline early in the 2019 irrigation season, water levels rose continuously from the end of the 2018 pumping season to November 2019. This rise (>7.5 ft) is the only definitive example of episodic recharge that we have observed in the index wells in western Kansas. The sharp decline since the peak in November of 2019 indicates that the recharge was likely a localized event (i.e. water flows laterally to areas that did not receive the recharge) associated with the nearby impoundment (Butler, Knobbe et al., 2021). Comparison of the rise in water level with area rainfall indicates that the recharge pulse appears to have taken a little over a year to reach the water table.
- Since the establishment of the SD-6 LEMA, the water use per irrigated acre has been approximately 0.78 ft (9.3 in)/acre in the vicinity of the Steiger index well (2 mi radius).
- Transducer readings are in good agreement with manual measurements.

3.4.7 Sherman County Index Well

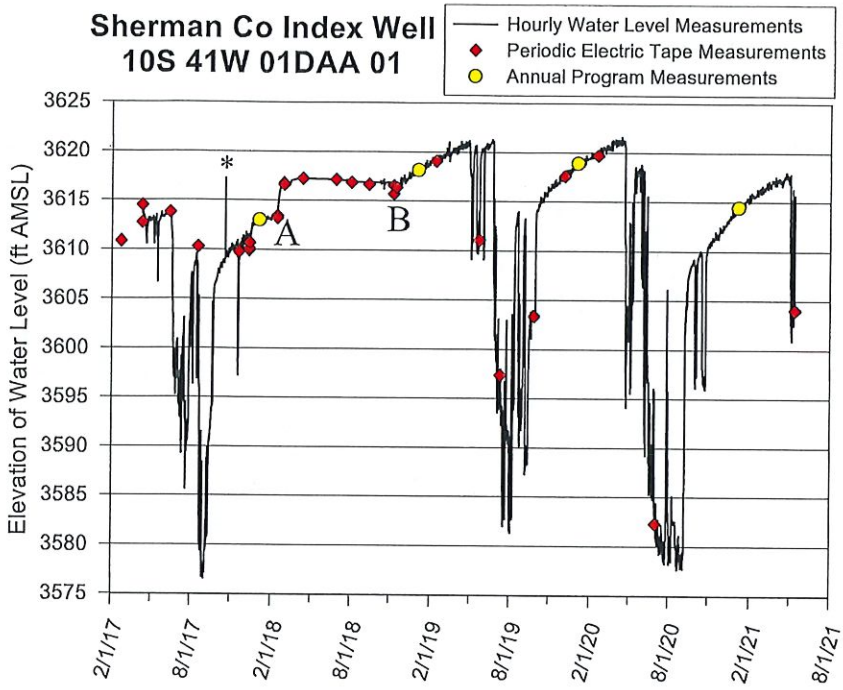


Figure 29—Sherman County index well hydrograph—total data run to 5/13/21. A water-level elevation of 3,617 ft corresponds to a depth to water of 177 ft below lsf. The top of the 10 ft screen is 310 ft below lsf (elevation of 3,484 ft), and the bottom of the aquifer is 323 ft below lsf (elevation of 3,471 ft). The well has a 10 ft sump that extends to 330 ft below lsf. The asterisk indicates a single spurious reading; A and B defined in text.

Major Points

- The hydrograph form and the relatively large amplitude fluctuations superimposed on the water levels, particularly evident during the recovery period, indicate unconfined conditions.
- The effect of individual wells turning on and off is clearly visible on the hydrograph, indicating pumping wells in relatively close proximity to and in good hydraulic connection with the index well.
- The well was not developed immediately after installation because of extreme cold. As a result, the screened interval gradually filled with fine-grained sediments. During the period from 2/13/18 (A on plot) to 11/7/18 (B on plot), the screened interval appears to have been in very poor hydraulic connection with the aquifer. Well development on 11/7/18 (B) reestablished the hydraulic connections between the well and the aquifer (Butler, Knobbe et al., 2021).
- After the end of the irrigation season, water levels continue to recover until the start of the next season (water levels never stabilize).
- Agreement between transducer readings and manual measurements varied over the monitoring period; agreement appears good after a new sensor was installed on 2/13/18 (A).

3.4.8 Thomas County Index Well

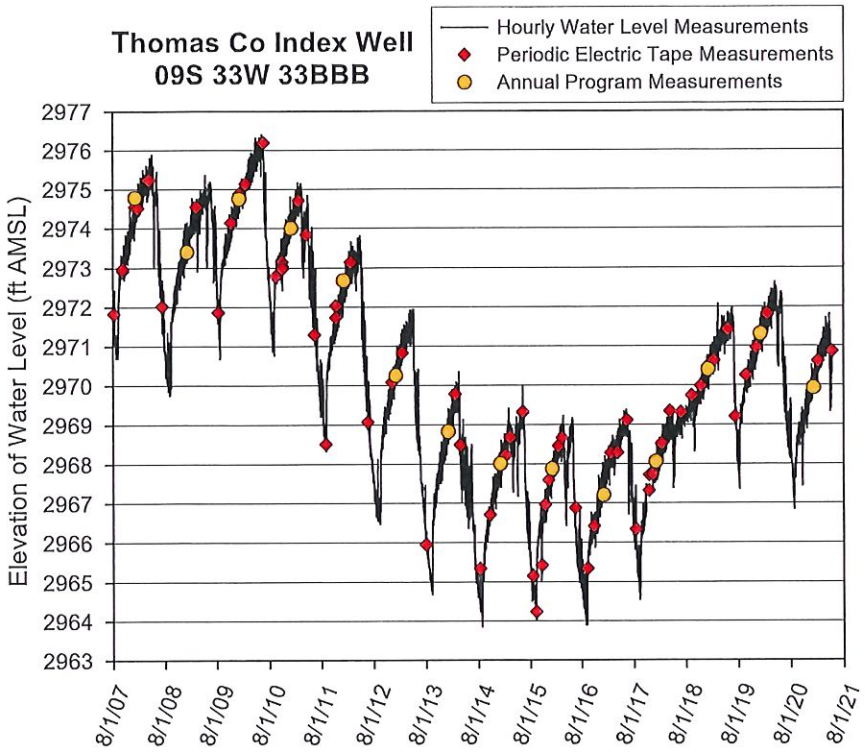


Figure 30—Thomas County index well hydrograph—total data run to 5/12/21. A water-level elevation of 2,968 ft corresponds to a depth to water of 219.56 ft below lsf. The top of the screen is 274 ft below lsf (elevation of 2,913.6 ft), and the bottom of the aquifer is 284 ft below lsf (elevation of 2,903.6 ft). The screen terminates at the bottom of the aquifer. No water-level data are available from 10/28/17 to 12/11/17 because of sensor failure.

Major Points

- The hydrograph form, the relatively small change and rate of change in water level during each pumping and recovery season (despite eight high-capacity pumping wells within a mile of the index well), and the relatively large amplitude fluctuations superimposed on water levels indicate unconfined conditions.
- The effect of individual wells turning on and off is clearly visible on the hydrograph, indicating pumping wells in relatively close proximity to and in good hydraulic connection with the index well.
- After the end of the irrigation season, water levels continue to recover until the start of the next season (water levels never stabilize).
- The maximum water level in 2020 was 0.5 ft above that in 2019 and the highest since 2012.
- 2018 water use was the lowest for the monitoring period because of cessation of pumping after a hail storm in late spring 2018 that destroyed the crops in the vicinity of the index well. 2019 water use was the second lowest for the monitoring period and 1.9 times greater than that in 2018.
- Transducer readings are in good agreement with manual measurements.