
From: Barfield, David
Sent: Friday, May 5, 2017 3:32 PM
To: 'Mark Rude'; Kirk Heger (kirkheger@gmail.com); Kirk Heger (ag1stkh@pld.com)
Cc: Beightel, Chris; Metzger, Susan; Letourneau, Lane; Jason Norquest; Chris Law; Trevor Ahring
Subject: RE: GMD 3 management program update discussion
Attachments: Draft-MP-GMD3-2017-03-31wDWRcomments_2017-05-05.docx

Mark,

Per your request, attached is a markup with comments and suggestions on your 3/30/2017 version for your informal use. We had the core of this done early April but did not send it to you as we did not have sufficient time to finalize it before your subsequent drafts arrived. So we opted instead to provide the general comments and advice in my email of Monday.

Today, Chris, Mike and I reviewed the previous work and updated it some based on our discussion Tuesday. Our review was partial. I know we are 2-3 drafts behinds. **Use what is useful.** If you have questions, let us know as, just as we failed to understand some of your text without discussion, I am sure the same will be true of our comments and suggestions herein.

Chris mentioned the Western States Water Councils policy statements as model you might consider for material not necessary to a management program. See <http://www.westernstateswater.org/policies-2/> for a listing of their policy statements and examples.

We can do another review on your next version of the draft management program when you think appropriate.

David

From: Mark Rude [mailto:mrude@gmd3.org]
Sent: Wednesday, May 3, 2017 6:12 PM
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Cc: Beightel, Chris <Chris.Beightel@ks.gov>; Metzger, Susan <Susan.Metzger@ks.gov>; Letourneau, Lane <Lane.Letourneau@ks.gov>; Jason Norquest <norquest@gmd3.org>; Chris Law <claw@gmd3.org>; Trevor Ahring <trevora@gmd3.org>
Subject: RE: GMD 3 management program update discussion

David,

Thank you so much for taking the time to sit down with Mike, Chris, my staff, Mike McNiece, Mike O'Brate and Kirk Heger. I will be working to revise the management program some with the few priority tasks and immediate actions to accomplish them, based on our discussion.

We also began reviewing a list of comments you had identified, but ran out of time to hear but only a couple. As discussed at the end of the meeting, would you be willing to send your notes to us where we can consider them informally as we attempt to improve the draft document at the staff level for further board consideration next week?

Thanks again,
Mark

Mark E Rude

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Cc: Beightel, Chris <Chris.Beightel@ks.gov>; Metzger, Susan <Susan.Metzger@ks.gov>; Letourneau, Lane <Lane.Letourneau@ks.gov>
Subject: GMD 3 management program update discussion

Mark and Policy Board members,

We appreciate the opportunity to collaborate with you as you draft your management program update. KDA-DWR and the district have the same compelling reasons to ensure that GMD3 has a meaningful, achievable management plan and the support to implement it. We sent along some general advice on management program updates in our March 6, 2017 letter to you (attached). After reviewing your recent drafts, we've prepared some additional comments and guidance to keep us moving towards a successful update of your plan.

The GMD Act defines a management program as, "*a written report describing the characteristics of the district and the nature and methods of dealing with groundwater supply problems within the district...*" GMD3's plan needs to lay out the district's water supply problems and the board's plan of action, under the existing statutes, rules and regulations, in a specific, concise, understandable way; no more, no less.

The management program is not the appropriate venue to discuss policy positions or stake out opinions on "water governance", re-interpretation and commentary on statutes, and such.

It is both your mission and ours to fulfill the respective purposes and roles prescribed to us by the Legislature. While the chief engineer is singularly responsible for administration the state's water rights, GMDs are tasked with recommending rules and acting via the powers prescribed to them in K.S.A. 82a-1028 to advance groundwater management within the Districts. Your management plan update should give particular attention to recent years legislation granting additional tools to address your water resource challenges within the District (LEMAs, WCAs, legislation aimed to remove disincentives to reduce use).

Thus, the plan needs to be a simple, clear document, defining specific problems, laying out specific goals (how much of the problem is going to be solved, and when), and specific actions (what is going to be done, and when) to solve those problems within the GMD's role and powers granted by the Legislature.

For instance, in the most recent draft one of your commitments is to "promote water use efficiency through new technology implementation". This worthy goal should be followed with a commitment and plan to achieve it, such as, "by March 31, 2018, the district will implement a cost-sharing program and will commit up to 10% of the district's assessments to the program to help its constituents implement water saving technology." Another statement in the recent draft says the district will, "reduce the rate of water level decline a minimum of 1% per year". There needs to be a plan for how this will happen.

As we have interacted with the board and membership, particularly over the last three years, we sense a heightened awareness of the problem of over-appropriation and a desire to do something tangible about it. We believe this growing consensus and the new tools developed in recent years (LEMAs, WCAs, revised MYFA for example) provide an historic opportunity for GMD 3 to take the lead in promoting and achieving water conservation that can sustain the region's economy into the future.

We look forward to continuing to work with you on your management plan update and will be happy to have further discussions with the board on how to best use this opportunity to serve our water users.

David

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2017 (DRAFT REVISED) Management Program
DWR 5/5/2017 comments on 3/31/2017 draft

**Southwest Kansas Groundwater Management District Number 3
(GMD3)**

2009 E. Spruce Street, Garden City, Kansas 67846 (620)275-7147

URL: [HTTP://www.gmd3.org](http://www.gmd3.org)



The map shows the outline of the state of Kansas. A smaller inset map in the top left corner is titled "WATER MANAGEMENT FOR SOUTHWEST KANSAS" and shows the "GMD3" area in blue. Below this is a larger map of the same area, with county names labeled: Hamilton, Kearny, Finney, Stanton, Grant, Haskell, Gray, Ford, Morton, Stevens, Seward, and Meade. The GMD3 territory is highlighted in blue on both maps.

2017 Board of Directors:

Kirk Heger, President - Stevens County
Bret Rooney, Vice President - Haskell County
Mike McNiece, Secretary - Industrial at large
Mike O'Brate, Treasurer - Gray County

Fred Claassen, Director - Morton County
Kent Dunn, Director - Seward County
~~Doug Fox, Director - Meade County~~
Zachary Gale, Director - Hamilton County
Randy Hayzlett, Director - Surface Water at large
Fred Jones, Director - Municipal at large
Seth Nelson, Director - Stanton County
Jeff Reinert, Director - Ford County
Hal Scheuerman, Director - Kearny County
Clay Scott, Director - Grant County
Steve Stone, Director - Finney County

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MANAGEMENT PROGRAM PURPOSE

Water is the key resource for the present and future prosperity of all. There are other resources which may mean the difference between wealth and poverty, such as oil, gas or wind, but none is a fundamental necessity for our existence and nearly all other economic development. Groundwater has been the predominant source of water for the District and will continue that way as new ways to use and conserve water are employed into the future.

Groundwater governance management framework. The Southwest Kansas Groundwater Management District No. 3 (GMD3) Management Program document ~~is intended to provide~~ provides a ~~groundwater governance framework plan~~ for the ~~groundwater sources near- and long-term management of the district's groundwater and describe the services to District eligible voters from this critical declining natural resource provided by the district to its constituents.~~ The Management Program document provides a basis for the formal and informal norms and practices adopted for managing the local groundwater resources to best protect the equities, investments, and resource services from available usable groundwater in the public interest. An up-to-date management program document is necessary to ~~aid~~ coordinate the district's efforts with those of state agencies and others in solving water supply problems. Any revision of state administrative rules that may alter the management program standards for the District, other than emergency rules, should occur only after the process for revising the Management Program Document has occurred as prescribed by law. Following the process for revising the management program will assure proper implementation of rights and responsibilities delegated to the District in the Kansas Groundwater Management District Act, the State Water Resources Planning Act and the Kansas Water Appropriation Act. This in turn gives structure to consider and set needed planning, regulations and practices that govern the present and future District water supply in the public interest.

Local groundwater **governance management** can be difficult for many reasons, including:

1. Groundwater is a shared resource;
2. Groundwater inflows and outflows are difficult to observe and cannot be measured directly;
3. Surface and groundwater are interconnected;
4. Aquifer boundaries and characteristics may be locally unknown or poorly defined;
5. Groundwater management requires specialized tools like supply and economic models;
6. Groundwater conditions can vary on multiple time scales;
7. Groundwater use can pit present needs against future needs; especially in declining aquifers;
8. Diverse local, state and federal interests, institutions and authorities require significant coordination activity to accomplish productive partnerships that accomplish ~~the purposes of the groundwater governance~~ effective management in the public interest.

Kansas Water Policy: The Kansas Groundwater Management District Act (GMD Act) (K.S.A.82a-1020 et. seq.) does not specify how GMD's should ~~act to advance govern~~ local groundwater **management resources**, nor does it provide details on the interplay between federal, state and local actions, except to maintain that effective groundwater management programs are best developed and adopted locally, ~~and must comport with state laws and policies.~~ The GMD Act declares two key concepts of Kansas water policy:

Commented [BD1]:

The section seems writing less from the perspective that the MP is to guide the GMD's action to improve the Region's future and more from a perspective that the GMD's role is "groundwater governance." Consider moving to Policy Document

Commented [HK2]:

This is inconsistent with GMD act definition and purpose of a MP as "a written report describing the characteristics of the district and the nature and methods of dealing with groundwater supply problems within the district. It shall include information as to the groundwater management program to be undertaken by the district and such maps, geological information, and other data as may be necessary for the formulation of such a program."

Commented [HK3]:

The MP is principally to guide the GMD's actions; not others.

Commented [HK4]:

This goes against K.S.A. 82a-1039. No limitation of authority of chief engineer. ... We can't have our rule making subjected to 5 GMD's updating their plans.

- 1) “Nothing in this act shall be construed as limiting or affecting any duty or power of the chief engineer granted pursuant to the Kansas water appropriation act.”
- 2) “... preserve basic water use doctrine and to establish the right of local water users to determine their destiny with respect to the use of the groundwater insofar as it does not conflict with the basic laws and policies of the state of Kansas.”

More recently, Kansans have favored collective conservation program initiatives over strict application of some historical western water law doctrines that constrain efficient groundwater management. This has occurred primarily in declining and non-replenishing groundwater aquifer areas when the doctrine of beneficial use requires use or water right owners risk suffering loss of rights to use water, which frustrates conservation efforts. Or, the doctrine of prior appropriation contemplates earlier (senior) water rights must be satisfied before later in time (junior) rights can access water, which also inhibits collective conservation and water use benefits, use efficiencies and the public interest. Improved modern access to water data and information has allowed water policies to have adaptive implementation and for institutional tools to be added that accommodate more informed and efficient groundwater supply management in near real time conditions and for future needs. Significant work remains in education and implementation of effective groundwater conservation strategies from on site management of water to District wide programs. Equally important is the intrastate and interstate policy development to facilitate water transportation infrastructure projects to meet the future needs for water and energy services.

Commented [BD5]: This paragraph seems more editorial in nature and unclear; move to policy document. We don't agree that our water law constrains efficient groundwater management or inhibits collective conservation. We have tools

GMD3 MISSION STATEMENT

Act on a shared commitment to conserve and develop water supply to grow the social, economic and natural resources well-being for current and future generations in the public interest.

In 1972 the Kansas Legislature ratified the Groundwater Management District Act to affirm rights to locally formed Districts of organized land owners and water users that implement the policies of the legislature ~~and interpret basic water use doctrine consistent with state law through actions consistent with the powers bestowed to GMDs in the Act and as identified in the creation and regular revisions to a groundwater management program.~~ The first ~~law-~~~~contained~~section in the act challenged each District with a mission founded in the following declaration:

K.S.A. 82a-1020. Legislative Declaration: It is hereby recognized that a need exists for the creation of special districts for the proper management of the groundwater resources 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 for Kansas the benefit of its fertile soils and favorable location with respect to national and world markets. It is the policy of this act to preserve basic water use doctrine and to establish the right of local water users to determine their destiny with respect to the use of the groundwater insofar as it does not conflict with the basic laws and policies of the state of Kansas. It is, therefore, declared that in the public interest it is necessary and advisable to permit the establishment of groundwater management districts (See K.S.A. 82a-1021 for definitions).

Legislative objectives for forming GMDs:

1. Proper management of the groundwater resources of the state;
2. Conservation of groundwater resources;
3. Prevention of economic deterioration;
4. Associated endeavors within the state of Kansas through the stabilization of agriculture;
5. To secure for Kansas the benefit of its fertile soils and favorable location with respect to national and world markets

Purposes for which GMD3 was organized in 1976:

1. To organize and develop the efforts of the entire Groundwater Management District for the proper management and conservation of its groundwater resources;
2. Provide local input into the use and management of groundwater;
3. Provide for the greatest total social and economic benefits from the development, use and management of groundwater;
4. Support research and education concerning proper water management;
5. Work cooperatively with all federal, state, and local units of government to accomplish the objectives of the district and the Groundwater Management District Act and amendments thereto.

Guiding Principles of the District:

1. Represent all District eligible voters for groundwater management purposes.
2. Promote a culture of conservation.
3. Protect and enhance access to safe and usable water.
4. Pursue the highest value for the groundwater consumed.
5. Develop data and information needed to support prudent water management decisions.
6. Target management programs to meet local water needs for today and in the future.
7. All water rights in the District are real property owned by eligible voters and are to be justly represented and administered.

Management Program Document Policy Statements:

1. Water Supply - Conserve present water use benefits and grow the future District usable water supply for the health, safety and welfare of all citizens.
2. Aquifer supply dedication to existing real property rights - Aquifers closed to new water rights at the request of the District are considered fully and completely dedicated to existing real property rights of eligible voters, except for domestic use.
3. Drinking water - Safe drinking water is a fundamental necessity of every person.
4. Donations to Future Supply - An acre foot of groundwater available from a declining aquifer source that is physically and lawfully divertible from an existing operable well for beneficial use has a present conservation value to the future District supply that may be donated by an eligible voter.

Commented [BD6]: Consider moving the entire section to one or more policy documents.

Commented [BD7]: What does this mean? We are not sure we agree. E.g term and temporary permits should still be allowed in some cases w/o offsets.

Commented [BD8]: Donated to what?

Commented [BC9]: Recommend this goes to a policy document too

5. Communications - Good communications between GMD3 and diverse local, state and federal interests, institutions and authorities are necessary for good groundwater management partnerships.
6. Mutual Benefits and Good Will - Encourage all water users and land owners to make decisions, agreements or stipulations affecting their real property water rights that promote mutual benefits and goodwill in the use and conservation of the groundwater supply in the District for a reasonable future period of time.
7. **State Administrative Reviews** - Any state administrative review of an application or request for an order that may affect the status quo groundwater supply to a well owned by any District eligible voter should identify and disclose to the owner the following information: the area water supply; safe yield and recharge rate; the priority of existing rights to the supply; and what may be needed to satisfy prior rights to that supply over a given future period of time.
8. **Board Intervention** - The Board may seek to intervene on behalf of all eligible voters if any process fails, or threatens to fail, to adequately implement the District groundwater management program and policies in the public interest.
9. Groundwater management operations - Management program operations and policy implementation shall be based upon the best models, data and information available.

Commented [BD10]: Not appropriate for MP. Put in policy statement or let's discuss separately what information you need from us.

Commented [BD11]: Unclear. Policy document

Management Considerations for District Aquifers as GMD3 Water Supply Infrastructure.

Commented [BD12]: We would prefer this to go in a policy document. But may be o if f clearly written as the Board's considerations for its recommendations and waivers.

As water resources within GMD3 continue to decline, the pressure on water users to seek waivers of the management program standards will increase. The Board of GMD3 will apply the following considerations in their deliberations, including recommendations to officials, members and the public concerning the governance/management of aquifers, groundwater supply augmentation and aquifer pore space infrastructure as necessary to manage the groundwater resources within the District.

1. Drinking Water Goal

It is in the public interest to ensure that quality drinking water is available for people and animals. No change to a water right should occur if it will create an unreasonable or unreliable drinking water supply, including deteriorating drinking water quality (Water Usability Depletion) to unsafe levels.

2. Maximum Allowable Rate of Consumption

For evaluation purposes, the maximum allowable rate of consumption of the aquifer supply shall not exceed 40% in 25 years to manage excessive aquifer depletion in the public interest.

Commented [BD13]: The 40/25 criteria has only been used to define areas that are fully appropriated. That is not necessarily that same as this states. Is this a new consideration?

3. Culture of Conservation

Any activity promoting present water use efficiency and usable water saved in storage for future supply should receive due consideration for contributing to the GMD3 management program in the public interest.

Planned conservation activity may be established in unique groundwater management (GMA) areas, including and not limited to: Intensive Groundwater Use Control Areas (IGUCA's), Groundwater Quality Management Areas (GQMA's), Local Enhanced Management Areas (LEMA's), and Water Conservation Areas (WCA's).

Commented [BC14]: Are there really GMAs and GQMA's?

4. Groundwater Conservation Reports

Water right owners or water users with demonstrated water conservation activities or agreements may voluntarily report their annual water conservation in a manner similar to state water use reports and receive due consideration for contributing to the GMD3 management program in the public interest.

Commented [BC15]: How will this be demonstrated and who will evaluate?

5. Water Right Priority Contribution

Senior water rights should be recognized for withholding priority calls for groundwater against other users in a local source of supply as contributing to the purposes of the GMD3 management program in the public interest.

Commented [BC16]: What does this mean?

6. Water Right Compliance

Compliance with the terms, limitations and conditions of a water right requires effort. Water right owners with no water right violation sanctions should be recognized for contributing to the GMD3 management program in the public interest.

7. Economic Use Value

Managing water as an economic good is an important way of achieving efficient equitable groundwater use and encouraging conservation and protection of water resources. A proposal that adds resource responsible net use value should be recognized for contributing to the GMD3 management program in the public interest.

Commented [BC17]: What does this mean? There isn't any new water, so this is about moving water around or changing to higher use? Does the proposal automatically get more favorable consideration from the board?

8. Supply Development

Proposals to conserve High Plains Aquifer water by seeking and/or managing an economically and technologically feasible ~~lesser poorer~~-quality source or to import an alternative source, should be recognized as contributing to the GMD3 management program in the public interest.

9. Supply Estimate Improvement

Additional detailed aquifer information that improves groundwater supply knowledge or availability can be recognized and credited as contributing to the GMD3 management program in the public interest.

10. Imported Water Supply

Water demand within GMD3 far exceeds long-term water availability. It is therefore in the public interest to pursue additional sources of water as part of the long-term economic strategy for the region and the country. The US Army Corps of Engineers and the Kansas Water Office in 2015 updated a transfer study from 1982 with financial assistance from GMD3 to investigate the feasibility of transferring water from the Missouri River to western Kansas. GMD3 is also working with partners to evaluate opportunities to study the feasibility of interstate compact authorized water transfers from southeast Kansas sub-basins of water otherwise lost to Kansas beneficial use. Work is also occurring to form multi-state study partnerships to investigate transfer of Mississippi River water to the western United States across GMD3 for future flood protection and supply benefits in the public interest.

Commented [BC18]: Recommend moving this to policy document or position statement. Seems better to reference a policy or position statement after the first part of this section.

11. Aquifer Model Improvements.

The most recent aquifer modeling effort of the District was a two-phase study to determine economic and hydrologic aquifer characteristics. The first phase of the study produced the reports "Ground-Water Model for Southwest Kansas Groundwater Management District No. 3" and "Ground-Water Model for Southwest Kansas Groundwater Management District No. 3: Future Scenarios." These reports show model results for remaining aquifer water and usable life estimates based upon aquifer characteristics and provide guidance as to how the aquifer will respond based upon various pumping scenarios. The second phase of the study produced the report "Potential economic impacts of water-use changes in Southwest Kansas." This study considered three policy scenarios aimed at reducing groundwater consumption in three different areas within GMD3. This information is based on data over 10 years old. A set of model updates and tools with greater utility for District member use in achieving Management program purposes is needed.

12. Aquifer Interstate Management.

GMD3 has initiated an AIM initiative in provided letters of invitation to state officials in both Kansas and sister states to encourage interstate discussion of interstate aquifer equitable use and consumption policies and programs now that the leadership of GMD3 has been demonstrated in closing the District to additional development in the public interest.

Commented [BD19]: How does this relate to the section's topic? Our experience says that groundwater management of other states bears limited effect on own groundwater resources (it can effect to surface water entering our states).

Commented [BC20R19]: Move this to policy/position statement document.

ORGANIZATIONAL HISTORY OF THE DISTRICT

A series of informational meetings were sponsored by the Southwest Kansas Irrigation Association in the fall of 1973 to determine the will of the people relative to the formation of a local groundwater management district, also commonly referred to as a GMD. As a result of these meetings a steering committee was formed to carry out the organization of the District according to procedures provided in the GMD Act. On December 4, 1974, the steering committee filed a declaration of intent, along with a map of the proposed District, with the Chief Engineer of the Division of Water Resources (DWR), Kansas State Board of Agriculture. The Chief Engineer consulted with the steering committee, conducted appropriate geological studies and reviewed input from people in the fringe areas of the District. On August 25, 1975, the Chief Engineer certified the description of the lands proposed to be included in this new taxing subdivision of the State.

Next, the steering committee circulated a petition throughout the proposed area. After receiving the proper number of signatures it was submitted to the Secretary of State for approval. The petition was approved on October 13, 1975 and was followed by an election that was held on February 24, 1976. The election resulted in 1,155 voters in favor and 230 opposed. The Secretary of State was compelled by the election results to issue a Certificate of Incorporation on March 23, 1976. The Certificate of Incorporation has been filed at each county's Register of Deeds Office that is located within the District. An organizational meeting to elect the initial Board of Directors was held in Garden City, Kansas on April 6, 1976. The second Annual Meeting was held March 23, 1977 and now all annual meetings are held on the second Wednesday of March unless appropriately changes with notice.

The GMD3 is governed by a 15-member Board of Directors that is elected by a general constituency of the qualified voters present at an annual meeting. Each county is represented by at least one director who resides in that county. Any type of "water user", as defined in K.S.A. 82a-1021(k), may be elected to serve as one of the 12 county positions. In addition to the 12 individual county positions, there are also 3 "at-large" board positions that are designated to represent only a single type of water usage. These "at-large" water use types include Municipal, Surface water, and Industrial water use. The GMD3 is financed by an annual land assessment and groundwater user fee that is levied against local landowners and water users. This is accomplished through an annual budgeting process that includes a review of the GMD3 financial status and draft proposed budget for the ensuing year at the annual meeting and at a public hearing of the proposed budget to finance the Management Program activities and level of assessments to finance the budget (usually in July).

The GMD3 office is located in Garden City, Kansas. The GMD3 Board conducts its regular monthly business meetings on the second Wednesday of each month (unless changed for cause) and provides an Annual Meeting for the election of Board Members on the second Wednesday during the month of March. Public hearings are regularly provided to allow public input on the budget, management programs, and other pertinent activities. A detailed set of bylaws has been adopted by the board and are regularly reviewed and updated. Each year members of the Board

are appointed to serve on at least one sub-committee. Each committee addresses issues on an as-needed or ad hoc basis as directed by the Board. The committees are as follows: Executive, Policy and Legal, Finance, Research and Development, Renewable Supplies, and the Annual Meeting committee. In addition, other ad hoc or grant driven advisory committees may be formed and operated as needed to administer grants or develop local water conservation and economic strategies. One example is the Arkansas River Litigation Funds Advisory Committee, which advises the GMD3 on expenditures from a Western Water Conservation Projects Fund grant from the legislature and the Kansas Water Office, with annual reports to the state legislature.

CHARACTERISTICS OF THE DISTRICT

General Characteristics of the District

The District includes approximately 5,393,229 acres, or approximately 8,425 square miles of land. This includes all of Morton, Stevens, Seward, Stanton, Grant, Haskell, Gray, and Ford Counties as well as parts of Meade, Finney, Kearny, and Hamilton Counties. Land surface elevations range from approximately 3500 feet above sea level (ASL) in the west to less than 2300 feet ASL in the east. The land surface slopes in an east-southeast direction at a gradient ranging from 5 to 20 feet per mile.

There are approximately 12,405 established water rights within the District, comprising approximately 30 percent of all Kansas water rights. They authorize approximately 10,500 non-domestic water wells (Figure 1 – Water Rights Map). The most common source of water for these wells is the High Plains Aquifer, which includes the Ogallala Formation, and is an unconsolidated, unconfined aquifer that receives very little recharge. In comparison, approximately only 75 wells are authorized to tap into the confined Dakota Aquifer System, which is commonly referred to as the “Dakota Aquifer” (See also K.A.R. 5-1-1. Definitions). The characteristics of these aquifers can vary dramatically throughout the District.

The quality of the groundwater in the High Plains and Dakota Aquifers is generally fresh although in some locations the salinity and/or uranium exceeds recommended limits or maximum contaminant levels (MCLs) for drinking water established by the US Environmental Protection Agency (EPA). The saturated thickness of the High Plains Aquifer ranges from 20 feet to 600 feet within the District. Well capacities range from 20 gallons per minute (gpm) to 3,000 gpm. Historic depletion also varies spatially across the District as documented in the Kansas Geological Survey (KGS) High Plains Aquifer Atlas. A 2010 model of the District indicated that groundwater pumping caused a nearly 30% decrease in aquifer storage from pre-development to 2007, for an average decline of roughly 70 feet. These groundwater declines have created a loss in the groundwater discharging to streams, resulting in lower stream flows (2014 Kansas Water Plan).

There are two river systems that interact with their respective alluvial aquifers and the Ogallala Aquifer, the Arkansas River and the Cimarron River. The Arkansas and Cimarron Rivers are losing streams within the District, meaning that when the rivers are flowing some of the flow is

lost to the underlying aquifer through gravity induced percolation. There are six surface water irrigation ditch systems that have historically diverted water from the Arkansas River between the Colorado-Kansas state line and Garden City. Collectively, these irrigation ditch companies owned by farmer-shareholders control approximately 140,000 acre-feet of surface water rights from the available Arkansas River flows. Portions of the headwater of tributaries of the Pawnee River are located in eastern Finney, northeastern Gray, and northern Ford Counties of the District. The alluvial aquifers of these headwaters contain some water locally, but are too small to be a significant water source for the District.

Both the Arkansas River and the Cimarron (including Crooked Creek) river systems are associated with interstate compact agreements that are both state and federal law. The 1949 Colorado and Kansas Arkansas River Compact relates to the waters of the Arkansas River drainage basin primarily above Garden City and is administered by an interstate administrative agency called the Colorado-Kansas Arkansas River Compact Administration (ARCA). Their website can be found at:

<http://www.co-ks-arkansasrivercompactadmin.org/resources.html>

The 1966 Kansas and Oklahoma Arkansas River Compact apportions water between the two states as allowed conservation storage or water transfer amounts divided into six major topographic sub-basins tributary to the Arkansas River basin in Oklahoma that span the entire southern border of Kansas. The Cimarron River sub-basin directly relates to the District as an upstream area. The Kansas – Oklahoma Arkansas River Commission is the interstate administrative agency that operates that compact, and additional information can be found at: <https://agriculture.ks.gov/divisions-programs/dwr/interstate-rivers-and-compacts/kansas-oklahoma-arkansas-river-compact>.

Corn is the most popular irrigated crop according to annual water use reports collected by the DWR. The Net Irrigation Requirement (NIR) for corn ranges from 13.7” in Ford County to 15.4” in Morton County; this is in addition to the average precipitation of only 19 inches (K.A.R. 5-5-12, Net Irrigation requirements at 50% chance of rainfall; K.A.R. 5-6-12, Average annual precipitation). Corn is the first irrigated crop in the District to be provided a limited irrigation risk management option in the federal crop insurance program of USDA Risk management Association

Ogallala/High Plains Aquifer Characteristics

The Ogallala/High Plains Aquifer consists mainly of a heterogeneous assortment of sand, gravel, silt, and clay of Tertiary and Quaternary age that was deposited by streams that flowed eastward from the Rocky Mountains. The aquifer sediments overlie an eroded bedrock surface of Permian and Cretaceous age. The Tertiary Ogallala Formation makes up the main part of the aquifer in western Kansas. Because of the similarity in composition, the Tertiary sediments are difficult to distinguish from the younger Quaternary sediments. The aquifer varies widely in type of material, thickness, and layer continuity. Individual beds generally are not continuous and within short distances may grade laterally or vertically into material of different composition. Hydraulic conductivity and specific yield depend on sediment types, and vary widely both vertically and

laterally. Some layers are cemented and are referred to as mortar beds and caliche. Although the aquifer is generally unconfined, confined and semi-confined conditions may occur locally. Thick clays are present in the deeper portion of the aquifer in Seward and Meade counties.

The thickness of the unconsolidated sediments varies greatly due mostly to the uneven bedrock surface. Saturated thickness ranges more than 300 feet as illustrated in the Kansas High Plains Aquifer Atlas (Kansas Geological Survey 2016). The areas of greatest thickness are found in the southern portions of Stevens, Seward, and Meade Counties.

Regional groundwater flow is generally from west to east at an average rate of about 1 foot per day or less. Though locally in some areas, a higher rate of groundwater flow can be estimated. Recent water table maps can be found in the Kansas Geological Survey High Plains Aquifer Atlas, at: http://www.kgs.ku.edu/HighPlains/HPA_Atlas/. Depth to water is variable and exceeds 350 feet in a large portion of Haskell County and in portions of Grant and Stanton counties.

In some areas, such as the Arkansas and Cimarron River corridors, the High Plains Aquifer is hydraulically connected to overlying alluvium. In the case of the Arkansas River corridor, the alluvium is differentiated from the Ogallala/High Plains Aquifer on the basis of the greater permeability of the alluvium and an underlying lower permeability zone, which results in differences in water levels between the aquifers. The Ogallala/High Plains Aquifer is also connected to the underlying Lower Cretaceous Dakota Aquifer in some locations.

Bedrock Aquifer Characteristics

The Dakota Bedrock Aquifer system is comprised of Sandstones and shale that typically yield much smaller amounts than the yield of wells in the High Plains Aquifer. The Dakota Aquifer underlies and is in hydraulic connection with the High Plains Aquifer in much of the southern part of GMD3. Additional Dakota Aquifer information can be found at: <http://www.kgs.ku.edu/Dakota/vol3/ofr961a/man02.htm>).

In the northern part of the District, low permeability shale and chalk overlie and hydraulically isolate the Dakota Aquifer from the overlying High Plains Aquifer. Some wells in northern Finney County may be completed in geologic voids in the Niobrara Chalk formation and are referred to as crack wells that typically produce a good amount of water until the crack or void is dewatered. For additional geologic information on groundwater formations above the Dakota, see: <http://www.kgs.ku.edu/Dakota/vol3/ofr961a/man03.htm>

The management program must recognize the change from good hydraulic connection to isolation for a water rights source of groundwater supply to be preserved by rule standards that have been adopted for this purpose. Cretaceous age formations may be absent in the southernmost part of the District where Permian bedrock formations directly underlie the High Plains Aquifer. For additional information, see: http://www.kgs.ku.edu/Publications/Bulletins/IRR8/05_deve.html

The deeper Upper Permian red bed formations may contain sandstones and some usable groundwater locally, and may have water quality concerns that require careful monitoring to

prevent water usability depletion of fresher supplies. They have not typically provide a usable source for irrigation in the District except in locations where the High Plains Aquifer is thinly saturated, such as in portions of Morton and Stanton Counties.

Further investigation of the potential uses of Permian age aquifer water for irrigation can be expensive, and some deep test and completion of deep wells for irrigation have occurred as shallower sources become depleted and oil and gas production tests indicate deeper water sources with lesser or presently unusable water quality are available. Efforts to evaluate the reliability and feasibility of these potential sources together with newer technologies to treat poor quality water from marginal sources to usable standards should occur.

Kansas regulations require the petroleum industry to protect fresh and usable aquifers from contamination by establishing minimum depths for surface casing in an oil or gas borehole. The surface casing is a pipe that is inserted into the borehole being drilled during oil or gas exploration and sealed by injecting cement under pressure to fill the space between the casing and the borehole. The primary function of the surface casing in the petroleum industry is to prevent saltwater from entering a usable aquifer from lower zones intersected by the borehole. But concern can also exist when old wells established when surface casing depths were short or not fully cemented in from top to bottom may allow usable water from an upper formation to flow uncontrolled to a deeper unusable formation.

Precipitation and Recharge

The climate of Southwestern Kansas is semiarid, characterized by moderate precipitation, low humidity and high evaporation. Annual precipitation increases to the east and typically ranges from 16 to 24 inches. Most of the precipitation falls during the growing season, April through September.

Potential sources of recharge to the aquifer include precipitation, surface water (including the Arkansas and Cimarron Rivers and irrigation ditches), return flow from irrigation, lateral groundwater flow, and flow from adjacent aquifers. Recharge generally increases with increased precipitation, but is affected by soil properties, land cover and land use. Regional areal recharge estimates are low, typically less than about one inch annually. Recharge may be higher locally, such as beneath river and ditch corridors, irrigated land, and sand dunes.

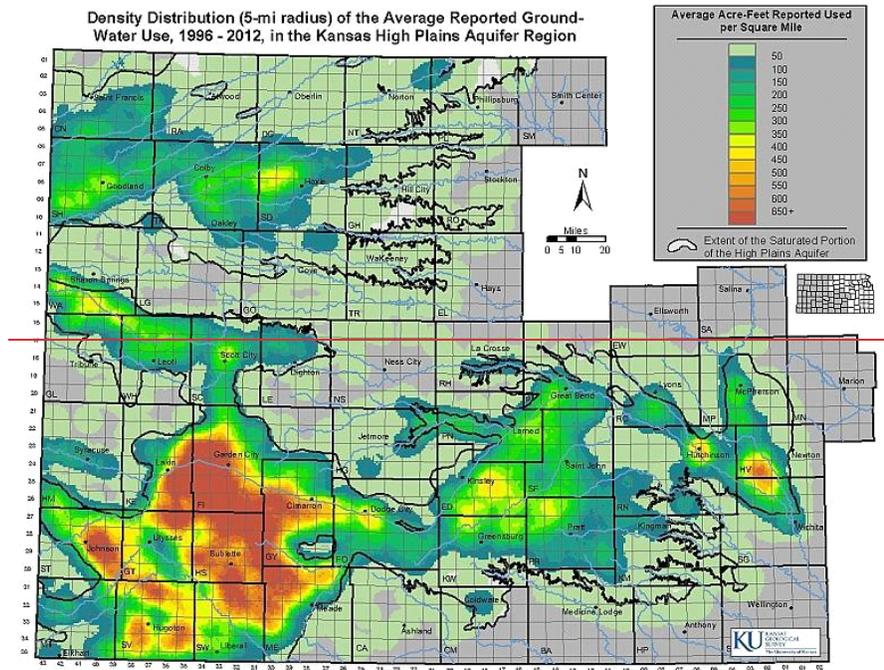
Water Use and Water Level/Saturated Thickness Declines

GMD3 is the highest-intensity water use area in Kansas. This water use, combined with low recharge from rainfall, has created large declines in water storage, but the Ogallala Aquifer is still a highly productive water resource for the people within the District. The following maps display the pumping density distribution, the percent loss in saturated thickness, and the remaining saturated thickness of the High Plains Aquifer in Kansas. The most recent GMD3 groundwater model information can be found at the following urls:

Ground-Water Model for Southwest Kansas Groundwater Management District No. 3:
http://www.kgs.ku.edu/Hydro/Publications/2010/OFR10_18/

Ground-Water Model for Southwest Kansas Groundwater Management District No. 3: Future Scenarios: http://www.kgs.ku.edu/Hydro/Publications/2012/OFR12_3/

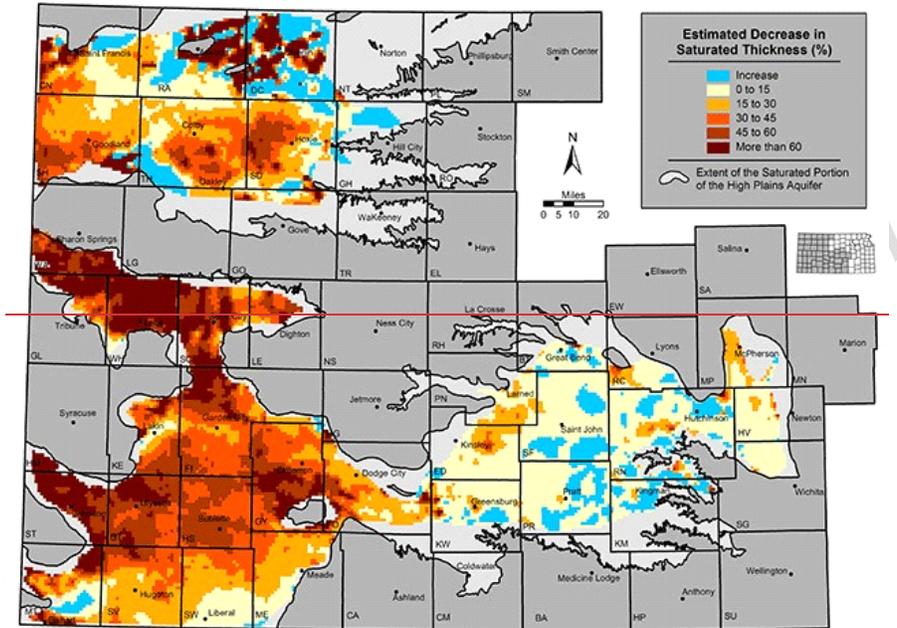
Potential economic impacts of water-use changes in Southwest Kansas: <http://www.tandfonline.com/doi/abs/10.1080/19390459.2013.811855>



Pumping Density of the High Plains Aquifer in Kansas.

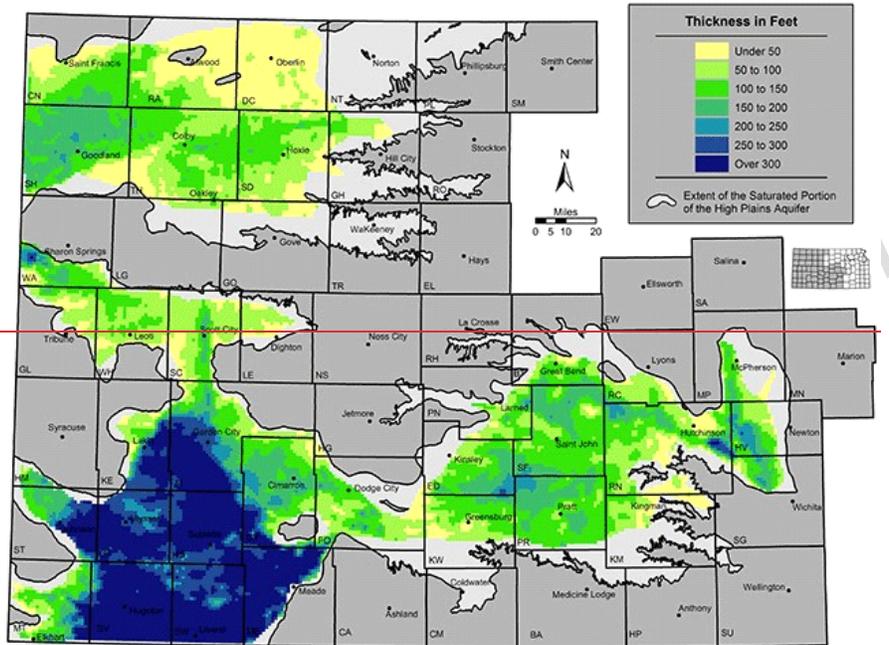
Source: Kansas Geological Survey,

http://www.kgs.ku.edu/HighPlains/HPA_Atlas/Water%20Rights%20and%20Water%20Use/index.html



Percent Decline in Overall storage of the High Plains Aquifer in Kansas.

Source: Kansas Geological Survey, <http://www.kgs.ku.edu/Publications/pic18/index.html>



Saturated Thickness of the High Plains Aquifer in Kansas.
 Source: <http://www.kgs.ku.edu/Publications/pic18/index.html>

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WATER SUPPLY PROBLEMS & SOLUTIONS

Problem 1: Threatened Water-Based Economy

Kansas relies heavily on agriculture-based water use within GMD3 to sustain the economy. The development of the Ogallala Aquifer has secured a reliable supply of food, fuel, and fiber for world markets. Local irrigated grain and food supplies, combined with an arid climate, have made southwest Kansas an attractive location for livestock and dairies. Many industries are located within GMD3 in order to remain in close proximity to the intensified reliability that irrigation agriculture provides. This has allowed the economy to grow tremendously over the past 60 years. All of this economy is dependent upon having a reliable water supply. Declines in the Ogallala Aquifer threaten the economic future of the people and interests within the District. A 2013 report to the governors economic advisory board by the Kansas Department of Agriculture said that transitioning western Kansas irrigated land to dry land costs the local economy nearly \$4000/acre/year. Eliminating aquifer depletion could force the transition of about 90% of irrigated acres to dry land. This economic loss would not be in the public interest.

In the 50th future year from 2013, the expected annual economic loss to the Kansas economy due to insufficient water supply may be \$18.3 billion, expressed in 2015 dollars. \$10 billion of this will be from the District. This is 10.1% less than it would be with sufficient future water supply. There will be 241,000 fewer jobs than would otherwise be available (James 2015). For these reasons, GMD3 has taken measures to extend the useful life of the Ogallala Aquifer while protecting the property rights to use water. See appendix ___ for report graphic.

Historically, the program for Ogallala Aquifer water in GMD3 has been controlled declines to manage a shared access to groundwater and economic growth. The Chief Engineer of the Kansas Department of Agriculture, Division of Water Resources (Chief Engineer) is statutorily required to make the waters of Kansas available to the people of Kansas, and that policy allowed the Ogallala Aquifer to be quickly appropriated well beyond the point of sustainability. The Kansas GMD Act was passed in 1972 to establish the right and process for local water users to determine their destiny regarding water use and supply management through action enabled under the Act and consistent with state law.

~~The Chief Engineer does not assess the long term availability of the water supply in evaluating new groundwater use applications or water right changes, preferring to rely on real time supply availability estimates.~~ GMD3 initiated management activity and adopted a revised management program on July 12, 1978 implementing an allowable appropriation limit on depletion rates of 40% in 25 years.

The GMD3 Board of Directors has adopted a minimum conservation goal of reducing the rate of decline of the aquifer by one percent per year. Achieving this goal would result in an overall reduction in annual decline by 22% in 25 years. This would achieve a 63% reduction in the current rate of decline in 100 years.

GMD3 has taken several actions to protect development since being incorporated. Minimum distances between water wells have been established within the District. These are more

Commented [BD21]: Some of this narrative seems more appropriate for a policy document. The noted transition to dryland will occur over decades. No one is suggesting "eliminating aquifer depletion." "May be" economic not all that useful here.

Commented [HK22]: When and where was this goal established? What does this mean? How would it be applied, by county, township? What will it take to achieve this goal?

restrictive than spacing regulations outside the district. In addition, the entire portion of the High Plains Aquifer within the district has been closed to new appropriation.

Commented [23]: Should the District review spacing requirement in light of increasing concerns.

GMD3 will continue to supported or take the lead on water conservation initiatives in coordination with State and Federal resources. Recent examples include:

Conservation Reserve Enhancement Program (CREP) working with many partners to retire water rights and transitions irrigated agriculture on soils unsuitable for dryland farming to native grassland,

Agricultural Water Enhancement Program (AWEP) with USDA to transition irrigated acres to dryland agriculture,

Regional Conservation Partnership Program (RCPP) with USDA which incentivizes adoption of advanced irrigation water management through telemetry technology, remote soil moisture and flowmeter monitoring,

Conservation Innovation Grant (CIG) program with USDA that evaluates mobile drip irrigation with the goal of getting it listed for federal subsidies,

System Optimization Review (SOR) with DOI-BOR (Reclamation), which evaluated the irrigation ditch systems along the Arkansas River corridor for potential efficiency improvements,

Local Enhanced Water Management (LEMA) discussions to develop local mandatory groundwater conservation strategies in various areas of the District.

Water Conservation Area (WCA) considerations to assist members developing reasonable conservation plans in line with the management program for consent agreement with the Chief Engineer.

Upper Arkansas River Public Water Supply Alternatives Viability Analysis (WSA) with Reclamation to determine preferred projects for assuring area public water supply.

Planning Assistance to States (PAS) with US Army Corps of Engineers and Kansas Water Office to update a 1982 Six State High Plains Aquifer Study water transfer element to have a recent example of a Kansas Aqueduct project to explore others.

Historically, GMD3 conducted water availability calculations and informed the Chief Engineer. The Chief Engineer relied on the GMD3 calculations to grant or deny new water rights. Guided by the GMD3 management program and board action, standards for acceptable development and depletion rates were determined in the High Plains Aquifer. This includes the recent actions to close the High Plains Aquifer to new water rights in GMD3. It is important that any implementation of conservation programs and new access liberties to maximize groundwater utilization occur under consistently applied rules and criteria to avoid ~~arbitrary and capricious~~ agency ~~deals~~actions that may not be consistent with the management program for the District.

Commented [BD24]: Remove; put in policy document. We believe we are implementing such programs insure flexibility will not create a problem.

Goals for Problem 1: Threatened Water-Based Economy

1. Identify and designate high priority areas within the GMD and dialogue with members within these areas regarding additional management they wish to explore and best means to accomplish.
2. Identify water use values and trends, as well as the value of water conserved.
3. Promote water use efficiency through new technology implementation.
4. Promote a culture of conservation.
5. Collaborate with local producers who wish to better manage their water supplies.
6. Promote new water importation projects as practical.
7. Promote projects that provide economic benefit with less water use.
8. Seek outside partnerships to create programs within GMD3 to reduce water use.
9. Improve the quality of data at the project level for better water management decisions.
10. Reduce the rate of water level decline a minimum of 1% per year.
11. Develop water imports.

Commented [BD25]: In regard to the goals...we suggest more specifics, esp. on these goals. The major purpose of the MP is to set out the GMD's program for dealing with water management problems.

How will the GMD promote water use efficiency. How about cost-share on soil moisture probes?

What will the GMD do to "promote a culture of conservation"? How about an educational program that help water users understand the negative consequence to their long-term economic well-being and the Region's due to low-value pumping.

What data quality improvements are you suggesting?

How will the rate of water level decline be measured? What actions to reduce?

Commented [BD26]: As we discussed 5/1; it seems the later approach (dialogue with members on use of new tools may be more fruitful than HPA designations).

Problem 2: Improve On-Site Water Management

On-site water management begins with preventing the waste of water. Soon after becoming incorporated, GMD3 has been the primary agency responsible for curtailing waste of water violations. A corrective course of action is normally and consistently established on the same day a waste of water complaint is received. Aside from establishing a quick-response attitude towards curtailing waste of water and other water right violations, GMD3 has assisted implementing state mandated water conservation plans and memorandums of understanding (MOU) to ensure that producers can increase irrigated acreage without increasing water use. GMD3 also became the first groundwater management entity located in Kansas to mandate the installation of permanent flow meters on non-domestic wells. The program began in 1991 and became effective in 1993. The program became fully implemented with meter installation reports confirmed by 1996. Sensing a need for increased enforcement of the flow meter requirement, the Board of Directors increased the flow meter inspections by over 200% during 2002 without increasing assessments.

Flowmeter verification test data gathered by GMD3 indicate installed water flowmeters on average over record actual groundwater diversions by a percent or so. On-site results can vary significantly depending on many hydraulic and meter maintenance variables. Also, new technologies for in-field sensors and remote data access are providing significant improvements to on-site water management.

Commented [BD27]: It would be more accurate to note this as a shared responsibility with DWR.

Goals for Problem 2: Improve On-Site Water Management

1. Visit and perform an inspection of 25% of all non-domestic flowmeter sites and/or wells within GMD3 each year.
2. Perform flow verification tests.
3. Collect water level and water quality measurements.
4. Provide professional support resources and information.
5. Promote on-site technology implementation.

Commented [28]: Inspections should be more than just an inventory but include a compliance check with follow-up.

Problem 3: Water Right Impairment

The difficulties of non-renewable groundwater administration and management is inherent in Kansas history. From the first attempt to clarify a consistent use right doctrine in 1945 through the provision for water rights as changeable real property that must tolerate reasonable economic effects between use rights in 1956, the dedication of local groundwater management rights in 1972, and the legislative restriction of no use without first obtaining state permission in 1978, all of the benefits and effects of developing beneficial use of the vast High Plains Aquifer have been shared by all.

Commented [BD29]: There is much in this section that represents the GMDs view of the issue; move such to a policy statement.

It is well accepted that the KWAA endowed the Chief Engineer with certain statutory authority over the waters of Kansas to grant, protect, and administer water rights according to the doctrine of prior appropriation. The KWAA placed the Chief Engineer under a statutory duty to grant applications for water rights, provided that the water is available for appropriation beyond what is needed to satisfy earlier rights. Those water rights receive the protections of the chief engineer in accordance with a modified prior appropriation doctrine and impairment complaints.

Commented [HK30]:
What does this mean?

As the regional water table continues to decline, many users within GMD3 will lose the ability to exercise their water rights to their fullest and may seek administrative or judicial remedy if they believe their water rights are being impaired. GMD3 and DWR have set rules and regulations to reduce the likelihood of well-to-well interaction and impairment. K.A.R. 5-23-3 sets minimum spacing requirements based upon authorized water use. There are many wells that do not meet spacing requirements because they were in place before the GMD3 requested K.A.R. 5-23-3. The rule also allows producers to move their well to areas that do not meet spacing as long as they are improving spacing or are within 300 ft of present location. In order to limit well-to-well interaction, the exemption allowing for moves less than 300 ft should occur only if spacing is met or improved under the rules. Rules in a declining aquifer should not trump reality for agreeable operating relationships with neighboring prior well owners.

Commented [HK31]:
Is this a rule you wish to seek? If so, state it in the goals.

Each change application review for permission faces a requirement in the law for evaluating any impairment potential of other water rights. The present change application impairment evaluations look principally at the effect of the change on nearby wells. of the Chief Engineer accept the decline of groundwater supply in GMD3 and therefore include an implicit acceptance of the inevitable lack of a future groundwater supply.

Commented [BD32]: What does this mean? It seems to be a policy statement.

The routine change application impairment review in a declining aquifer occurs under three tenets:

Commented [HK33]:
While this latter part of the sentence is generally true, when the aquifer depletion is severe enough, it is not accepted and the change is denied.

- 1) Rules and stakeholder notice (or GMD3 board review and waiver recommendation) is generally considered sufficient demonstration that no impairment will occur; and
- 2) Water right consumption use must not be increased inflated when a water right is changed; ~~and,~~
- 3) ~~Any aquifer decline rates are accepted. This is a tenet of acceptance that impairment from aquifer decline either:~~
 - a. ~~Must be one of the natural conditions to which all are subject without compensation, regardless of date of appropriation, or~~
 - b. ~~Must be dependent upon legislative or administrative determination of reasonable conditions in terms of rate of depletion and water quality.~~

~~In a constantly declining aquifer, this amounts to a determination that the declines are reasonable and the prospects for the complete loss of the supply is accepted regarding prior rights to future supply.~~ Historically for the High Plains Aquifer, the maximum acceptable rate of depletion standard in GMD3 has been the 40/25 rule.

Any state administrative review of an application or request for an order that may adversely affect the status quo groundwater supply to a well owned by any District eligible voter should identify and disclose to the owner the following information: the area water supply; safe yield and recharge rate; the priority of existing rights to the supply; and what may be needed to satisfy prior rights to that supply over a given future period of time.

Goals for Problem 3: Water Right Impairment

1. Establish criteria to ensure that water right changes or new liberties to divert water will result in satisfied owners of prior water rights now and for a reasonable future time. For example, a 25 year planning time.
2. Limit water use rule waivers for new changes to areas that would not decline in the local source of supply by more than 40% in 25 years (40/25 rule) without prior right stipulated agreements.
3. Ensure that all neighboring water right holders are notified of each proposed change to local water use liberties and promote opportunity for members to express concerns or provide any needed stipulations that assure satisfied prior rights and consistency with the management program.

Problem 4: Upper Arkansas River Corridor Water Management Efficiencies.

As a result of litigation filed in the United States Supreme Court (*Kansas v. Colorado, No. 105 Original*), the State of Kansas received more than \$34.7 million in damage award from the State of Colorado for actual Kansas losses to crops and fields in Southwest Kansas, including interest. The cash damage award was quantified from the effects for certain Colorado violations of the

Commented [HK34]:
See above

Commented [BD35]: This standard has been for decisions on applications; it is not a standard on water right impairment. Put in policy statement.

Commented [BD36]: This appears to be a repeat of a statement above. It should not be in the MP. We are willing to discuss what information is required by you.

Commented [BD37]: Unclear. Policy statement?

Arkansas River Compact (Compact, K.S.A. 82a-520). The cash damages paid back the state litigation cost, with the remainder going 1/3rd to the Kansas Water Plan and 2/3rds to the actual affected area in southwest Kansas in the form of the Western Water Conservation Projects Fund (WWCPF).

Ultimately, to assure a fraction of the damage funds from Colorado would be available for the intended purposes, the 2008 legislature authorized a grant to be made from the Kansas Water Office to a Southwest Kansas Groundwater Management District No. 3 special fund through a grant agreement. Projects funded in whole or in part by the WWCPF must be in the area impacted by the Arkansas River Compact and meet eligibility requirements and goals in K.S.A. 82a-1803 and Senate Bill 534. Under the provisions of SB 534 and the KWO Grant Agreement, the Arkansas River Litigation Fund Committee established in 2005 became the advisory committee to the GMD3 board, who in turn manages the funds, approves projects and expenditures, and makes requests to the Director of the Kansas Water Office for approval as consistent with grant purposes, in consultation with the Chief Engineer, KDA/DWR.

Goals for Problem 4: Upper Arkansas River Corridor Water Management

- ~~1. Maximize general public good from available river flows (public interest).~~
- ~~2. Maximize efficiency of call water for surface water ditch irrigation.~~
- ~~3-1. Investigate methods to maximize benefits of high river flows for aquifer recharge and well augmentation.~~
- ~~4-2. Investigate ways to address water quality problems in surface water and groundwater.~~
- ~~5-3. Reduce consumptive use of water to help stabilize the water delivery system.~~
- ~~6-4. Improve the stability of the hydrologic system for irrigators.~~
- ~~7. Address compact compliance.~~

Commented [BD38]: We don't believe several of these are the GMD's responsibility.

Commented [BD39]: What is this saying? Reduce ET?

Commented [BD40]: What is this saying?

Problem 5: Water Quality in the Arkansas River Basin.

The water entering the state of Kansas in the Arkansas River is high in contaminants, including sulfate salinity and uranium. For example, estimates from the Kansas Geological Survey of the weight of uranium coming into Kansas annually from Colorado via the Arkansas River are significant.

Year	Annual uranium load, metric ton/yr	Annual uranium load, ton/yr	Annual uranium load, lbs/yr
2012	1.80	1.98	3,960
2013	1.61	1.78	3,560
2014	3.77	4.15	8,300
2015	6.01	6.63	13,260
2016	7.26	8.01	16,020

*Kansas Geological Survey Open-File Report No. 2017-2
January 2017*

This water recharges and contaminates the Ogallala Aquifer through infiltration of the river bed and the irrigation ditch service area that utilizes the river water. The saline nature of the water reduces its usability and reduces expected crop yields. It also greatly increases the operation and maintenance cost of irrigation systems due to its corrosiveness. Within GMD3, the cities of Lakin, Deerfield, and Holcomb have experienced a decline in water quality due to infiltration of river water near their city well fields. The City of Lakin recently had to construct a Nano Filtration water treatment facility to get within the Environmental Protection Agency's (EPA) maximum contaminant limit (MCL) for uranium. This cost the community millions of dollars. The water extracted from the Deerfield and Holcomb wellfields has been within safe drinking water standards. However, it has been deteriorating and those cities will have to develop a treatment solution in the future.

GMD3 has worked with the US Department of Interiors Bureau of Reclamation (Reclamation) to develop a study evaluating public water sources in the river basin above Garden City to help plan for the future considering the deteriorating water quality and declining aquifer levels. This study included the cities of Coolidge, Syracuse, Kendall, Lakin, Deerfield, and Holcomb. It identified possible solutions, including construction of new facilities, infrastructure, and possible collaboration efforts, give these cities potential options for the future. GMD3 remains committed to monitoring the river water quality to promote programs and practices that can address the usability of streamflow and adjoining aquifers to assist affected communities and individuals in protecting present supply and planning for future water needs.

Goals for Problem 5: Water Quality in the Arkansas River Basin

1. Develop Standards on water usability and value for various contamination levels.
2. Identify new usable water sources or technologies that can enhance the usability of poor quality sources.
3. Follow up on the work performed with Reclamation in 2012 to develop a drinking water plan for the population along the river corridor.
4. Explore the merits of adding the Hamilton County portion of the river basin into the GMD3 service area.

Problem 6: Water Quality Protection.

Backflow prevention is an essential first step in averting manmade contamination of groundwater. GMD3 required backflow preventers or check-valves as early as 1978. This was part of the first set of rules requested and promulgated for GMD3. Later this regulation was rescinded and replaced by a statewide regulation developed by the Chief Engineer. Inadequate well construction standards can be another leading cause of manmade groundwater contamination. During the late 1970s and early 1980s it became apparent that wells being constructed in alluvial river valleys needed to be built with permanent barriers preventing river water from reaching the lower aquifer. Improperly constructed and/or plugged wells have created conduits allowing river water that is of lesser quality to migrate along the outer wall of the well

casing and invade lower aquifer zones. Similar criteria are required to prevent contact between confined and unconfined aquifers. In addition to those conditions the Permian and lower High Plains Aquifers found in parts of Meade and Seward counties in some areas contain high concentrations of naturally occurring chlorides or other undesirable water constituents. Soon after discovering this concern in the mid-1980s, GMD3 adopted well construction restrictions in a special Groundwater Quality Management Area in parts of both Meade and Seward Counties, as well as rules for testing to limit the movement of the contaminated groundwater into fresh water zones.

Goals for Problem 6: Water Quality Protection

1. Collaborate with the KDHE and Kansas Corporation Commission (KCC) to establish well construction standards that best protect water quality and usability.
2. Collect water quality data and track known water quality issues.
3. Establish water quality management areas and rules as needed to protect water usability.

Problem 7: Exploration of Deep Permian Aquifer Use.

As the value of water increases and local supplies diminish, some water users are losing the ability to access water from the Ogallala Aquifer and are seeking deeper, often poor quality, sources of water to continue their projects. GMD3 has spacing requirements for the Dakota Aquifer. More evaluation and policy development is needed for other deeper aquifers. There is a benefit to accessing this water, but care needs to be taken to ensure that cleaner, more shallow water is not contaminated, that the deeper aquifer consumption does not produce land subsidence, and that it does not cause impairment of property rights. For these reasons, standards need to be developed regarding Permian aquifers.

Goals for Problem 7: Exploration of Deep Permian Aquifer Use

1. Work with water users to identify water quality concerns in any Permian well.
2. Establish spacing and well construction requirements in Permian aquifers.
3. Identify and promote technologies that make poor quality deep water more usable.

Commented [41]: Consider adding: identify the potential means to determine the level of allowable development.

Problem 8: Availability of Energy.

It is critical to have affordable energy available for any project. If energy were to become too costly for irrigation to be feasible, the effect on the local economy would be devastating. Therefore, GMD3 will support and promote private efforts aimed at assuring an adequate supply of affordable energy for pumping and diversion of water rights within the district.

Goals for Problem 8: Availability of Energy

- 1. Support and promote private efforts and agency evaluations aimed at assuring an adequate supply of affordable energy for the people and projects within GMD3.

Problem 9: Promoting a culture of water conservation.

Most water rights within GMD3 were established under the premise that the value of water is in its use and that rights to water should be forfeited if left unused. This so called “use it or lose it” doctrine was changed by the Kansas Legislature in 2012 so that nobody with a water right from an aquifer closed to new appropriation by order of the Chief Engineer would lose that right due to nonuse. However, there are still many examples throughout rules, regulations, statute, and programs where past use creates opportunity and past conservation limits it. Any approach to flexible management should not encourage use over conservation, as that is counter to a culture of conservation. This is an important management principle in the declining Ogallala/High Plains Aquifer.

Many water users wish to have more flexibility in how they can use water rights. Any additional flexibility granted should be expected to result in more water use than status quo. Therefore, any flexibility granted should be accompanied by an appropriate reduction in water allocation. It is inadvisable in a declining aquifer to allow a great deal of new flexibility on a long-term project without agreements or stipulations from neighboring water right owners. This can greatly reduce supply to some wells. It is better to limit flexibility to shorter terms so the effects of water allocation flexibility can be re-evaluated before irreversible supply depletion occurs.

Inefficient past water use should not be rewarded over past conservation. Conservation programs within GMD3 should not rely on past use as the sole factor for determining future water use budgets for individual wells or conservation program eligibility. Changes to operational practices should be identified to ensure that conservation will take place. Programs that set allowable quantities for flexibility or water savings should give due consideration to past conservation. GMD3 should avoid rewarding inefficiencies, and should be based upon reducing the amount of water expected to be pumped in the future, rather than pumping less water than was consumed in the past. To meet these criteria, GMD3 may evaluate a project not just based upon the recent use

Commented [BD42]: Much of this section may also be good material to move to a policy statement.

Commented [BD43]: We have been working hard to eliminate this...it seems to me we have achieved much and that a lot of the problem is that people are unaware and still operating under the oks rules. Aren't statements like this reinforcing this or do are there still "many examples out there in these various spheres?"

Commented [BD44]: We agree that we must be careful to insure flexibilities do not create problems. The WCA amendments do not require stipulations. Move to GMD policy statement.

Commented [BD45]: Move to policy statement.

of the project's wells, but include other wells within the same source of supply to determine use standards and depletion trends. The purpose of this evaluation is to give due consideration to past conservation by easing the reduction requirements to gain flexibility for users who are already using less water per acre than the other water users in their neighborhood. It also greatly diminishes any advantage gained by pumping the maximum allowed each year unnecessarily and ensures that the flexibility will be used to achieve groundwater management objectives.

Goals for Problem 9: Promoting a culture of water conservation

1. Work with state agencies to ensure that future programs do not have a "use it or lose it" element and are in keeping with a culture of conservation and efficient water management.
2. Do not allow term permits or temporary permits that augment existing water rights for use that would not be allowed through a change.
3. Work with DWR to view "local source of supply" less restrictively, but with process and respect to other property rights. If necessary, support legislation to clarify the policy.
4. Support water right flexibility, but ensure that water use is not increased so as to impair the general supply.
5. Do not reward inefficient water use over past conservation.

Commented [BD46]: We are happy to work with you on specifics. Add: actively work to inform members of changes in state law to remove "use it or lose it" and encourage them on that basis to minimize inefficient use of water.

Commented [BD47]: ???

Problem 10: Public Education and Involvement.

GMD3 will work with local citizens to educate and inform them on state water policy, local water concerns, new and existing federal programs, and district activity.

Goals for Problem 10: Public Education and Involvement

1. Support schools, clubs, groups, etc. with presentation or other public information when requested.
2. Produce a quarterly newsletter to notify the public of district activity.
3. Use weekly radio interviews to notify the public of district activity.
4. Host meetings with local water users to educate on water declines, future availability, and the benefits of conservation.
5. Work with local state legislators to make them aware of district and state activity and educate them on water rights administration and general water doctrine.
6. Create informational videos and make them available.
7. Enhance educational programming and coordination with policy makers, community leaders, and broadly to all Kansas citizens.

Problem 11: Enforcement.

GMD3 has taken the lead on various initiatives to improve resource data and water right compliance, such as mandatory flowmeters and well spacing requirements. GMD3 works with members and DWR to enforce these requirements and works to ensure appropriate state enforcement policies.

Goals for Problem 11: Enforcement

- 1. Provide any GMD3 information that DWR requests to help with enforcement.
- 2. Ensure that enforcement from DWR is fair and reasonable.
- 3. Represent the GMD3 information properly to DWR through effective coordination prior to any enforcement sanctions issued to members.

Commented [BD48]: What does this mean? It seems to imply it is not. Again, we are happy to work with you on this if you have some issue we can address.

Commented [49]: Is this asking DWR to coordinate with GMD 3 prior to all enforcement sanctions?

Problem 12: Public Interest.

The Groundwater Management District Act established state policy that the locally organized land owners and water users, through actions empowered under the Act as directed by an elected board, have rights to determine their own destiny regarding matters of groundwater management- consistent with state water law. The term “public interest” is referenced throughout the Kansas Water Appropriation Act and the Groundwater Management District Act and other law. Therefore, it is important for GMD3 to establish the local public interest elements regarding groundwater governance and work with state agencies to ensure that local programs and regulations are consistent with the laws to define the public interest.

Goals for Problem 12: Public Interest

- 1. Ensure that district activity is in the best interest of the local public.
- 2. Work with state and local agencies and legislators to clearly educate and convey what the public interest is within GMD3.

Problem 13: Funding Issues.

GMD3 is working on some projects that require more funding than what is available from assessments and user fees from district members. These projects include conservation programs that provide payment to users who conserve water or improve efficiency, studies to help communities and other water users develop future water use plans, and water transfers. GMD3 actively pursues grants to help fund these projects, and solicits donations to help find a feasible water transfer solution.

Goals for Problem 13: Funding Issues

1. Seek grants to fund projects from outside sources to supplement the GMD3 budget for management program activities.
2. Solicit funding grants, donations and partnerships as needed, and especially for expensive and ambitious projects such as for water transfers into the District.

The governance of groundwater supply by the GMD3 for the District is implemented under the approved Management Program Document, Board by-laws, Board policy resolutions, state administrative rules adopted for the District and the actions of the Board of Directors of GMD3 to provide recommendations as authorized by state law. A complete understanding of the local groundwater governance should include a review of these and other pertinent documents, with questions directed to the Board, the Executive Director or an appropriate legal counsel.

Commented [HK50]:
Another governance statement. Move to Policy section. See comments on opening section.

APPENDIX

Problem 13: Measuring the District's Success.

GMD3 is responsible to its constituents to report on its progress. GMD3 will produce a work plan with measurable goals and objectives, and an annual report on its progress towards the goals set forth above to the board and will post the report on GMD3 website.

Draft 4/5/2017