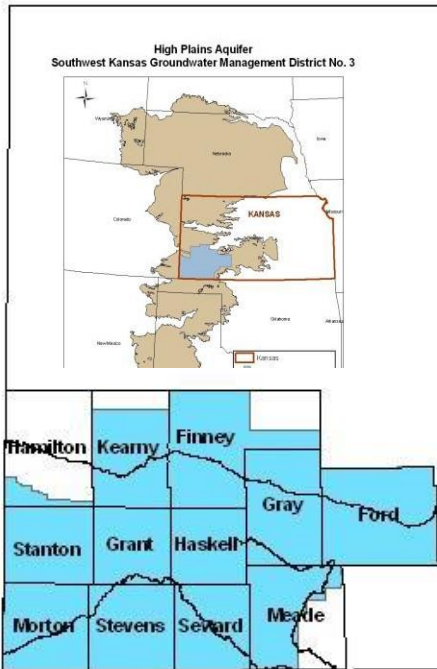


1 **Official Management Program**
2 **Southwest Kansas Groundwater Management**
3 **District Number 3 (GMD3)**

4 2009 E. Spruce Street, Garden City, Kansas 67846 (620) 275-7147

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

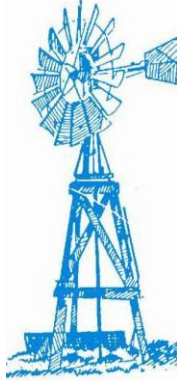
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10 **2024-2025 Board of Directors:**

11 Chad McCormick, President - Industrial at large
12 Randy Hayzlett, Vice President – Surface Water
13 Garret Love, Secretary - Gray County
14 Mike O’Brate, Treasurer - Finney County

15 Jacob Harshberger, Director - Ford County
16 Reid Shrauner, Director - Morton County
17 Kent Dunn, Director – Seward County
18 Carl Clawson, Director - Meade County
19 Zachary Gale, Director - Hamilton County
20 Fred Jones, Director – Municipal at large
21 Andy Moser, Director - Stevens County
22 Bret Rooney, Director - Haskell County
23 Seth Nelson, Director - Stanton County
24 Kyle Maddux, Director - Kearny County
25 Clay Scott, Director - Grant County



26
27

28 **Southwest Kansas runs on water.** The activities of this Management Program are an
29 expression of public interest to be considered in all activities that affect the District water
30 supply. Policy and methods herein are intended to advise and assist all in wise management
31 of the water resources. They are not considered enforceable apart from Kansas statute and
32 administrative rules and advocate a consistency of thought and behavior in policy
33 implementation. Program implementation documents, such as annual reports, audits, rules,
34 bylaws, resolutions, guidelines, and action plans are available and posted on-line.

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INTRODUCTION



This official Management Program document discusses logical policy and behavior in the relationships and interdependent roles of the Southwest Kansas Groundwater Management District No. 3 (GMD3) regarding members and water management partners to conserve and develop the water resources of the state and achieve the mission of the governing body. The GMD3 local thinking and action is a public right delegated by the Kansas legislature. Acting on that right, GMD3 seeks to protect and enhance the instrumental and intrinsic values in the enjoyment of water resources shared by all. A challenge we face is defining limits and adding supply improvements that are relaxed enough to avoid unnecessary economic constraints yet restrictive enough to avoid complete loss of supply in the long term. This document outlines six Management Program activity areas in no particular order: A) Water Rights Administration Assistance; B) Water Conservation; C) Models, Research and Development; D) Quality Water Protection; E) Ark River Management; and F) Outreach, Advocacy and Education.

PURPOSE FOR LOCAL GROUNDWATER MANAGEMENT

The Groundwater Management District (GMD) Act and “the right” to manage groundwater use. In K.S.A. 82a-1020, the legislature set two elements of policy in law for groundwater management: “...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.”

These activities assure our locally elected leaders, members and official Management Program are enabled to do our part in keeping our communities and economy strong. A 2023 Kansas Legislative Post Audit report of GMD efforts to conserve groundwater is linked [HERE](#).

Objectives of the legislature for 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.
6. Determine all high priority groundwater areas and adopt action plans to reasonably address concerns.
7. Provide annual written reports to the legislature and post them on the District website.

Purposes for which GMD3 was organized in 1976:

1. 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.

Public Interest. Under the GMD Act (82a-1020 et seq.), the official Management Program document and activities of the elected governing body of GMD3 (Board) are considered an expression of public interest authorized by the legislature to be considered by state officials and water agencies. The Kansas department of

1 agriculture (KDA), including the division of water resources (DWR) and the division of conservation
2 (DOC), chief engineer, Kansas water office (KWO), Kansas department of health and environment
3 (KDHE), state corporation commission (KCC), university of Kansas (KU), Kansas geological survey
4 (KGS), Kansas state university (KSU), Kansas state university extension system and local conservation
5 districts shall provide assistance and support to each board as is reasonably necessary for the achievement of
6 the groundwater management goals set forth in 82a-1044 of the GMD Act for action plans. The Kansas
7 water authority (KWA) shall consider the efforts of such agencies to assist the GMDs when recommending
8 appropriations of the state water plan fund to the Legislature.
9

10 MISSION, MEMBERS & POWERS

11 **MISSION:** *Act on a shared commitment to conserve and develop water supply to grow the social,
12 economic, and natural resources well-being of the District for current members and future generations in
13 the public interest.*
14

15
16 **Water use in GMD3.** For established legal purposes other than produced water associated with oil and gas
17 exploration, water use is supervised under the prescribed duties and powers of the state Chief Engineer,
18 Kansas Department of Agriculture/Division of Water Resources (KDA/DWR) staff and assisted in the
19 District by GMD3 to implement the public interest of the Management Program in harmony with state
20 administration. Generally, groundwater use is declining over time as stored supplies are mined at a higher
21 rate than can be naturally replenished. For reasons that include declining water levels, well yields and
22 conservation efforts, the decade ending in year 2022 revealed over 2 million acre-feet less groundwater
23 pumped than in the prior decade. The future economy of Kansas depends on planning and brave actions
24 from servant leaders at all levels, including the Board of GMD3.
25

26
27 Groundwater management can be difficult for many reasons that include:

- 28 1. Groundwater is a shared resource.
- 29 2. Groundwater inflows and outflows are difficult to observe and cannot be measured directly.
- 30 3. Surface water and groundwater are interconnected.
- 31 4. Aquifer boundaries and characteristics may be locally unknown or poorly defined.
- 32 5. Groundwater management requires specialized model tools.
- 33 6. Groundwater conditions can vary on multiple time scales.
- 34 7. Groundwater use can pit present needs against future needs.
- 35 8. Diverse local, state, and federal interests, institutions and authorities require significant
36 coordination and outreach activity to secure the necessary productive partnerships.
37

38 **GMD3 Members.** A GMD3 member is an eligible voter described in the GMD Act (K.S.A. 82a-
39 1021(a)(5)). Basically, any water user of an acre-foot or more annually or an owner of 40 or more
40 contiguous acres of land in the District is a member. Most domestic well users in the District annually use at
41 least one acre-foot (325,851 gallons) of groundwater, meeting the criteria to be considered eligible voters of
42 the District. A person must be a member of the District to be eligible to serve on the GMD3 governing body.
43 County residence eligibility requires that the principal residence must be in that county. Members find ways to tie
44 their work and life to four **core values** in their water management and balance between them in no order (See S
45 Lauer, Social Aspects of Groundwater Conservation, 2020): **Individual Responsibility** - Members desire the
46 ability to make their own water project decisions based on what they believe is best for their operations and
47 families. **Fairness** - Members desire that the benefits and sacrifices involved in water management are equitably
48 distributed. **Community** - Members desire to have good relationships with their neighbors and to have

1 functioning towns with schools, hospitals, churches, and businesses. **Stewardship** - Members desire to preserve
2 the benefits of groundwater for future generations. Individual members emphasize some values more heavily
3 than others. The same cultural incentives for water conservation may also become cultural barriers when
4 incentives are viewed as insufficient or conflicting.

5
6 **Director Service, Bylaws and Resolutions.** Local governance determined there would be representation
7 by county residence as a way of assuring broad distribution of District director service, each having a duty
8 to serve the entire aquifer community. Member Board service is spelled out in the board bylaws posted
9 [HERE](#). Board resolutions are posted online [HERE](#), and individual member service is commemorated in the
10 Board room of the home office and posted online [HERE](#). Any revision of the Management Program and
11 priority area action plans must be submitted to the Chief Engineer for approval prior to Board adoption. A
12 hearing is held prior to final adoption by the Board with implementation supported by state and local water
13 officials and agencies. The appropriate solutions for the 12-county area of the District depend on the social,
14 legal, economic, and hydrologic conditions.

15
16 **District Powers.** To carry out local public right and purposes, GMD3 is granted an enumerated set
17 of powers in K.S.A. 82a-1028 and amendments. In addition, other powers have been provided by
18 the legislature or by state officials that include initiating IGUCA and LEMA proceedings, identify all
19 priority management areas and adopt action plans with implementation support from other water agencies
20 and officials. Powers included without limit are:

- 21
- 22 - **K.S.A. 82a-1020** declaring the purposes of the GMD Act and establishing the public right of water users and
23 landowners to determine their destiny regarding water use.
- 24 - **K.S.A. 82a-1028(g)** to construct, operate and maintain such works as may be determined necessary for
25 drainage, recharge, storage, distribution, or importation of water, and all other appropriate facilities of
26 concern to the district.
- 27 - **K.S.A. 82a-1028(i)** to contract with persons, firms, associations, partnerships, corporations or agencies of the
28 federal government, and enter into cooperative agreements ...
- 29 - **K.S.A. 82a-1028 (m)** provide advice and assistance in the management of drainage problems, storage,
30 groundwater recharge, surface water management, and all matters of district concern.
- 31 - **K.S.A. 82a-1028 (n)** adopt administrative standards and policies relating to the management of the district
32 which are not inconsistent with the provisions of the GMD Act or KWA Act.
- 33 - **K.S.A. 82a-1028(o), (p) & (q)** to recommend rules & enforce them by suitable action.
- 34 - **K.S.A. 82a-1028(r)** to enter upon private property within the district for inspection purposes, to determine
35 conformance of the use of water with established rules and regulations, including measurements of flow, depth of
36 water, water wastage and for such other purposes as are necessary and not inconsistent with the purposes of the
37 GMD Act.
- 38 - **K.S.A. 82a-1028(u)** recommend to the chief engineer the initiation of IGUCA proceedings.
- 39 - **K.S.A. 82a-1029** adopt the official management program for the district; and
- 40 - **K.S.A. 82a-1041** to recommend adopted LEMA plans for implementation.
- 41 - **K.S.A.82a-1042** provide formal response to any rules or GMD management program changes proposed from
42 the Sec. of Agriculture or chief engineer that may alter an adopted local groundwater management program or
43 impact water use in the district.
- 44 - **K.S.A.82a-733(g)** jointly approve conservation plans required by the chief engineer.
- 45 - **K.S.A.82a-745(d),(h) & (m)** to advise in acceptable management plans for WCA's; and
- 46 - **K.S.A.82a-1906(b)** notification to water users of certain applications under review by DWR.
- 47

1 **FORMATION AND OPERATION OF GMD3**



2
3 **Funding the lead from local need.** An early southwest Kansas cooperative groundwater project
4 involved pumping “the underflow” of the Arkansas River valley as a local and federal
5 Reclamation project in 1904 near Deerfield, Kansas to supply irrigation when surface water river
6 flow was in short supply. Drought and advancements in irrigation technology development
7 through the first half of that century overwhelmed the sustainable supply of water resources and the
8 institutional tools available at the time to manage water. In the 1960s, good, creative, local problem-solving
9 leaders insisted on the adoption of mandatory standards, registration of groundwater water rights, supply and
10 use limits, minimum well spacing, and special groundwater management area authority to protect local
11 interests through managed groundwater depletion. Good state and local action followed. A public vote to
12 form the District was held on February 24, 1976, following approval of the petition and the issuance of a
13 report of public interest by the Chief Engineer. The vote resulted in 1,155 voters in favor and 230 opposed.
14 Now all annual meetings are held on the second Wednesday of March unless changed with notice. GMD3 is
15 governed by a 15-member volunteer Board of Directors that is elected by a general constituency of qualified
16 voters who attend the annual meeting. Members may be elected to serve as one of the 12 county positions
17 and there are also three “at-large” Board positions designated to represent Municipal, Surface water, and
18 Industrial use respectively. GMD3 activity is financed by an annual land assessment and groundwater user
19 fee levied against the landowners and water users in the District based in an annual budgeting process. A
20 public hearing of the proposed budget and level of assessments needed to finance the budget is conducted
21 usually in July. For 2023 and 2024, the land assessment has been \$0.05 per acre and the water withdrawal or
22 “user” fee has been \$0.16 per acre-foot.

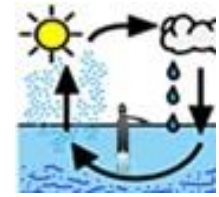
23
24 **Table 1. Eligible land for assessment and water appropriations for a user fee (2023).**

25

<u>County</u>	<u>Total Assessable Acres</u>	<u>Assessed Acres</u>	<u>Wells</u>	<u>Authorized Acre-Feet</u>
Finney	627,928.64	626,693.17	1,085	559,569
Ford	663,966.84	663,247.21	660	200,904
Grant	353,772.82	353,596.32	642	325,962
Gray	538,815.10	538,318.06	1,303	420,978
Hamilton	72,317.62	72,317.62	73	40,378
Haskell	368,142.60	368,055.89	907	460,973
Kearny	454,471.65	453,899.41	494	228,466
Meade	401,069.55	400,861.43	553	274,010
Morton	354,098.82	353,885.46	307	120,129
Seward	382,211.94	381,810.53	501	279,435
Stanton	441,341.78	441,208.88	625	323,140
Stevens	445,347.05	445,210.23	705	378,059
<u>GMD3 totals</u>	<u>5,103,484.41</u>	<u>5,099,104.21</u>	<u>7,855</u>	<u>3,612,003</u>

26
27 **GMD3 Office.** The District is managed from an office located at 2009 E Spruce Street, Garden City,
28 Kansas, and is operated by the Board who is responsible for setting policy and objectives for the District and
29 employing the professional staff needed to carry out GMD3 program and activities. As much local input as
30 possible is directed at new and improved methods of managing the District water supply. The Board
31 generally meets the second Wednesday of each month, and all meetings of the governing body are open to
32 the public in compliance with K.S.A. 75-4319.

1 **DESCRIPTION OF THE GMD3 AREA**



Water Cycle

2
3 **General Area Characteristics.** The GMD3 area is approximately 5,338,334 acres,
4 or about 8,341 square miles of land. This includes all of Morton, Stevens, Seward,
5 Stanton, Grant, Haskell, Gray, and Ford Counties as well as parts of Meade, Finney,
6 Kearny, and Hamilton Counties in the southwest part of Kansas and the west central
7 part of the Great Plains region of the United States. The District is closed to most new
8 appropriations from the Ogallala/High Plains (OHP) Aquifer. New projects must utilize or change existing
9 water rights where sufficient water supply can meet water needs.

10
11 **Table 2. General water budget estimates for GMD3.**

Number of counties served by GMD3	12
Number of non-domestic water rights	12,500
Authorized annual groundwater use	3.6 million acre-feet
Average annual groundwater use	1.6 million acre-feet
Average annual recharge from precipitation	210,000 acre-feet
Average annual return flow recharge (13%)	208,000 acre-feet returned
Irrigation-enhanced precipitation recharge, inflows from Dakota, streamflow capture.	acre-feet gained or returned from non-consumptive activity
Reduction of acres irrigated (1989 to 2022)	175,257 acres
Average annual reduction in storage	500,000 acre-feet
Use reduction the last 10 years (2013 to 2022) vs prior 10 year period	2 million acre-feet (13.7% avg annual reduction)

12
13 Values are estimates from state data. Updated GMD3 model data in 2024 may improve these estimates.

14
15 **Surface Water.** Precipitation is generally the lowest in the state with average annual measurements of 15 to
16 18 inches and as little as 4 inches (2011 drought - Morton County). There is only one surface water reservoir
17 in the District not sustained from groundwater pumping, which is the privately owned Lake McKinney on the
18 Great Eastern Ditch Irrigation System near the Arkansas River in Kearny County. Now, deliveries of Arkansas
19 River flows from Colorado and rain runoff events in the intermittent streams of the District supply a small
20 fraction of the water used or replenished annually. The District water supply has changed since GMD3 was
21 formed as river flows have greatly diminished from what once occurred across the region. Flows have nearly
22 ceased all together across the District with only nominal annual aquifer recharge from surface flows. More
23 attention is needed to restore and manage aquifer recharge from renewable sources.

24
25 **Groundwater.** Groundwater is water below the surface of the earth. The most common local source for about
26 8000 wells is the Ogallala/ High Plains (OHP) Aquifer. Generally, one inch of water fills about 6 to 12 inches
27 of OHP geological formation to saturation, depending on the size and connectivity of sediment pore space.
28 The District area generally contains high-quality groundwater supplying one of the highest-intensity
29 groundwater development in the country. In drought years, the annual use in GMD3 nears half of all
30 groundwater used in Kansas.

31
32 **Groundwater decline.** The difference between demand consumption and supply replenishment has
33 created an annual gap in stable water levels recently in the District of about 500,000 acre-feet (KGS). Data
34 from the GMD3 area groundwater model updates indicate an overall decline in supply exceeding 30% since
35 predevelopment (50 years) conditions and a 10 year drop in use from the prior decade of over 2 million acre-
36 feet. Large declines in water storage will not recover and sustain present use levels without new sources

1 of water to augment and replenish supply. Changing the diversion pattern of groundwater can alter its availability long
2 term, requiring careful review and evaluation. Though declining, the OHP groundwater reservoir continues to supply the
3 most productive agriculture region of Kansas. Technology improvements add water value that helps to maintain the
4 economy.

7 OGALLALA/HIGH PLAINS (OHP) AQUIFER CHARACTERISTICS

9 Generally, the OHP Aquifer is a series of groundwater reservoirs consisting mainly of a widely varying
10 assortment of sand, gravel, silt, and clay of Tertiary and Quaternary age eroded off the Rocky Mountains
11 that were deposited by sluggish streams that flowed eastward across what became the High Plains region of
12 the central US. Maps can be found in the Kansas Geological Survey (KGS) High Plains Aquifer Atlas
13 available online [HERE](#). The dewatered OHP groundwater reservoir space provides available storage
14 capacity of more than 60 million acre- feet (KGS model for GMD3). The present GMD3 groundwater model
15 has been found to overestimate supply in storage for the District and an OHP Aquifer model update project is
16 planned for 2021. The OHP groundwater reservoir in the District varies widely in type of material, thickness, and
17 layer continuity. Even beneath a single section of land, well yields can range from tens of gallons per minute to
18 thousands of gallons per minute. The remaining saturated thickness of the principle OHP groundwater reservoir
19 system ranges from 20 feet to 600 feet within the District, with significant variability in the productive portions.
20 Thus, well capacities range from a few gallons per minute (gpm) to 3,000 gpm. Historic depletion of saturated
21 thickness locally also varies spatially across the District.
22

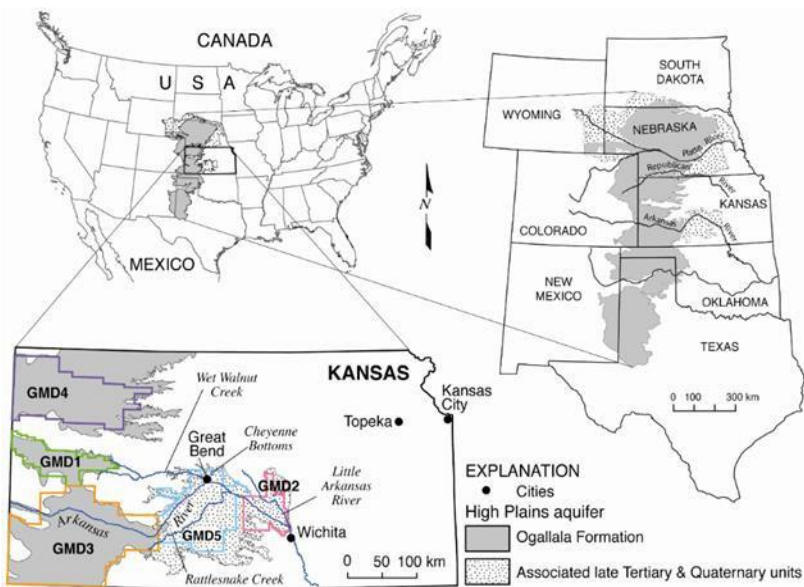


Figure 1. Extent of the Ogallala/High Plains Aquifer

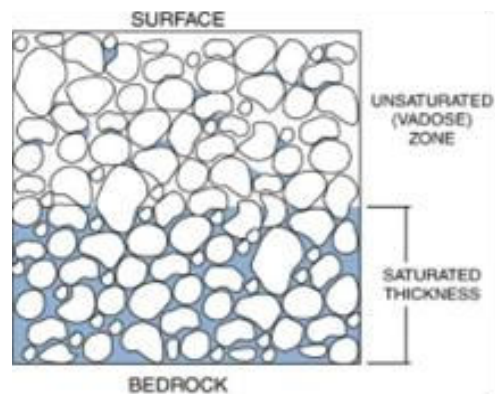


Figure 2. Formation saturated thickness (KGS)

23 **Groundwater flow.** In GMD3 across southwest Kansas, regional lateral flow of groundwater is
24 generally, from west to east-southeast across the District at an average rate of about 1 foot per day or less
25 under the normal regional tilt in the static water table (KGS). Early recharge rate studies found a similar
26 vertical rate of descent to the water table. Locally, a higher rate of groundwater flow can be estimated where
27 there is a greater slope in the water table, especially during local well pumping drawdown effects.
28 Groundwater travel rates can be significantly affected where water level gradient is increased near a
29 pumping well and flow can exceed 300 feet per day (KGS) where sufficient conditions allow. Reduction of

1 aquifer saturated thickness over time reduces pumping capacity as saturated thickness is reduced by
2 groundwater reservoir depletion. Depth to static water elevation from the land surface is highly variable and
3 may exceed 400 feet. Some wells in northern Finney County may be completed in geologic voids in the
4 Niobrara Chalk formation and referred to as “crack wells” that typically produce a high volume of water until
5 the crack or void is dewatered. More KGS information on groundwater formations above the Dakota is
6 available online [HERE](#). In the southernmost part of the District, Cretaceous Age formations may be absent
7 where Permian bedrock formations directly underlie the Ogallala associated formations. For groundwater
8 management purposes, OHP Aquifer formations include all hydrologically connected formations where
9 hydrostatic pressures are similar and demonstrate connectivity.

10
11 **Water quality.** Water quality and quantity are interrelated and inseparable elements of water supply. The
12 quality (or usability) of the groundwater in the OHP and Dakota Aquifer groundwater reservoirs are
13 generally fresh. Some areas are experiencing deteriorated water quality such as high concentrations of
14 chloride and sulfate salts that result in lowered land productivity, lowered crop yields, and degraded topsoil.
15 Electrical conductivity (EC) data is used as a general measure of the chemical quality of irrigation water (see
16 below for brief definition). Low EC measurement is generally desirable in the natural capitol of water supply
17 for agricultural irrigation use because it indicates a low salt content and greater usability of the water. In
18 some locations, mineralization, including radionuclide levels, exceed recommended limits or maximum
19 contaminant levels (MCLs) for drinking water established by the US Environmental Protection Agency
20 (EPA). Poor quality sources can deplete usability of stored water supplies.

21 22 23 **BEDROCK AQUIFERS**

24
25 Bedrock aquifer formations are part of the OHP Aquifer where they are hydraulically connected to younger
26 formations. They are considered separate aquifers where there is little or no hydrologic connection and the
27 porosity and permeability are generally low, yielding small amounts of water to wells. This creates a user
28 and supply administrative challenge to know where the bottom of the OHP Aquifer may be, which is
29 important to manage pumping effects.

30
31 **Dakota.** Older, less permeable, finer grained Oligocene deposits and an unconfined hydraulically connected
32 sub-cropping Dakota Aquifer System comprised of Dakota sandstone, Kiowa shale, and Cheyenne sandstone
33 formations (rests below the Ogallala Formation. A key marker bed adopted for the GMD3 Management
34 Program is the Cretaceous age black marine shale bed known as the Graneros shale. It is about 20 feet or
35 less thick and readily identifiable in drillers’ logs where it exists stratigraphically atop the Dakota Aquifer
36 system except where the black shale sub-crops along a meandering line roughly east west across the District
37 (See KGS OFR 98-37, Plat A [HERE](#))The Dakota Aquifer system is comprised of sandstones and shale that
38 typically yield much smaller amounts than the yield of wells in the Ogallala Aquifer. KGS Dakota Aquifer
39 information is available online [HERE](#).

40
41 **Confined Aquifers.** North of the sub-crop line, the Dakota Aquifer is considered under confined aquifer
42 conditions and therefore by rule, a separate groundwater reservoir source from the OHP aquifer system that
43 is open to new appropriations of water. In comparison to the thousands of wells completed in the OHP
44 Aquifer system, less than 100 non-domestic wells are authorized to tap only the confined Dakota Aquifer
45 groundwater reservoir. The characteristics of these groundwater reservoirs can vary dramatically, and
46 recharge areas extend west of the District at higher elevations in southeast Colorado.

1 **Permian.** The Upper Permian age red beds may contain sandstones with some usable groundwater locally
2 and may also have water quality concerns that require careful water sample evaluation, monitoring and
3 supervision to prevent water usability depletion of the fresher groundwater supplies. Further investigation of
4 potential uses of Permian age groundwater reservoir water for irrigation can be expensive at depth, and some
5 geological testing and completion of deep wells for irrigation have occurred as the shallower sources
6 become depleted. Efforts to evaluate the usability, reliability, and feasibility of these potential sources
7 together with newer technologies to treat poor quality water from marginal sources to usable standards are
8 part of the GMD3 efforts to develop and manage additional water supplies.

9
10 **Deep brackish bedrock groundwater reservoirs.** KWA Act requires poor quality appropriation first,
11 where feasible. Kansas regulations require the petroleum industry to protect fresh and usable groundwater
12 reservoirs from contamination by confirming minimum depths for surface casing in a petroleum exploration
13 borehole. Kansas law requires the state to put a priority on use of poor-quality water where feasible ahead of
14 authorizing fresh water sources. This policy may require adoption of base feasibility criteria to further
15 implement elements of Kansas law and the Management Program.

16
17 **GMD3 Ark River.** The Arkansas (Ark) River is the principal surface water source into the District and
18 recharging Aquifer storage. The quality of this source is now one of the most saline rivers in the U.S when
19 flows are not sourced from Colorado reservoir release deliveries under interstate agreements. There are six
20 surface water irrigation ditch systems today that have senior water rights from the Ark River between the
21 Colorado-Kansas Stateline and Garden City. These ditch companies are owned by farmer-shareholders who
22 control approximately 140,000 acre-feet of senior surface water rights with diversions that are governed by a
23 federal court decree, pre-1945 vested rights, and an interstate river basin compact. Aquifer recharge is an
24 amenity of river and stream flow with natural and managed groundwater recharge benefits. Significant
25 transit loss groundwater storage benefits occur from reservoir deliveries and other sources of river flow
26 across the District. Surface water rights developed below Garden City have lost nearly all historical supply
27 flows and associated aquifer recharge benefits. Lands below Garden City now rely entirely on groundwater.
28 The GMD3 Management Program uses historical management practices and measured flows at the Garden
29 City and Dodge City river gages for strategies both above and below Garden City, dividing the GMD3 Upper and
30 Lower Ark River GMA's respectively for Managed Aquifer Recharge (MAR) activity. From the large flow event
31 across GMD3 in 2020, river flow can provide MAR of 200,000 acre-feet per month. Additional KGS information on the
32 river area is posted online [HERE](#).

33
34 **Colorado and Kansas Arkansas River Compact.** See Ark River Management activities.

35
36 **Cimarron River Basin.** Natural pulse flows from precipitation runoff events are identified historically in
37 the hydrologic record and literature. These pulse flows have been a key aquifer recharge source that has
38 declined significantly over time. These supply sources require protection and management to assure
39 continued groundwater recharge as an important renewable supply to GMD3 member water rights. The
40 exception to intermittent stream flow conditions is an approximately 20-mile reach of the Cimarron River
41 below Highway 54 east of Liberal, Kansas, where the river normally has base flow from upper Permian
42 natural salt springs as flow leaves the District and the state after crossing southeast Seward and Meade
43 counties. KGS information on the Cimarron basin can be found [HERE](#).

44
45 **Kansas and Oklahoma Arkansas River Compact.** The 1966 Kansas and Oklahoma Arkansas River
46 Compact limits new conservation storage capacity or water transfer amounts for each state in six major
47 topographic sub-basins tributary to the Arkansas River basin that together span the entire southern border of
48 Kansas. The Cimarron River sub-basin that includes Crooked Creek drainage in the District is both an

upstream and downstream area under this interstate compact. The compact regulates only the amount of storage that can be constructed by sub-basin, the amount of water that can be transferred, and how such transfers relate to allowable storage. In addition, the compact is a forum to “encourage the maintenance of an active pollution abatement program in each of the two states and to seek the further reduction of both natural and man-made pollution in the waters of the Arkansas river basin.” The Kansas – Oklahoma Arkansas River Commission is the interstate administrative agency that operates this compact. It provides a forum to promote interstate comity between the states of Kansas and Oklahoma regarding the equitable apportioning and orderly development of shared basin water. More information is available online [HERE](#).

ECONOMY

Agriculture - The Economic Engine. To grow and sustain the Kansas economy, the agriculture industry must grow with a renewable water supply in southwest Kansas. Significant communication and coordination must occur on wise policies to support this activity. The statewide KDA AG Growth Strategy is referenced as a consideration of the Management Program and available online [HERE](#). In an area of the country where there is little surface water and high evaporation rate, a groundwater management program assures water supply and strong economy. GMD3 members not only manage the soils for sustainable production, but they also work to improve source water management and conservation. Significant proactive steps are occurring to preserve and extend usable water supplies. In recent years, voluntary, flexible, and member-driven water conservation tools have been implemented to help members manage their water rights to raise crops or livestock. Kansas developed a *50-year Vision for the Future of Water Supply in Kansas* with goals and specific action items to help ensure a reliable water supply while

continuing to grow the economy. Kansas ranked third nationally in numbers of cattle and calves on ranches and in feed yards in 2015 with 6 million head and second in the fed cattle market in 2014 (USDA, 2016). Animal agriculture in the District provides a significant portion of these state numbers, due in part to climate and reliability of locally sourced irrigated grains and forage. K-State Research and Extension recently updated their Kansas Irrigation Trends linked [HERE](#) that illustrates some remarkable trends of increased conservation water use efficiency over time. This includes the figure for the Kansas Corn Yield Trend (Figure 8) as well and the reported growth of irrigated acres for triticale, the change in irrigated acres in GMD3 and the change in average acre-foot per acre applied. The District is one of the fastest growing regions for dairy production in the United States with the advantages of open spaces, favorable climate, irrigation for consistent high-quality forage, and abundant groundwater at a safe depth that separates nutrient management activity from water stocks. GMD3 is home to the largest milk drying plant in North America, located in Garden City. GMD3 staff can assist in determining life expectancy of water in certain locations to ensure future farm and project viability.

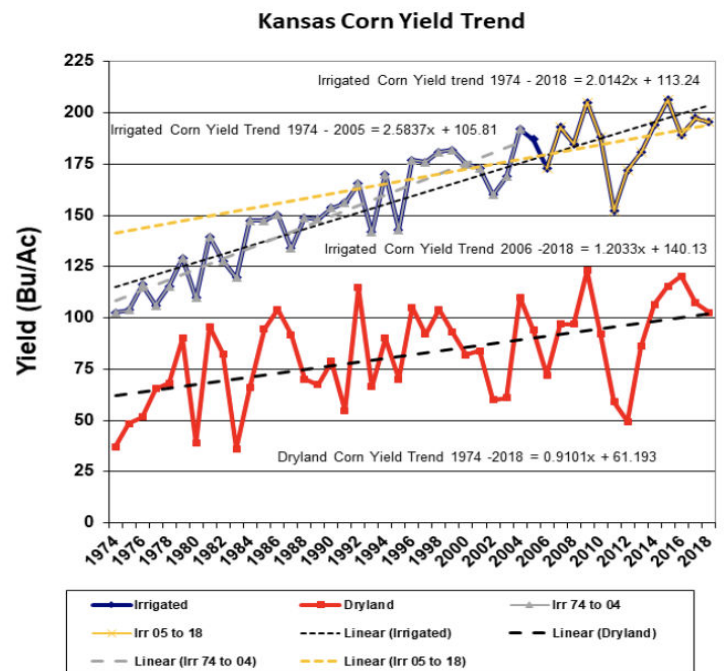


Figure 3. Kansas Corn Yield Trends 1974 Through 2018 (KDA Farm Facts).

Value of water use in GMD3. Value drives management. All values and costs should be considered when valuing water because they exist in every water transaction for use, usability or refraining from use. GMD3 acted to advise 1999 session SB 287 work and commissioned an economic study by the Docking Institute of Public Affairs in 2000 to examine through 2020 “The economic impact of an acre-foot of water on the economy of Southwest Kansas (2001)” and is available online [HERE](#). This work explored management policy scenarios and cost benefits. GMD3 will work with partners to develop and solicit proposals to update estimated water values to inform Management Program implementation.

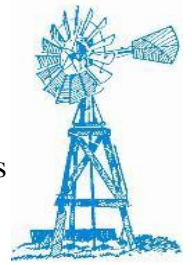
Table 3. District USDA 2017 Farm Facts, available online [HERE](#). Updates available in 2024.

County	No. of Farms	Farm Acres	Crop Acres	Irrigated Acres	Crop Mkt Value (\$1000)	LVSTK Value (\$1000)
Finney	450	790,500	679,472	186,357	181,137	641,954
Ford	505	669,832	529,171	67,068	108,771	406,481
Grant	315	358,649	304,628	82,239	80,280	733,861
Gray	422	556,070	439,359	116,874	119,343	871,310
Hamilton	353	544,086	435,412	20,481	41,273	294,387
Haskell	207	363,751	320,883	116,962	106,168	1,052,929
Kearny	299	516,230	415,995	53,209	76,465	204,513
Meade	407	587,924	331,600	93,775	90,381	143,004
Morton	323	401,305	330,988	31,969	40,054	94,760
Seward	282	360,711	263,690	95,497	80,237	344,461
Stanton	220	435,254	396,108	54,305	72,702	60,791
Stevens	377	455,494	369,963	138,437	109,942	230,624
Total	4,160	6,039,806	4,817,269	1,057,173	1,106,753	5,079,075

Land market valuation of groundwater. Usable groundwater and an established water right affects land values. Research at K-State in this area is ongoing, and has provided estimated irrigation premiums and implicit marginal valuations of water in-storage using parcel-level transaction data for land sales in the Kansas portion of the OHP Aquifer that includes GMD3. They found that agricultural land values were 53% higher for irrigated parcels than non-irrigated parcels on average and that the irrigation premium has increased at an average rate of 1.0 percentage points per year over the sample period (1988–2015). Spatial heterogeneity in irrigation premiums is explained by differences in saturated thickness of the aquifer. Differences in well yield potential across the aquifer also play a role in irrigation premiums. Water in-storage is capitalized into land prices at average marginal values ranging from \$3.42/acre-ft to \$15.86/acre-ft. This work is available online [HERE](#).

Water cost analysis. Water cost/benefit analysis evaluates the economic justification of water use plans to assist in action plan formulation and choice of alternatives. Opportunity cost is a key concept in economics expressing "the basic relationship between scarcity and choice". The notion of opportunity cost plays a crucial part in attempts to ensure that scarce water resources of the District and in Kansas are used and conserved for later beneficial use. Both private and public water conservation activities have a cost that is in addition to what can be monetized in estimates of future use value. There is opportunity cost in lost benefits when choosing a less profitable activity over another more profitable and higher water demand alternative. There is also public cost in lower land valuation from lower profit opportunity. A water supply must remain usable in quality and quantity to preserve its value, but economic models rarely apply adequate assumptions to address water quality decline over time; referred to here as “water usability depletion.” A water usability factor is needed to be employed in each water risk evaluation.

PROGRAM ACTIVITIES – NATURE AND METHODS



It is well established in Kansas water policy that a public right exists to have an orderliness of thought and behavior adopted locally that assures the proper management and conservation of the groundwater resources (GMD Act). Based on that right, GMD3 conducts groundwater use and supply evaluation, collects data, addresses waste of water, conducts policy development and water planning, advises and assists member water managers and partners, supports economic development activities and represents District water user and landowner constituents in matters concerning official Management Program implementation. The elected Board is the governing body that explores the full range of potential management actions, and their costs and benefits, prepares and adopts the official Management Program and recommends reasonable rules, regulations, and standards necessary to achieve the purposes of Kansas groundwater policy. In more than 550 monthly meetings, the 15-member volunteer Board of GMD3 has identified District water use and supply problems and considered the nature and orderliness of thought and behavior needed to reasonably address them. The Board is assisted by professional staff, consultants, state officials, agencies and other important partners in water management. There are areas that offer hope for stable water supply and economic growth through a balanced approach to conserve native supply and develop additional sources of local and imported water.

Water places. A thriving water-based economy should include public benefits from public water places that elevate water awareness and provide education on water values. The Management Program advises activities for regional supply conjunctive use of both natural and constructed water infrastructure. Activities will seek to encourage people to cross traditional collaborative boundaries so areas in the District may add flowing rivers, seek distributive water storage, and include public water places to enhance water awareness.

Water business. The business of water requires an understanding of public and private infrastructure investments and how they play a role in developing the economy. GMD3 will continue to work to protect river and groundwater supply for our agribusiness jobs, municipal water, and other area water benefits. For business to thrive, members need predictable water risks associated with their real property. All private and public individuals and institutions face four forms of water-related risk:

- 1) declining water supply storage.
- 2) insufficient replenishment to storage.
- 3) regulations or lack of regulatory confidence; and
- 4) reputation in how water use is viewed by the broader communities and markets.

Water risk drives the development of coping strategies as land and resource valuation declines along with declining groundwater supply.



Appropriations of water. The Chief Engineer has the ultimate responsibility under state law to approve an application, and when necessary, for a smaller amount of water than requested and to otherwise act in the public interest under his/her official duties to implement the KWA Act across Kansas. The rules and standards employed to make those decisions more appropriately specific to the GMD3 area is a fundamental interest of GMD3 to fulfill the public interest of the GMD Act and Management Program. Some level of agreement in the orderliness of thought and behavior at the state and local level is necessary to successfully implement the groundwater Management Program. The Kansas Water Appropriations (KWA) Act is the foundation of water resource management in Kansas with water conservation as part of its purpose. Authority for GMD3 to conduct Water Rights Assistance activity is included in the District Powers section on page 5. Under the GMD Act, GMD3 was created to claim the public right of local water users collectively to determine their destiny with respect to the use of local groundwater insofar as it does not conflict with the basic laws and policies of the state of Kansas. The Chief Engineer has a statutory mandate to “enforce and administer” the provisions of the KWA Act (K.S.A. 82a-706). Therefore, the decision whether to approve or disapprove a new or change application ultimately rests with the Chief Engineer. Accordingly, the Chief Engineer was granted authority to become involved in the mechanics of creating a GMD as prescribed in the GMD Act and to coordinate GMD3 activities with his/her own administration of the KWA Act. The GMD3 Board works to fulfill its role of representing all constituents through the elected Board with respect to the official Management Program in legal and administrative proceedings or before political bodies. Water conservation and management policy tools have been adopted locally and implemented collaboratively in regular monthly meetings of the governing body since 1976.

GMD3 advice and assistance. The interests of the GMD3 governing body and MP include careful review of the best information available for the best decisions in fulfilling the purposes of state water laws and policies and the District. The area water supply is used by GMD3 members according to their water rights, making the state water officials like the Chief Engineer and agency staff of KDA/DWR key partners in the implementation of the public interest of the official Management Program for southwest Kansas. A water right is not a guarantee of a water supply and depends on available water and the demands of members who own prior or senior water rights. The success of water conservation in water rights administration depends on an informed consistency approach that avoids extending or increasing local depletion rates and preserves the benefits of member water conservation efforts. Avoiding hardship or injury to member conservation efforts from water rights administration decisions have been a key purpose and activity in the formation and operation of the official Management Program.

Waste of water. Kansas water law prohibits water use amounts more than what is authorized or considered reasonable need for a use practice. GMD3 staff investigate complaints and provide information to limit water loss from wasteful activities or management negligence. This includes reducing preventable runoff and loss of usable supply from undeveloped floodwater sources. Activity that may unreasonably reduce water value may be inconsistent with the public interest of the official Management Program.

MOU conditional water right services. A compliance report service is provided by GMD3 to implement a Memorandum Of Understanding (MOU) with the Chief Engineer for change applications that may be approved under K.A.R. 5-5-11(b)(2) or K.A.R. 5-5-11(b)(3). These are generally irrigation water right changes to add land authorized to receive irrigation water with conditional terms of the water right to ensure consumptive use under the water right will not increase. GMD3 services provide the required annual acreage and use verification for a fee, with an annual report to the irrigator and to the state. This activity allows members to incorporate dryland and limited irrigation conservation practices into their water project plan to improve water and land values. State rules prohibit this activity unless monitoring agreements exist to assure water management goals.

Well yields and flowmeters. Water right administration provides supervision of groundwater use and prohibits waste. Use measurement empowers and demonstrates good water stewardship. Measurements identify opportunities for water project improvement, showcase examples of efficient use, tie use to water level response, and create other valued data uses. GMD3 staff provide advice and assistance to meet data requirements of members and partners on groundwater flow in the District. This helps managers for all types of uses make good decisions that meet their water project goals in a manner consistent with the methods of the Management Program. The governing body of GMD3 has required members to have water flowmeters on all non-domestic wells since the early 1990s and District staff continue to visit about 2,500 field installed flowmeters each year to gather data and provide service and feedback on flowmeter operations and for other water supply questions. Rules for flowmeter installation and operation have been adopted by GMD3 and by the state that incorporate manufacturer recommended installation criteria and best practices. Aquifer conditions and diversion equipment inefficiencies can complicate water measurement by introducing air and hydraulic conditions to be managed. A manufacturer seal is required on most installed flowmeters to assure accurate devices from the manufacturer. Where durable seals are not provided by the manufacturer, GMD3 hefty seals are installed while the manufacturer seal is in place to assist members against the hazards of field conditions. GMD3 staff also conduct water level measurements and flow verification tests for members seeking data to improve their management of water risks. A GMD3 inspection video is available online [HERE](#). Pressurized sanitary systems for animal agriculture and municipal diversions generally require significant planning and coordination with project managers to meet the needs of both biosecurity and flowmeter data collection purposes. Measurement technology and other factors affecting well yield are considered openly by GMD3 staff with project operators to advise decision makers.

Over-appropriation of groundwater. A public interest of the legislature for water appropriation is that the highest public benefit and maximum economical development may result from the use of Kansas water (K.S.A. 82a-711). The first concern for KWA Act over appropriation of groundwater addressed by GMD3 was the granting of groundwater rights without a standard for determining water availability beyond what was dedicated to prior water rights and resulting aquifer depletion over time. The first method for evaluating available local groundwater supply and maximum allowable rate of depletion was adopted by GMD3 on July 12, 1978, immediately after the Kansas legislature made applications to appropriate water mandatory. This water conservation tool involved calculating the potential depletion rate when all new appropriations of groundwater is used in the section of land containing the proposed well and the eight adjacent sections commonly described as within a 9-square-mile area. This technique was later changed to a two-mile radius circle around the well of new use and was relied on in conducting state duties to move resource development from unmanaged to managed development that essentially placed a clock on the water supply. Rules were then adopted for determining when to close whole townships or govern by safe yield. When GMD3 requested and received from the Chief Engineer an order closing the District OHP aquifer to most new appropriation, the safe yield standard was suspended by that order. Improved management tools are available to identify critical well conditions to inform people of potential water right impairment (when

that diversion diminishes, weakens, or injures the prior right) and water risk. GMD3 provides transparent hydrologic evaluations to advise and assist all in a transparent application review process so that members have the information they need to manage water risk and make decisions affecting their livelihoods.

Paper water. “Paper water” is considered a legitimate personal property water right on paper but lacking divertible supply from the local authorized source of supply. “Paper water” on wells in a depleted local source of supply must remain unused and not allowed to move to another location in the absence of adequate demonstration that added depletion and impairment of existing water rights will not occur. Moving “paper water” to better yielding well locations is a member water management activity that will deny supply longevity to other member wells with prior rights to a depleting supply. This is only appropriate if the effect is very small. Even so, a risk exists that impairment may be claimed and investigated by KDA/DWR. In rare cases, the result can be a prohibition on the nearby well operations and a complete loss of water supply for those projects. It is important to evaluate local conditions under the GMD3 well drawdown evaluation guidelines to fully inform decision makers and member water right owners.

Preparation of state applications. GMD3 staff assists in completing an application for a state permit or for other such water-rights related member project planning and paperwork. It shall be the responsibility of the applicant to review all such information and to submit it to the Chief Engineer or other appropriate official as required by law and as advised by their own independent legal counsel and/or technical experts.

GMD3 water right review assistance. Addressing the question of whether a proposed use or water right change will impair existing water rights is "advice and assistance in the management" of groundwater in "storage" and "all other appropriate matters of concern to the district." Changing the diversion pattern of groundwater can alter its availability in the long term. In addition to spacing and move limits by rule, analytical and numerical tool results will be calculated and reviewed when considering effects of water use proposals or plans. The estimated effect on supply to member prior rights will follow good scientific technique for consistent, explainable, and defensible results in harmony with basic water use doctrine and the Management Program. There is also uncertainty in groundwater yield estimates to be managed (see KGS uncertainty considerations posted [HERE](#)). Where sufficient local aquifer information is unavailable, a pumping test can improve confidence in a review for member and state decision makers. Elements to consider for a test include time of year, test pumping rate, length of test, pre-test conditions, measuring schedule, observation wells, multi-pumping wells, recovery period, and correct analysis method for the local aquifer conditions.

Additional wells and standby wells. Additional wells may be necessary to allow a partial sale and change of water right use from irrigation to a higher value beneficial use. Well spacing rules provide initial review limits within the local source of supply. This additional well activity is distinguishable in the Management Program from efforts to add one or more wells to supplement or restore aquifer extraction rate capacity to replace lost capacity due to general water level decline. The statewide additional well rule applied in the declining aquifers of the District may add to aquifer depletion rates over time and not protect prior rights in the over appropriated and declining GMD3 supply, based on GMD3 flow measurement observations. This may undermine the purpose and conservation strategy of the Management Program to limit the practice of adding new wells and cause a disproportionate local rate of aquifer depletion and a “chasing water” concern that shortens the time to eventual complete depletion of supply to all. A standby well is different from an additional well as it may only lawfully be operated in the event catastrophic failure of the primary well to avoid further catastrophe under emergency operations. Additional rules will be developed to further define standby well occurrence, spacing and operations under standby emergency conditions.

Depletion rate analysis. Research suggests more efficient use of groundwater reduces irrigation returns to the aquifer. There exists a question in statewide rules whether adding or restoring wells to water rights also add depletion rate and long-term water risk in the District. GMD3 will work with water managers and partners to evaluate the methods for changing water rights to manage risks. Further evaluations will fulfill the review conditions of K.A.R. 5-5-16(f) to determine any exceedance of the total annual quantity otherwise, likely to have been withdrawn absent the application approvals. Rule reform will then be considered to further implement the management methods that achieve the mission of the GMD3 governing body for the District. Multi-well use flexibility. Multi-well use flexibility can add use and cost efficiency to member water projects provided that careful evaluation of critical well concerns and appropriate emphasis on water conservation is applied to assure that changes to pumping patterns are consistent with Kansas law, rules, and the official Management Program. For example, the WCA law in K.S.A.82a-745(e)(2) may allow aggregate use flexibility between participating wells. This option can be encouraged when no impairment concerns and no added aquifer depletion rate can be demonstrated prior to operating plan approval. Optional legislative tools may not be advisable if their use may add to aquifer depletion or water right impairment. An example in the upper part of the Arkansas River IGUCA (GMD3 Upper Ark GMA) is where Multi-Year Flex Accounts (MYFA's) are prohibited by the Chief Engineer because of potential impairment of surface water deliveries down the river system. Drying aquifer conditions elsewhere in GMD3 present similar concerns.

MYFAs. The legislative provision for creating Multi-Year Flexibility Accounts (MYFAs) to better manage water use over five-year timeframes is an improvement over traditional annual water right limits. A GMD may propose a regulation specific to the GMD area, further implementing the GMD Act. GMD3 will work with the chief engineer and DWR staff to develop options for member water users to improve water management under existing water rights consistent with MYFA statutes and the Management Program.

GMD3 role in water right impairment investigations. Impairment usually refers to a condition caused when water diverted under one or more junior (newer) water rights reduces the quantity or quality of water available to one or more senior (older) water rights to an extent that the senior water right(s) cannot be satisfied. Kansas courts have further defined impairment as when that diversion diminishes, weakens, or injures the prior right (*Garetson Brothers v. American Warrior, Inc*). Changes to a water right's point of diversion, place of use, or use made of water are prohibited from impairing existing water rights, even if the changing water right is senior to the water right that would be impaired. The GMD3 governing body may advise and assist KDA/DWR with an investigation, and if an impairment is determined and caused substantially by a regional lowering of the water table, the GMD Board shall recommend the steps necessary to satisfy senior water rights. Such recommendations may include pursuing any means to satisfy senior water rights, including providing information on options for private water right purchase or lease agreements.

Well use drawdown estimates service. A cornerstone of groundwater management and water right compliance is a transparent technical aquifer evaluation procedure. GMD3 provides review of use proposals and conducts a well drawdown estimate service to water right applicants and nearby well owners using published criteria so that members can make their own water risk assessments based on their own risk profiles. Critical well drawdown evaluations provide the information members need to make the best decision they can for their business and livelihoods looking ahead for at least one generation (25 years). Multiple pumping wells can compound effects on gallons pumped per minute from a well. Wells can become partially dry and lose most of the usable water through groundwater mining and pumping practices. GMD3 employs transparent guidelines for consistent review of actual physical aquifer conditions and expectations.

Critical Well drawdown evaluation guidelines. To build trust, GMD3 encourages use of agreed-to data with shared models and analytical tools: data sharing; coordination with partners and referees; and a common set of facts and tools aid in information exchange and foster collaborative relationships fundamental to member water right compliance and improved resource management. GMD3 Guidelines For The Assessment of Well Drawdown Estimates as well as conducted evaluations are posted on the District website [HERE](#)

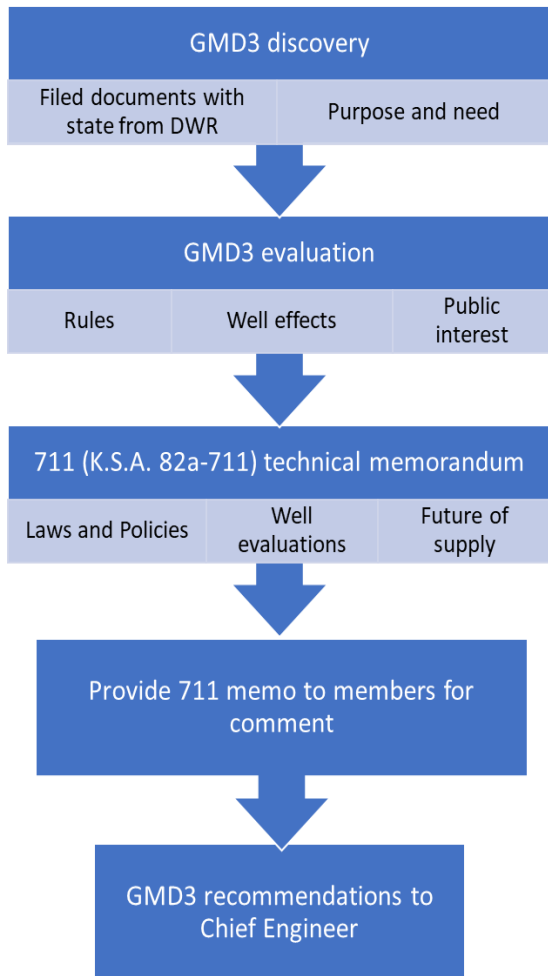


Figure 4. General GMD3 Groundwater Supply Review Process For Advising Decision Makers.

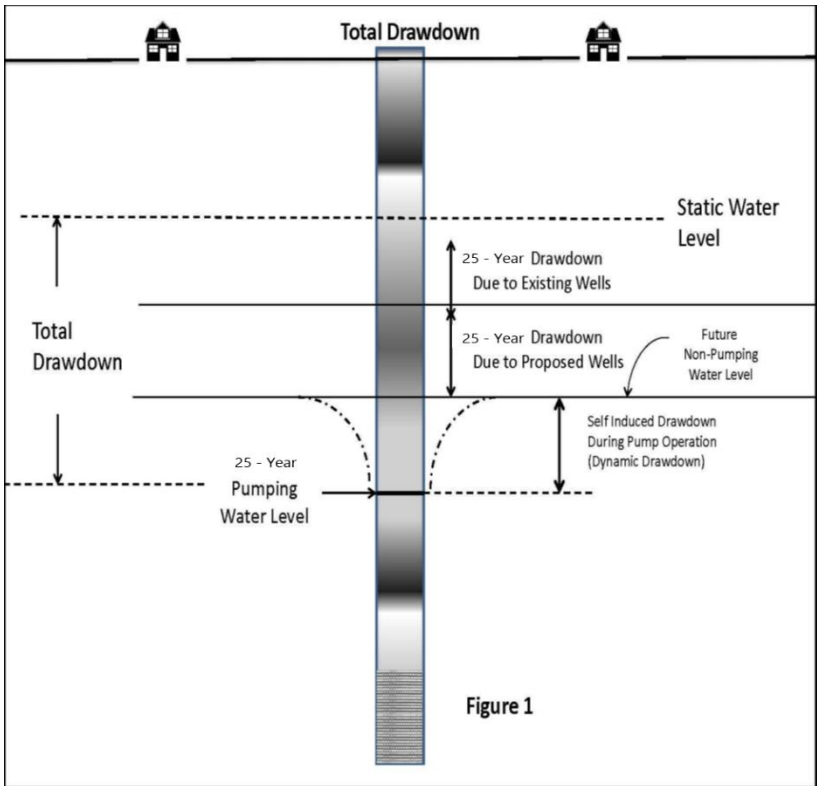


Figure 5. From the GMD3 guidelines referenced above and adapted for the GMD3 area. From the publication *Guidelines for the Assessment of Drawdown Estimates for Water Right Application Processing* (New Mexico Office of the State Engineer Hydrology Bureau Report 05-17, May 10, 2017, by Tom Morrison, et. al.).

Activity Group A - Water Rights Assistance Goals Summary

1. Promote private settlement and agreements in questions concerning water right impairment.
2. Maintain published guidelines for estimating drawdown effects.
3. To Build Trust–Use consistent and verifiable data with shared models/analytical tools.
4. Further define the limits of the OHP aquifer and local source of supply.
5. Advise and assist application review with best evidence available to identify critical well concerns, lesser quality water options and water risk ahead one generation (25 years).
6. Promote benefits for member Type 2 conservation in water right change proposals.
7. Exchange expert evaluations and information among members, partners, and GMD3.
8. Seek mutual benefits and goodwill between members.
9. Conduct a post approval additional well evaluation of depletion rates.
10. Engage partners to implement the official Management Program and recommendations.

ACTIVITY GROUP B – WATER CONSERVATION



Water conservation is wise water use that requires management activity, especially during the extremes of flood and drought conditions. GMD3 authority to conduct water conservation activity is included in the District Powers section on page 5. Ultimately the future of the Ogallala will be determined by two factors: Mother Nature and management. Water Conservation investments provide results in increased productivity and reduced aquifer decline to move society toward sustainability. Conservation will buy time while we pursue and establish new long-term solutions that include improved water distribution infrastructure. Wise use requires an understanding of the four elements of water risk (storage, replenishment, regulation, and reputation), which is essential if future generations are to have the means to live productively within the region and as a state. Public policy accelerates the adoption of water conservation products and services through reasonable standards and incentives such as regulatory risk protections, cost sharing, tax credits, rebates, and technical assistance. Members often implement voluntary undocumented groundwater conservation activities as a matter of their good stewardship. The many existing water conservation activities may be enumerated in separate GMD3 documents. Voluntary water conservation by GMD3 members across the District include without limit:

- No-till farming methods which improve soil moisture retention.
- Crop selection and field fallow rotations that require less water than historically needed.
- Improved irrigation and other systems efficiency technology.
- Participation in sponsored programs of local, state and federal partners.
- Conjunctive use management from multiple surface water and groundwater sources.
- Demand management and non-use of viable wells to leave water for future beneficial use.
- Water and wastewater reuse from primary uses.
- Use of lesser quality water where economically and technologically feasible.

Management Program water conservation activities will encourage members to conserve local sources and develop conservation of new transient source water to augment aquifer storage demands for a more sustainable water future. The goal is to provide or share scientific and practical information to managers so they can target limited resources and achieve wise water conservation methods in their personal water project management plans. The GMD3 Management Program identifies two distinct types of water conservation activity.

1 **Two Types of Water Conservation in the District**
2

3 **Type (1): Use Efficiency.** Efficient use directly benefits the user and the economy as Type (1) water
4 conservation. It is the amount of valued output per unit of consumed water. This type of activity adds
5 present economic value to each unit of groundwater diverted from storage. It also adds risk by adding
6 capacity to consume every drop available from a depleting aquifer supply and reduces the amount of
7 water that returns to the aquifer. So corrective controls may be needed if reduction in local depletion rate
8 over some baseline value is a goal of any water conservation plan. Efficient water use technologies,
9 products and services are an effective means of economic growth and improving the bottom line of a
10 water related project. As the cost and values of water increase, the business incentives for efficient use
11 increase. Research available [HERE](#) confirms that when Type (1) conservation is utilized by itself, does
12 not extend District water supply. Therefore, Type (1) conservation only saves Ogallala groundwater
13 when it is accompanied by a reduction in pumping and adds reliance on alternate sources to maintain
14 aquifer storage.
15

16 **Type (2): Maintaining Aquifer Storage.** Type (2) water conservation benefits the aquifer storage for
17 future use. Maintaining aquifer or groundwater reservoir storage requires effective conserve-to-preserve
18 activities that include without limit: managing and protecting managed aquifer recharge (MAR) sources,
19 adopting lower water demand alternatives, agreeable corrective controls, administering water rights based
20 on reasonable supply conservation metrics, and development of available additional sources of supply for
21 replacement uses. All are effective means of Type (2) water conservation that help avoid the undesirable
22 result of a significant unreasonable depletion of supply over time. Type 2 water conservation is a
23 necessary part of the Management Program to strengthening links between natural water infrastructure
24 (rivers, streams, precipitation, playa lakes and groundwater reservoirs) and constructed water
25 infrastructure (wells, tanks, pipelines, pumps, canals, dams, levees, treatment, and wastewater) to grow
26 future economic and climate resiliency in GMD3 for Kansans.
27

28 **Measuring the Conserve-to-preserve factor.** The quantity of “wet water” preserved or
29 replenished in aquifer storage may be considered the conserve-to-preserve factor and the extent of Type
30 (2) conservation in a plan or program. It is a calculation that separates the inevitable non-use of a water
31 right (inaccessible or unavailable supply) from aquifer maintaining management decisions (reduced
32 demand or replaced supply) that preserves water for the future. For dewatered well areas, there may be a
33 significant amount of “paper water.” A tool to measure the conserve- to-preserve factor will be developed
34 by GMD3 to determine proper Type (2) water conservation accounting and reporting. Water management
35 based on conservation requires metrics for reporting what we are attempting to promote to document
36 conservation for member recognition and benefits. Such benefits may be realized either in extended
37 supply, monetary incentives or for due consideration in matters of formal water conservation program
38 development. There should be no penalty for conserve-to-preserve activity to be consistent with the
39 official Management Program.
40

41 **Home-grown Action Plans.** There are many different types of plans that address business, social and
42 natural resource needs with clean water as the through line for their success. Taking the necessary action
43 to effectively mitigate and respond to water risk is a member centered interest of the official Management
44 Program. Incorporating strategies into a project water plan can anticipate and respond to water supply
45 change and hazardous events in a project water risk profile. Uses the best available science to improve
46 water conservation helps water managers identify strategies to narrow the gap between supply and
47 demand to meet stewardship goals. Local groundwater storage that is slow in lateral flow. So, members
48 can expect benefits of their managed conserve-to-preserve activities will remain home.


1 **Your Operation - Your Supply - Your Plan.** Successful plans start with data on area water supply and use
2 and add use change affects and strategies to manage them. Begin with ‘getting the house in order’ by
3 examining water use and risks in water project operations. Then engage GMD3 and KDA/DWR for consistency
4 in thought and behavior from the official Management Program and water right administration standards and
5 policy processes for water users who face similar risks. The Management Program asks that each project
6 manager use water wisely and conserve-to-preserve water by developing a water budget of minimum use
7 with maximum value return using both Type I and Type II water conservation strategies. GMD3 will
8 encourage member activity to meet water needs and leave what can remain in storage and options for
9 alternate sources of supply into a bottom-line friendly set of water conservation strategies.
10

11 **Every Manager A Water Conserver (EMAWC) activity.** Each family, farm or corporate
12 manager must act in their own way to manage climate variability and address water risk with wise water use
13 that improves their bottom line. Members are encouraged to provide personal policy leadership in their
14 groundwater conservation to help determine the destiny of their water supply and the future of their water-
15 dependent enterprise and communities. GMD3 will provide collective policy and support consistent with the
16 Management Program to facilitate wise decisions and knowledge uptake. The actions of the EMAWC will
17 be reinforced with a GMD3 Water Conservation Reporting Portal. The GMD3 Water Conservation
18 Reporting Portal will collect annual water conservation data to help members receive recognition for their
19 water conservation successes. It is very important to report decisions that save water in the aquifer and to
20 supplement the Kansas annual water-use report records for due consideration of water saving activities in a
21 declining supply when additional conservation programs are considered by the GMD3 Board and state
22 officials. Regular investment to maximize water system efficiency and charitable water conservation gifts
23 are an important part of meaningful home-grown groundwater management strategies.
24

25 **Master Water Manager activity.** The Master Water Manager pilot project can promote the EMAWC
26 activity and be an extension of industry conservation initiatives, local and state programs, and home-grown
27 water management plans. Master Water Manager will be designed to facilitate the adoption of proven best
28 management practices by significantly reducing the learning curve for water managers and promote
29 adoption of Type (1) and Type II water conservation. Master Water Manager participants will learn how to
30 manage water use using conservation practices with lawful, practical, accessible tools that may include
31 TAPS (Testing Ag Performance Solutions) strategies. Lectures, problem solving, and hands-on applications
32 will be used during teaching. The length of the program will give participants time to reflect on what they
33 learn and build a network of water managers to rely on when implementing best practices in operations. This
34 may be patterned from the North Texas Master Irrigator program from the Ogallala Water Summit in April
35 2018 in Garden City posted [HERE](#).
36

37 **GMD3 advice and assistance for the Groundwater Exploration and Protection (GE&P)**
38 **Act.** The GE&P Act is a body of Kansas law to provide for the exploration and protection of groundwater
39 through the licensing and regulation of water well contractors who operate in Kansas to protect the health
40 and general welfare of the citizens of the state. The Kansas Department of Health and Environment (KDHE)
41 Bureau of Water administers the GE&P Act with state wide rules and local GMD rules as a key partner in
42 the methods for handling the enforceable licensing of water well contractors; providing for enforceable
43 standards for well construction, reconstruction, treatment and plugging; requiring each water well contractor
44 to keep and transmit to the state, upon request, a copy of the log of the well, pump test data if available, and
45 water quality samples, and maintains within the Kansas Geological Survey (KGS) a record system of well
46 logs and water quality data that are critical to the official Management Program and available to the public.
47 Unused water well bore holes in GMD3 are often large in diameter and some of the deepest in the state.
48 Wells can be considered valued water infrastructure yet pose concern for aquifer health and member safety if

1 not kept safely. Under the GE&P Act, abandoned wells must be properly plugged unless recognized as
2 temporarily abandoned by KDHE. GMD3 will work with KDHE staff and member landowners to
3 implement practical support activities for safe well capping and a verified aquifer access network to
4 accomplish the purposes of the GE&P Act and GMD Act with minimal intrusion of private land and
5 infrastructure to protect water and member safety in the District.
6

7 **Drought Resiliency.** The official groundwater Management Program developed and adopted locally is
 considered the drought resiliency program for southwest Kansas. Long-term historical climate
variability estimates over the last 1000 years produced by Layzell and others at the KGS indicate
significant historical climate variability beyond modern experience and data. Significant value has
been realized by decoupling economy from local rainfall and climate variability through the
development and use of stored groundwater for irrigation. The current gap between consumption and aquifer
replenishment is mining the principal aquifer with an effect of adding farm and ranch vulnerability to water
risk. This presents a greater need for adaptation and drought mitigation strategies. Planning is vital for
anticipating and dealing with intensifying groundwater demands from climate variability and water right
change approvals that can add to resource stresses. This is one reason why groundwater water right
evaluations and Kansas Water Plan budgeting look ahead at least 25 years.
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19 **I-CARE (Irrigation Climate And Resource Evaluation) activity.** Local areas vary from stable levels to
20 over 30% excess use. In recent drought years, the subsequent excess pumping was as much as 50%. The I-
21 CARE activity began under a WaterSMART Drought Resilience Grant to provide management data to
22 irrigators across GMD3 as linked in our story map [HERE](#). [www.gmd3.org/icare] Water use and climate
23 feedback provide irrigation water managers with local water use, aquifer supply and climate information to
24 help create drought resilient and adaptive home-grown water management strategies. This project will help
25 build long-term resilience to drought and reduce the need for emergency response actions by providing
26 water users with valuable information that will empower them to better manage and conserve water, increase
27 the usable life of the Ogallala/High Plains Aquifer and increase farm profitability.
28

29 **Groundwater Incentivized Voluntary Easement (GIVE) activity.** Giving to maintain the heritage of
30 Kansas working lands and communities is a priority of the GMD3 governing body. Farmers and ranchers
31 don't want to limit future options for participation in wind, solar or other land development options.
32 Groundwater Conservation Easements (GCEs) offer an encumbrance of only the water right associated with
33 the land without having to encumber other elements of the land. GCEs can be much simpler to establish and
34 assure conservation in perpetuity. A study of this conservation tool potential is linked [HERE](#). In contrast to
35 CREP, this flexible and enforceable tool can help keep irrigated acres while incentivizing reduction in use
36 while keeping reduced irrigated production, rather than dry up of irrigated lands. A groundwater right
37 voluntarily gifted to GMD3 can be philanthropy that promotes the welfare of the region that may be
38 recognized as a charitable GIVE donation. Efforts are under way to have section 170h of the federal tax
39 code recognized to offer member tax benefits. A conservation restriction on the groundwater right is a
40 unique consideration to each owner, landscape, and usage having an appraisable value of the non-domestic
41 water rights associated with the land. GMD3 will seek to protect that donation in perpetuity strictly for
42 groundwater conservation purposes under the MP.
43

44 **Conservation plans approved by GMD3.** Water conservation plans required by the Chief Engineer have
45 been tied to many water rights in the District. They are intended to encourage Type (1) water conservation.
46 The KWO develops and maintains guidelines for water conservation plans (K.S.A.74-2608). Current state
47 irrigation are available online [HERE](#). Municipal (public system supply) guidelines are posted [HERE](#).

1 **Water conservation plans under state guidelines.** Under current Kansas Water Office guidelines,
2 water conservation is defined as: “*The utilization of cost-effective water use efficiency practices to curtail*
3 *the waste of water and to ensure that water use does not exceed reasonable needs.*” This general definition
4 is applicable to K.S.A. 82a-733 and other policy of the KWA Act and focuses on Type (1) water
5 conservation use efficiency activity as discussed in the GMD3 Management Program. Statewide rules are in
6 place for these water conservation plans. To implement the official Management Program, Type (2) water
7 conservation needs additional guidelines. To implement subsection (g) of K.S.A 82a-733, GMD3 will
8 review and encourage appropriate approval of conservation plans and practices under the official
9 Management Program.

10
11 **GMD3 water conservation plan guidelines.** GMD3 will investigate, develop, and update water
12 conservation plan guidelines for Type (2) conservation under separate guidance documentation
13 to achieve the following:

- 14 1. Provide a conservation plan template that can be used to meet the requirements of the water
15 managers, GMD3 Management Program, the state and federal program interests.
- 16 2. Provide considerable flexibility to develop and monitor water conservation plans.
- 17 3. Provide an online source for Guidelines and Plan templates, so that members, consultants, and
18 other management partners can easily download a template or develop a Plan.
- 19 4. Include a subsection on source conditions and risk management goals.
- 20 5. Make plans useful to member water managers, so that the majority of GMD3 water users can
21 be directly involved in the management of their local water sources and use destiny.
- 22 6. Curtail waste of water using readily available best practices that ensure water use does not
23 exceed reasonable needs.

24
25 **Corrective controls.** GMD3 has adopted conservation policy measures, advocated for mandatory water
26 right applications, conducted maximum allowable depletion rate water availability calculations, mandated
27 flowmeters, requested stiffer penalties for water right violations, and made recommendations to the Chief
28 Engineer to fulfill the public right of the District constituency. Water right administration under the prior
29 appropriation doctrine is the most direct form of corrective control provided by the Kansas legislature to
30 address water-short supply conditions. Corrective controls are considered administrative pumping,
31 replacement, or mitigation conditions that correct water-short supply problems. Changing the diversion
32 pattern of groundwater can alter its availability. Any voluntary corrective control offered to gain added use
33 efficiency under mined aquifer conditions should add benefits to aquifer storage (Type (2) water
34 conservation). Members should not unfairly benefit from higher groundwater use than their peers or unfairly
35 impose new critical well risk in a local declining supply. GMD3 will advise and assist all efforts to establish
36 appropriate corrective controls consistent with the public interest of the official Management Program. The
37 GMD3 water conservation partnership with the Chief Engineer includes recent requests for an order to close
38 the OHP Aquifer to most new water rights with some exceptions. Those small use exceptions have
39 subsequently been reviewed and a non-binding Board resolution 2018-5 passed seeking offsets from existing
40 base water rights for any new non-domestic water appropriation in the over appropriated areas and avoid
41 nullifying member conservation efforts without due consideration or compensation. Rule or legislative
42 reform will be pursued to effectuate this Board policy.

43
44 **Offsets, source augmentation and substitute supplies.** GMD3 will work with the Chief Engineer to
45 efficiently implement offsets, augmentation plans or substitute supply activities that conserve and extend
46 local groundwater supply for existing water rights. Implementation of such policies will be pursued through
47 regulation or legislative reform. The fundamental conservation policy of GMD3 is that there is no additional
48 water available in storage beyond what is needed to satisfy the existing water rights over time under the

1 mining conditions of the OHP Aquifer. GMD3 will assist in identifying existing base water rights with wet
2 water supply sources in GMD3 and elsewhere when available to support new appropriations without
3 expanding the net appropriations in the District. As most conventional water resources are already developed
4 or over exploited, there is a need to develop non-conventional options to bridge local water shortages.
5 Augmentation plans are a broad category of water operations designed to increase the supply of water
6 available for beneficial use. Replaced depletions help avoid critical well and water right impairment
7 concerns for over appropriated areas.
8

9 **Additional supply.** Private investments in water infrastructure are private decisions to develop opportunity
10 that also provides significant public benefits. In a similar way, public investments supporting major water
11 infrastructure projects will create a powerful economic driver with significant return on investment for both
12 public and private interests. Technically, non-conventional options are possible and feasible. However,
13 depending on many factors, these options are available at a high capital investment with different costs and
14 are associated with some environmental and ecological impacts and political considerations. Economic
15 studies indicate water infrastructure projects are a force multiplier. An investment in sustainable water and
16 wastewater infrastructure has a six-fold return (5 U.S. Chamber of Commerce, Why Water Infrastructure
17 Investment Would Make A Big Splash) – proving that investment in water infrastructure is sound fiscal
18 policy. Additional supply exists as nearly undeveloped in the Missouri River high flows and in other Kansas
19 river basins. Interest in reform the KWA Act by the Kansas legislature to remove policy impediments for
20 appropriation of additional supply and major water transfer development is exemplified in 2016 Legislative
21 Session HB 2059 compromise language that failed to come out of a joint negotiations committee. More work by
22 GMD3 and partners will occur in fulfillment of the mission of the GMD3 governing body.
23

24 **Flood-MAR projects.** The ability to store floodwater underground through managed aquifer recharge
25 (MAR) activities described online [HERE](#) can augment groundwater reservoirs and provide a firming supply
26 for over appropriated groundwater areas. The timing for GMD3 partnerships to develop floodwater transfer
27 infrastructure across Kansas may be good while significant Missouri Basin flood protection improvements
28 are evaluated by the U.S. Army Corps of Engineers (USACE) and an unprecedented multi-state Colorado
29 River Basin Drought Contingency Planning is being marshaled by the U.S. Bureau of Reclamation
30 (Reclamation). The current focus of potential western state partners is vital to the future of western water
31 supply and national security. Reoccurring Missouri Basin flooding sparked Kansas water waste concerns
32 over the Ogallala region and renewed interest to update the Route B Water Transfer Element of the 1982 Six
33 State High Plains Aquifer Study (High Plains Study). The 2015 update found half again more water
34 available for transfer than original estimates. The update was to move stakeholders and partners in the
35 direction of identifying preferred future water transfer projects to close safe yield gaps and meet future
36 needs. The Aqueduct update is available online [HERE](#).
37

38 **Water West.** GMD3 Management Program activity will provide leadership for solutions to curtail water
39 waste and add supply transfer activities that are distributive and regenerative by design. Kansas is
40 one of the only Department of Interior – Bureau of Reclamation states with access to excess water (surface
41 flows above existing flow targets), which puts us in an almost unique position of being able to address our
42 water issues and those of potential partners without taking water that may be directly utilized by other states.
43 Activities will include Proof-of-Concept (POC) projects and a gathering of supporters to advise and assist
44 the Secretary of Interior in conducting a phased planning authorized in PL90-537 that is favorable to Kansas
45 and GMD3. We can sustain the intensified irrigation where ag pollution runoff is not problematic and the
46 destructive high flow waters become sustainable blessings for many future generations of Kansans and
47 world citizens. Reclamation is a strong candidate to be the federal lead in a Water West project activity. A
48 newly scoped High Plains Study should include water transfer benefits for Kansas and other states.

1 **Water West Project Partners.** A gathering of project partners and officials with knowledge and interest in
2 sustainable western water and power concerns will be encouraged for adapting Kansas policy and to phase
3 in water transportation system development into state water planning. The GMD3 Management Program
4 commits the District to forward-looking evaluations to integrate natural and public water infrastructure to be
5 vigorously pursued while production income, property values and the strong agriculture economic system
6 are in place to support the activity. GMD3 economic consultants estimate the present path may create an
7 annual future economic loss in gross state product of approximately \$18 million, with a \$10 million portion
8 of that loss in GMD3.

9
10 **Inhabited source water - KDW&P partnership.** Floodwater and other abundant high flow surface waters
11 hold significant source water development opportunity for GMD3 and for other areas across the state. These
12 water sources may contain aquatic nuisance species (ANS) not living in water transfer basins. ANS concern for
13 inhabited source water transfer requires Management Program attention and a partnership with KDW&P (K.A.R.
14 115-18-10). In addition, inhabited source water may require safeguards to protect species that are considered
15 threatened or endangered under the Kansas Nongame and Endangered Species Act (K.S.A.32-957). Significant
16 coordinating with Kansas and other partners will occur to develop appropriate safeguards to protect and enhance
17 Kansas natural resource values and water enjoyment.

18
19 **Special GMAs.** A special Groundwater Management Area (GMA) is any targeted
20 and defined priority area in the District designated for unique groundwater
21 management action plan, order, rule, or activity. GMD3 may implement or support
22 special private, corporate or governance purposed areas as special GMAs with one
23 or more institutional tools uniquely applied to accomplish goals or corrective
24 controls that reasonably address water resource concerns in the District.



25
26 **Upper Arkansas River IGUCA.** The Upper Arkansas River Intensive Groundwater Use Control Area
27 (IGUCA) was requested by GMD3 in 1984 as a GMA to replace the GMD3 1977 requested moratorium on
28 new appropriation in certain counties with high vested right (pre-1945) amounts. The IGUCA request was to
29 extend corrective controls from the Colorado and Kansas Stateline along the corridor of the river aquifer
30 across GMD3. This IGUCA was ordered by the Chief Engineer after significant public process, testimony,
31 and recommendations of the Board and District members. Any revision of the IGUCA order to implement
32 new laws or policies in the IGUCA GMA should include GMD3 and public input process with GMD3
33 review and recommendations to assure adequate local consideration for implementing the rights,
34 Management Program, action plans and public interest of the GMD Act. More state information on the
35 Upper Arkansas River IGUCA is available online [HERE](#).

36
37 **Special rule Water Quality Control GMA.** Special rule conservation areas with corrective controls
38 requested and approved as state rules and regulations that address concerns such as water quantity, water
39 quality and use practices to manage and protect useable supply. For example, K.A.R. 5-23-4(c) is a special
40 rule for a water quality control area in parts of Seward and Meade Counties where naturally occurring
41 saltwater upwelling from Upper Permian Age formations moves into the overlying connected Ogallala
42 groundwater reservoir formation as groundwater use occurs, threatening water usability depletion.

1 **KDA/DOC partnerships.** GMD3 will continue evaluating groundwater areas to be designated as high
2 priority areas to offer targeted conservation services and state buy-back of water rights, subject to funding
3 through the KDA Division of Conservation (K.S.A. 2-1915). Under this program, the Division of
4 Conservation (KDA/DOC) shall make water transition assistance program grants available only in areas that
5 have been designated as target or high priority areas by a GMD and the Chief Engineer. GMD3 will seek funding
6 sources and make budget provisions to advise and assist KDA/DOC, county Conservation Districts and other
7 local, state, federal and non-government organization partners to help members incorporating available tools into
8 their wise water management plans.

9
10 **LEMAs (Local Enhanced Management Areas).** The Legislature added a new GMA tool for local GMD
11 conservation consensus in 2012 after more than a decade of development work by Northwest Kansas GMD4
12 and partners. GMD3 will support Local Enhanced Management Area (LEMA) development with group
13 facilitation resources and evaluate suggested goals for corrective controls, including impacts to property
14 valuation, economy, and the official Management Program. The statute (K.S.A. 82a-1041) provides a
15 procedural structure for the development of LEMA management plans to be adopted by a GMD and
16 recommended to the Chief Engineer. When members come together to seek ways to extend supply and
17 reduce groundwater decline rates, the GMD3 Board fulfills its purposes under state and local policy to
18 represent member interests with respect to their water rights, use and supply in legal and administrative
19 proceedings or before political bodies. The Board has the authority to adopt a LEMA plan and seek
20 acceptance by the Chief Engineer, who must consider only the requested plan for implementation. A LEMA
21 plan recommended to the GMD3 Board by members may be adopted with corrective controls and may be in
22 conjunction with infrastructure development. Basic steps for establishing a GMD3 LEMA involve
23 formulation of a plan generally accepted by area members, presentation of the plan to the Board, Board
24 adoption of the plan, Board request for a LEMA to the Chief Engineer based on the plan, two prescribed
25 public hearings by the state considering the proposed plan, and a decision order of the Chief Engineer
26 approving, returning, or rejecting the LEMA. Previous work on a Kearny-Finney LEMA is available for
27 reference online [HERE](#).

28
29 Each LEMA plan proposed for GMD3 Board adoption shall include:

- 30
31 1) A clear groundwater management goal.
32 2) A basis for the proposed boundaries.
33 3) Evidence in a record of plan development that multiple alternatives were formulated for setting
34 corrective controls on member water rights, including use of the principle of prior appropriation.
35 4) Reasoning for the use or rejection of each alternative; and,
36 5) The recommended strategy for determining the will of the eligible voters of the District having
37 property rights within a proposed LEMA

1 **WCAs (Water Conservation Areas).** In 2015, the Legislature provided an additional GMA tool under the
2 KWA Act referred to as a WCA. A WCA is a water rights administration tool where any water right owner,
3 or group of owners can develop a water conservation plan for consideration and agreement of the Chief
4 Engineer, KDA/DWR. By law, a WCA plan is subject to all applicable rules and regulations and
5 management plans of the GMD. The purpose of a WCA is to encourage water conservation through
6 voluntary corrective controls. By order of the Chief Engineer, a WCA plan consent agreement may allow
7 new use authority reallocated from existing base water rights under certain conditions. Changing the diversion
8 pattern of water use in a local aquifer can alter the water supply of plan proponents and for other member
9 wells not included in the plan. New proposed pumping changes under a WCA plan can be carefully
10 evaluated using the GMD3 Well Drawdown Evaluation Guidelines to provide relevant information to help
11 avoid adding risk of critical well conditions to nearby non-participating member wells and help protect prior
12 conservation efforts. With the consent of all participating water right owners in a WCA, the Chief Engineer
13 may amend the agreement order to modify corrective controls, terminate the voluntary WCA, or make other
14 changes requested by the participating water right owner(s). Acceptable plans include provisions regarding the
15 proposed duration of the water conservation area and any process by which water right owners may request to
16 be added or removed from the water conservation area. Under the Management Program activities, GMD3
17 will review each WCA proposal, change of plans, or other proposed use change to inform the process and
18 provide recommendations. The GMD3 Board continues its request of Resolution 2017-2 for the needed rule
19 reform required by K.S.A. 82a-745(n). State WCA information is posted online [HERE](#).

20
21 **Managing water use by the drop.** Member management of small water wells requires use technology and
22 practices that apply water by the drop to maximize water value and sustain profitable agriculture. Field-scale
23 drip irrigation technology for agriculture and municipal applications in southwest Kansas are being used
24 more by necessity. This technology minimizes the water thief of direct evaporation during field irrigation. This
25 requires investments to adapt to project water plan goals. For example, one 15 gpm leak or preventable evaporation
26 loss during field irrigation equates to: 1 hour = 900 gallons, 1 day = 21,000 gallons, 1 month = 648,000
27 gallons and 4 months = 2,592,000 gallons. In perspective, that equates to 7.95 acre-foot or 95.5 acre-inches
28 of water. An example activity video is available online [HERE](#).



Activity Group B – Water Conservation Goals Summary

1. Assist members in evaluating and adapting their water use systems for wise use to address risk management needs with reliable information.
2. Develop annual conserve-to-preserve accounting tools with use guidelines.
3. Advise and assist KDHE in implementing the GE&P Act to benefit members and the aquifer.
4. Support Type (1) and encourage Type (2) water conservation.
5. Evaluate Master Water Manager pilot project to promote EMAWC activity.
6. Develop policy to advise “due consideration” of past conservation (K.S.A. 82a-744).
7. Protect and enhance surface water flow management infrastructure for Type (2) conservation.
8. Conduct MAR storage accounting of surface water and evaluate need for easements to use aquifer pore space in rock formations under private ownership.
9. Develop policy for additional wells in dividing property vs. supplemental wells that restore aquifer depletion rate and criteria for evaluation consistent with the Management Program.
10. Consider added policy on standby wells.
11. Participate in each IGUCA review or revision in the District.
12. Encourage LEMA plans from members that enhance supply with infrastructure development and agreeable corrective controls.
13. Encourage Type (2) water conservation corrective controls under critical well conditions.
14. Develop and update GMD3 conservation plan guidelines.
15. Update and apply well evaluation guidelines to reveal potential hardship or risk to members.
16. Promote charitable groundwater right donations.
17. Encourage policy development to allow conditional appropriation of waters otherwise lost to Kansas to store it for enhanced management activity.
18. Seek 2016 Legislative Session HB 2059 compromise language as an addition to the KWAA.
19. Develop testing and evaluation guidelines for additional wells in GMD3.
20. Explore alternatives to the Edwards Protocol for treating ANS in source water.

ACTIVITY GROUP C – MODELS, RESEARCH AND DEVELOPMENT

Groundwater management requires specialized model tools. Models of District groundwater reservoirs, well pumping drawdown estimate, surface water resources, and cost benefit analysis are necessary tools that provide up-to-date information critical to the success of the official Management Program. Each model is a tool designed to represent a simplified version of reality. The reliability of the model tool depends on how well the model approximates field conditions. Some extreme events or conditions may be beyond the calibration of a model. To build trust, GMD3 will encourage use of consistent and verifiable data with shared models and properly applied analytical tools: Standard issue software; Standard issue data (KGS, USGS, etc.); Coordination with partners and referees; Common set of facts and tools (Foster’s relationships, Fundamental to negotiations); and collaboration to improve tools.



GMD3 Groundwater Model Update. A two-year update of the GMD3 area OHP Aquifer model has been completed in 2024 in a funding partnership with KWO and KGS expertise. The model area covers over 5 million acres in southwest Kansas. This model will assist the District and others in evaluation of project proposals and options to conserve, extend and restore the District aquifers scenarios that include enhanced aquifer recharge will be evaluated. A new Geographical User Interface tool was added that allows greater access to the model using graphical icons and audio indicator such as primary notation, instead of text-based

1 user interfaces, typed command labels or text navigation. Additional data may be needed for improving the
2 model function and utility, especially for the evaluation of potential water imported for MAR activity.
3

4 **Groundwater data.** Groundwater levels in southwest Kansas have been on the decline since unregulated
5 water use rapidly increased in the mid-20th century. The KGS and DWR currently measure groundwater
6 levels in December, January, and February to avoid, as much as possible, data from short-term declines
7 caused by widespread pumping during the growing season. Historical annual data for each well measured
8 are available online at the KGS website [HERE](#). This information is exchanged and shared along with other
9 data and measurements secured by GMD3 to provide the best possible models and information for member
10 water managers and decision makers. This information may include, but is not limited to, member test hole
11 data contributions, flowmeter and well yield tests, recharge rates and pumping drawdown information and
12 other related studies conducted within the District area or affecting District water supply.
13

14 **Imports, Economy and water valuation models.** Economic and water related valuation models are a
15 critical source of information used to advise and assist the Board, water managers in their water project and
16 conservation investments. A public interest of the legislature for water appropriation is that the highest
17 public benefit and maximum economical development may result from the use of Kansas water (K.S.A. 82a-
18 711). All values and costs should be included when valuing water because they exist in every water
19 transaction seeking to use or to refrain from using water. A transfer of available water across Kansas would
20 add value and public benefits identified and quantified to help solve the supply decline gap for the GMD3
21 area and possibly for other western partners across Kansas and beyond. GMD3 will take a leadership role
22 with partner agencies and organizations to examine various water transfer and recharge project scenarios
23 with productivity and wealth benefit models to identify preferred projects under future water capitol to meet
24 future resource service needs.
25

26 **Water exports.** The Board shall inventory and involve itself with direct exportation of water supply in the
27 District to ensure that all Management Program purposes support present and future water supply needs.
28 Exported water use may be evaluated to consider net benefits between imported supplies and those exported
29 out of the District to other states.
30

31 **Federal Farm Programs.** Farm Bill research and other programs provide significant support for home-
32 grown water plans and the GMD3 Management Program. Using historic water project data without
33 accounting for conserve-to-preserve activity can work against conservation program purposes by creating
34 incentives to maximum water use prior to enrollment. Those who already steward Type (2) groundwater
35 conservation for their declining supply have a greater burden to achieve more conservation that should be
36 properly valued in addressing resource concerns. GMD3 will advocate for flexibility in the use of protected
37 field level data to encourage water conservation over program elements that economically force members to
38 high water use.
39

40 **Data collection and exchange.** GMD3 collects data regularly for use in addressing water quantity and
41 quality concerns. Land ownership records and socioeconomic and use value studies are considered as
42 necessary to implement the groundwater Management Program and Board initiatives. District datasets will
43 be exchanged with water management partners to support mutual resource concerns. Such cooperative
44 efforts will assure an efficient use of GMD3 manpower, technical, and financial resources.

1 **Research and development of water conservation incentive programs.** GMD3 will continue
2 to encourage and develop additional partners in water conservation incentive activities
3 made available to members. GMD3 will investigate opportunities to leverage Management
4 Program activities with incentivized conservation activities for District members.
5

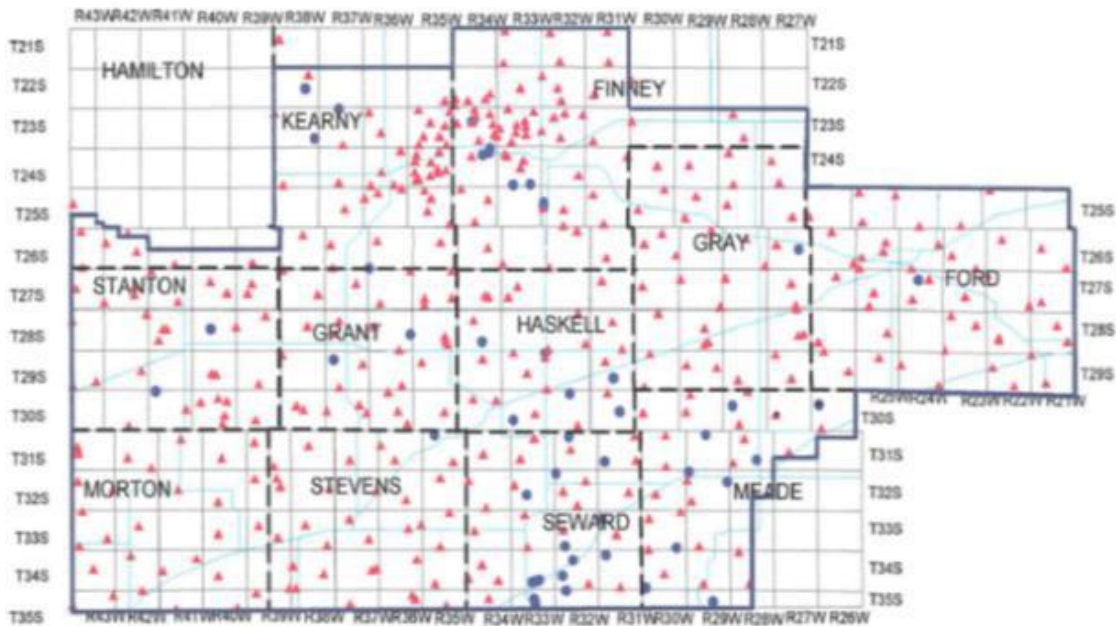
6 **Activity Group C - Models, Research & Development Goals Summary**

- 7 **1.** Update and maintain the GMD3 OHP Aquifer groundwater model with a GUI tool.
- 8 **2.** Support partner R&D to help members evaluate opportunities in local renewable-energy to power flexibly
9 scheduled water treatment and ammonia fertilizer production.
- 10 **3.** Work with partners to provide water use feedback and water conservation reporting.
- 11 **4.** Collect additional data on hydrology, member test holes, index wells and water conservation.
- 12 **5.** Develop and update economic models and other economic water value assessment tools.
- 13 **6.** Research Water marketing and transfer projects for conservation and importation of supply.
- 14 **7.** Develop practical programs that advise and assist members to optimize their wise water use.

15 **ACTIVITY GROUP D – WATER QUALITY PROTECTION**



16
17
18
19 **Water Quality.** Water quality is basically the amount and type of material in the water.
20 GMD3 authority to conduct water quality protection activities are included in the District
21 Powers section on page 5. Water quality and quantity are interrelated and inseparable elements of water
22 supply. They are viewed as two sides of the same water supply coin. Water quality affects water usability
23 and the public health, safety, and welfare of Kansas citizens, including members of GMD3. GMD3 will
24 advise and assist partners to ensure the water quality protection needs of the area are addressed. GMD3 has a
25 history of groundwater quality data collection in a network of annual sample collection, analysis, and
26 reporting.
27



28
29 **Figure 6. General map of GMD3 water quality sampling network.**

1 **The Kansas Department of Health and Environment, Bureau of Water (BOW)**, is a key state partner
2 among numerous other local, state, and federal partners, to protect the usability of the District water supply.
3 Kansas has developed a general Water Quality Management (WQM) plan linked [HERE](#) to achieve the
4 objectives of the Kansas Water Plan (KWP) and to maintain state primacy for administration of federal law
5 and water quality programs. Kansas controls its own water, but federal compacts and environmental laws
6 have an impact. Examples include:

- 7 - **The Clean Water Act**, which regulates water quality by regulating discharges to waters of the US (also
8 known as **WOTUS** or Navigable Streams). Programs and provisions include National Pollution
9 Discharge Elimination System (**NPDES**) permits, which govern discharges into surface water from
10 specific sources and indirect discharges through storm-water runoff (standards – swimmable/fishable,
11 Section 303d & Total Maximum Daily Loads); Section 404 Permits, which address wetlands activity;
12 and Section 319 to control Non-Point Source (NPS) pollution.
- 13 - **The Safe Drinking Water Act**, which regulates water quality in public water systems.
- 14 - **The Endangered Species Act** protects species of plants and animals designated as threatened or
15 endangered by the U.S. Fish and Wildlife Service. This involves formal listing, defining critical habitat, and
16 devising a recovery plan.
- 17 - **River Basin Compacts**, which equitably divide explicit elements of the waters of the Arkansas and
18 Cimarron rivers as federal law.

19 GMD3 advocates at all levels to preserve state rights of primacy to groundwater management activities, and
20 will monitor, implement, and address water quality activities in coordination with partners to advise and
21 assist them in fulfillment of the District official Management Program.
22

23 **Existing pollution problems.** Known pollution problems that pose a direct threat to the usability of
24 groundwater supply within the District will be researched and evaluated by staff, in conjunction with KDHE
25 Bureau Of Water (KDHE/BOW) programs and/or other partners to seek adequate mitigation and/or
26 remediation for improving and protecting supply conditions. Where identified concerns exist, staff will
27 present its recommendations to the Board for consideration of advisable action.
28

29 **Contamination risk.** The water quality protection activity of GMD3 will advise and assist members,
30 partners, and business interests to identify the major sources of water usability depletion and address
31 concerns in targeted areas to minimize water risk from contamination of District water supply. A practical
32 state resource for careful land use considerations can be referenced online [HERE](#). Public Notice Concerning
33 Kansas / Federal Water Pollution Control Permits and Applications are reviewed by GMD3 and reviewed to
34 monitor and coordinate water quality permitting with water appropriation permitting and inform members
35 and partners on matters concerning the Management Program. Notices are available online at the
36 KDHE/BOW website [HERE](#). Practical assistance to members and industry will harmonize actual conditions
37 with enforceable water policies. The special saltwater intrusion rule in Seward and Meade Counties is an
38 example of subsurface well construction policy to protect water supply. Added evaluation of Permian
39 saltwater data will allow for an update of rules in the chloride management area. Management program
40 activities will support drinking water quality monitoring and supply protection with guidelines for triggering
41 events like drinking water well inspection and for water quality data collection and education.
42

43 **Oil and gas industry water use and supply risk.** GMD3 should consider a review of data on historical oil
44 and gas activity in the District for review of information with appropriate state officials to screen for
45 orphaned industry wells and potential for inter-aquifer groundwater connection that can create freshwater
46 drains to deeper, less fresh formations. Opportunities for new technology-based water treatment will be
47 evaluated with assistance from partners.

1 **The Local Environmental Protection Program (LEPP).** Established by the state in 1990, local authorities
2 were assisted by GMD3 in developing a local group (LEPG) with county water protection plans that
3 complemented other water quality efforts being waged by local, state, and federal agencies. Focus for each
4 environmental protection plan was adoption and enforcement of county environmental codes with an
5 emphasis on onsite wastewater systems and private water wells. GMD3 will continue to provide advice and
6 assistance to program partners with available resources to local county water protection programs. More
7 information is posted [HERE](#).

8
9 **Abandoned water wells and test holes.** With about 1/4th of non-domestic wells sitting idle each year,
10 GMD3 will assist the KDHE/BOW in their implementation of the Groundwater Exploration and Protection
11 Act and the disposition of temporarily abandoned water wells to assist members in their management of
12 wells and boreholes. GMD3 will advise and assist members to manage well equities, groundwater quality,
13 monitoring well data collection opportunities and on-site water supply and safety concerns.

14
15 **Groundwater gage network.** GMD3 will continue to develop a District monitoring well network and
16 obtain water samples to be analyzed for water usability depletion. GMD3 continues work to set up a network
17 of observation wells in areas where additional data is needed to support the Management Program and water
18 risk concerns.

19
20 **Uranium, Radium and Radon.** These elements are not normally evaluated in regular domestic drinking
21 water samples but can pose a health risk. According to the KGS, radon and its immediate parent radium
22 largely occur where uranium is present in rocks, soil, or ground water. All rocks contain small amounts of
23 uranium. Uranium can also be present as a solid attached to mineral coatings on sand and silt. Uranium is
24 very soluble and easily weathered into solution - like dissolved salt or sugar. Some groundwater in the
25 District is known to have naturally occurring uranium and radium. Where these occur, close cousin Radon
26 may also occur (Felmlee and Cadigan, 1979). More information is available from KGS online [HERE](#).

27 28 **Activity Group D - Water Quality Protection Goals Summary**

- 29 **1.** Assist KDHE bureau of Water in a review and any needed revision of surface water quality
30 standards that will guide authorization of source water use for aquifer recharge activity.
- 31 **2.** Assist and advise KDHE bureau of water in governance of injection & other wells, public
32 water supplies, permitting & compliance input, and watershed management benefits
33 consistent with the Management Program.
- 34 **3.** Evaluate low-cost water treatment technologies for reuse of low-quality water sources for
35 potential agriculture supply and other value benefits.
- 36 **4.** Evaluate the extent of old well drainage down unsealed deep wells from upper fresh aquifers
37 into deep brackish formations, working with KCC, KGS and other partners.
- 38 **5.** Support efforts of county sanitarians to protect drinking water supply sources.
- 39 **6.** Identify appropriate sanctions for unlicensed and unlawful well construction and use.
- 40 **7.** Evaluate the needs of District members to access water quality data to manage the safety of
41 drinking water wells.
- 42 **8.** Support the KGS mineralization study and model the contamination results for remediation.
- 43 **9.** Reduce and mitigate District aquifer contamination from tons of uranium and other minerals
44 delivered by Ark River flows from Colorado into SW Kansa aquifers.
- 45 **10.** Evaluate Permian saltwater data to update policy in the chloride management area.

ACTIVITY GROUP E – ARK RIVER MANAGEMENT



The Arkansas (Ark) River is the principal source of surface water flow into the District and the area groundwater reservoirs. Authorities for GMD3 Ark River Management activities are include without limit in the District Powers section on page 5. Managing recharge sources for the declining aquifer system makes this Management activity a necessary part of the official Management Program for constituents. All aspects of the Ark River resource are involved and intended to **Reduce Uncertainty and Increase Resiliency** of the river infrastructure to:

- 1) Develop safe and stable river system operations,
- 2) Provide opportunities for improved collaboration,
- 3) Balance upstream and downstream risks,
- 4) Acknowledge shared resources/responsibilities, and
- 5) Respond cooperatively to change and crises.

The Ark River flows from upstream snow melt, runoff events, aquifer discharge and releases from reservoir storage. Since the 1970s, mining of groundwater near the Ark River in Kansas has lowered the water table, creating a losing stream over the OHP Aquifer. All river flows are now either consumed directly for irrigation or stored indirectly as flow losses to the river alluvial aquifer and connected OHP Aquifer. This river system effectively functions as a terminal basin groundwater reservoir that receives what is left over from upstream use and delivery activity associated with interstate compact.

Ark River Basin change. The Ark River basin of the District that is shared with Hamilton County, Kansas, and areas in the state of Colorado has changed significantly since before the formation of GMD3. Construction of upstream reservoir storage, river flow exchanges, water transfers, re-regulation of river flows, direct diversion improvements, groundwater well development, land use changes and water use efficiency improvements have all contributed to a profound change in the nature of basin water resources. Local management activity is needed to preserve and improve the groundwater benefits of the river infrastructure and flow of water supply. For example, the distribution of recharge benefit from river flow is impaired by a riverbank breach between Garden City and Holcomb. Aquifer recharge is an amenity of river flow. Ark River management activity will address the groundwater concerns of available river flows and serve as a model for managed aquifer recharge in other basins in southwest Kansas.

Figure 7. Ark River breach in state riverbank property upstream of Garden City.



1 **Managed Aquifer Recharge (MAR).** Early experiments near Lakin, Kansas and elsewhere in the 70s from
2 interest to develop feasible methods of artificially recharging area groundwater reservoirs (Bulletin 20, Ks.
3 Water Resources Board, 1977). Those studies concluded that utilization of surface runoff or imported water
4 to recharge by water-spreading techniques would be improved if more water were made available. Natural
5 replenishment estimates away from stream channels are low, typically less than one inch of water annually.
6 Recharge rates may be higher locally, such as beneath river and ditch flows, fully irrigated land and through
7 sandy soils. Aquifer recharge is an amenity of river and stream flow with natural and managed groundwater
8 recharge benefits. A GMD3 Systems Optimization Review WaterSMART project along the Upper Arkansas
9 River in 2014 provided river channel loss rates that are also useful MAR or well augmentation rates.
10 Opportunities exist to enhance MAR activities by enhancing source water management and adding water
11 imports with constructed transfer infrastructure that is distributive and regenerative my design. A MAR
12 report is posted [HERE](#).

13
14 **GMD3 Upper Ark GMA.** The portion of the basin above Garden City to the Colorado and Kansas Stateline
15 that include the IGUCA, ditch service areas and tributary underflow affecting supply, including the
16 Hamilton County paleo river channel tributary underflow, are considered relative to the GMD3 Upper Ark
17 GMA for the purposes of the Management Program. The river flow and associated recharge benefits
18 generally occur year-round to a point above Garden City. The problems of dwindling distribution of flows,
19 river sediment accumulation and water usability depletion are priority concerns in the GMD3 Upper Ark
20 GMA. For watershed group development and management purposes, the national Hydrologic Unit Code
21 (HUC) for the GMD3 Upper Ark GMA is HUC 11030001 (Middle Arkansas-Lake McKinney). Part of this
22 HUC area is tributary river corridor area upstream in Hamilton County and currently outside the District
23 management area. Significant financial resources have been applied in recent years to this area from GMD3
24 as an area affected by the Compact and an area recommended by the original Arkansas River IGUCA
25 advisory committee for inclusion into the District management area.

26
27 **Public drinking water.** All public drinking source water is from groundwater. Within GMD3 portion of the
28 Ark River basin, the cities of Lakin, Deerfield, Holcomb and Garden City have experienced a decline in
29 groundwater quality from some wells due to infiltration of river water near city well fields. The City of
30 Lakin is a member that recently constructed a nanofiltration water treatment facility at great local expense to
31 get their drinking water within the Environmental Protection Agency’s (EPA) maximum contaminant level
32 (MCL) for uranium. The community must now bear an ongoing water usability depletion cost of millions of
33 dollars and 15% loss of supply necessary for deep injection waste disposal. The water extracted from the
34 Deerfield and Holcomb wellfields has been within safe drinking water standards, but quality has been
35 deteriorating. Those cities must develop additional freshwater sources and treatment solutions, including
36 potential reuse. GMD3 works to aid Disadvantaged or Underserved Communities identified on the Climate
37 and Economic Justice Screening Tool (E.O. 14008, 2023) and grant opportunities for no match funding
38 from the US Department of Interior to improve or restore water supply reliability threatened by water
39 quality or quantity depletion.

40
41 **Water quality.** Arkansas River basin OHP Aquifer lateral flow into Kansas and GMD3 as a shared
42 interstate aquifer is generally of good quality. However, water entering the state as Arkansas River Stateline
43 flow has seen high contaminate levels from a few elements that include sulfate salinity and uranium. High
44 radio nuclei levels have a significant effect on water treatment costs to restore water usability for public
45 water supply and other uses. Estimates from the Kansas Geological Survey of the weight of uranium coming
46 into Kansas annually from Colorado via the Arkansas River are concerning, indicating near 10 tons
47 delivered to Kansas each of 2015 through 2019.

1 Table 4. Mean annual flow and uranium concentration and annual uranium load for 2012–2021 for the
 2 Arkansas River near the Colorado-Kansas state line.
 3

Year	Mean annual Sp.C., $\mu\text{S/cm}$	Mean annual uranium concentration, $\mu\text{g/L}$	Mean annual flow, ft^3/sec	Annual uranium load, metric ton/yr	Annual uranium load, ton/yr
2012	4,271	72.5	28.7	1.79	1.97
2013	4,395	75.3	26.9	1.60	1.77
2014	3,813	62.4	92.1	3.76	4.14
2015	3,230	50.0	196.1	6.02	6.64
2016	3,285	51.2	201.5	7.47	8.23
2017	3,324	52.0	234.6	9.09	10.02
2018	3,409	53.8	206.6	8.41	9.27
2019	3,401	53.6	186.2	7.44	8.20
2020	3,641	58.7	106.9	4.82	5.32
2021	3,564	57.0	91.9	3.90	4.30

4 (See D. Whittemore, KGS Open-File Report 2023-21, linked [HERE](#))
 5

6 **Groundwater contamination depletes water usability.** The contaminants in the Arkansas River water
 7 coming into the District diminishes the utility of the closed basin groundwater as contaminant levels add
 8 water usability depletion of native groundwater as a problem that must be treated at significant cost to local
 9 water users. Local irrigators who rely on surface water from river flows must run water through plastic pipes
 10 beneath their steel pivot systems because the saline river water is highly corrosive and will collapse a
 11 galvanized steel pipe within a single growing season. Higher volumes of river water must be used for
 12 irrigation than would otherwise be the case if the water was less saline. In many cases, producers must either
 13 blend or run groundwater onto their fields after applying the river water to mitigate the mineralization
 14 effects, which further degrades the high Plains Aquifer supply.
 15

16 **Federal Reclamation assistance.** GMD3 requested assistance from the US
 17 Department of Interior, Bureau of Reclamation (Reclamation) and Kansas
 18 Water Office to evaluate public water source options along the river above
 19 Garden City to mitigate deteriorating water quality and declining aquifer
 20 levels while assuring safe public drinking water supply. The 2014 study
 21 included the cities of Coolidge, Syracuse, Kendall, Lakin, Deerfield, and
 22 Holcomb to identify possible solutions, including construction of new
 23 facilities, infrastructure, and collaboration efforts. The 2014 study identified
 24 local options for future public drinking water supply and added study.



GMD3 collects bulk water quality samples for testing by researchers with the US Dept. of Interior who are attempting to help GMD3 find economical ways to restore usability of the very poor-quality river water in the watershed.



1 **2019 Session Resolutions SR1729 and HR6018.** GMD3 attempted to partner with Reclamation and state
2 officials in Kansas and Colorado for a basin Plan of Study to collaboratively address the poor-
3 quality water received down the shared river basin. Public meetings were held in Kansas and
4 Colorado, but participation was low. GMD3 worked with the legislature on SR1729 and HR6018
5 request for federal aid and cooperation to address water quality issues in the shared Arkansas
6 River Basin and for state and local partners in both states to cooperate in addressing the
7 prevalence of radionuclides in the waters of the Arkansas River Basin. In response, the KWO,
8 KDHE and KDA worked together with the KGS and GMD3 in a multi-year Mineralization
9 Study, with free drinking water testing provided to participating well owners. GMD3 continues
10 this work collecting water samples and encouraging further study and collaboration for interstate
11 basin water usability improvements.

12
13 **Interstate Compact.** The Kansas-Colorado Arkansas River Compact (Compact) was negotiated
14 in 1948 between the States of Kansas and Colorado. Article I provides its purposes:

15 *Settle existing disputes and remove causes of future controversy between the states of Colorado*
16 *and Kansas, and between citizens of one and citizens of the other state, concerning the waters of the*
17 *Arkansas River and their control, conservation and utilization for irrigation and other beneficial*
18 *purposes.*

19
20 *Equitably divide and apportion between the states of Colorado and Kansas the waters of the*
21 *Arkansas River and their utilization as well as the benefits arising from the construction, operation*
22 *and maintenance by the United States of John Martin Reservoir Project for water conservation*
23 *purposes.*

24
25 The Compact does not allocate specific quantities of water to each state, but rather provides for maximum
26 release rates for each State from the conservation pool of John Martin Reservoir (JMR). A provision of the
27 Compact requires releases from JMR storage be applied directly to beneficial use, without storage after
28 release. The reservoir is located approximately 60 miles west of the Stateline and has an available capacity
29 for irrigation water supply of approximately 338,000 ac-ft. JMR has an effective priority date in Colorado of
30 1948, though the Compact operations are not subject to Colorado Water Court Decree as the Compact is
31 both state and federal law. Additionally, the Arkansas River Compact Administration (ARCA) operates the
32 Compact to apportion water allocations, investigate concerns and develop interstate agreements as
33 resolutions. Resolutions include those concerning an operating plan for John Martin Reservoir (1980
34 agreement), as amendments, which establish separate accounts in JMR for users in Colorado and for Kansas, along
35 with related operating provisions affecting basin water use as a temporary agreement. Additional operating
36 accounts are regularly considered for system efficiency improvements that require careful study and
37 decision by ARCA to protect the federal apportionment to each state and affecting the Quality and Quantity
38 of the water resources of the District.

39 **Western Water Conservation Projects Fund.** The KS v. CO original action no. 105 cash damage award to
40 Kansas, after reimbursing the state for cost to litigate, was split 1/3 to the State Water Plan Fund (SWPF)
41 and 2/3 to the Water Conservation Projects Fund (WCPF) for use in the area affected by the compact
42 violations. The statewide Water Plan portion was used primarily as state cash cost share funding to create
43 the Kansas Conservation Reserve Enhancement Program (CREP) under state contract with USDA.
44 However, several state legislative budget cycles resulted in removal of most of those damage funds from the
45 Kansas CREP activity and general fund budget allocations are relied on for the needed state finds.

1 **Local Legendary leadership.** Irrigation ditch companies and surface water user organizations have
2 operated since the 1800s and continue to provide resource leadership. The 2008 Kansas Legislature
3 provided for GMD3 to administer the WCPF and assure those public funds would be preserved from
4 legislative budget sweeps for the intended purposes and created an efficient model program to accomplish
5 the purposes of the WCPF. This also allowed the investment interest on the principal fund to accrue to those
6 purposes under the fiduciary care of GMD3 and to leverage the fund with other grant opportunities. The
7 WCPF became the Western Water Conservation Projects (WWCP) Fund with project goals to do the
8 following:

9
10 *Maximize general public good (public interest); Maximize efficiency of call water for ditch irrigation*
11 *(low transit losses); Maximize benefits of high river flows to improve recharge; Mitigate water quality*
12 *problems in surface and groundwater; Reduce consumptive use of water to help stabilize the system;*
13 *Improve the stability of the hydrologic system for irrigators; and Address compact compliance.*

14
15 Projects must be located in the area impacted by the Arkansas River Compact and meet eligibility
16 requirements and goals in K.S.A. 82a-1803, Kansas Legislative Session 2008 Senate Bill 534 and a KWO
17 Grant Agreement. An annual audit and report to the legislature is provided by GMD3. [The 2024 GMD3](#)
18 [Legislative Report is posted online.](#)

19
20 **River navigability for title and GMD3 Management Program activity.** As a navigable river, the bed of
21 the Arkansas River from the Colorado state line to the Oklahoma state line is property of the state. The
22 extent of the riverbed extends to the ordinary high-water mark at the time of statehood. Over time, due to
23 accretion, avulsion, floods, natural and man-made changes to the landscape, and the over-utilization of water
24 supplies in Colorado and Southwest Kansas, it has become difficult to determine property lines. The
25 problem is further compounded by non-uniform descriptions on deeds, different taxing practices among
26 counties, the use of state-owned land by private and public parties and lack of a single state agency being
27 appointed authority to actively manage riverbeds. This all leads to confusion about property lines and use
28 practices that hinder the orderly development of both state and private property, including development and
29 use of water rights on state property. GMD3 acknowledges that all parties would be well served by the
30 establishment of a uniform method for determining the ordinary high-water mark at the time of statehood
31 and that following a compatible administrative boundary determination system would allow for cooperative
32 and comprehensive planning to further develop the beneficial use of state-owned natural infrastructure.
33 GMD3 is committed to providing resources and assistance to other state and local government and NGO
34 partners to address this issue in a cooperative comprehensive manner.

35
36 **Upper Arkansas Watershed Group.** GMD3 participated in Upper Ark River Water Quality Tours in
37 2005 hosted by K-State research and the activity that followed. GMD3 will continue to provide leadership in
38 further development and protection of the natural water infrastructure of the Ark River consistent with the
39 purposes of the GMD Act and the advice of advisory groups like the newly formed Upper Arkansas
40 Watershed Group. A multi-year federal Reclamation WaterSMART grant was awarded to GMD3 in 2021 to
41 fulfill this activity of the Management Program. Water quantity and quality are a priority concern in this part
42 of the river basin. The Kansas High Priority TMDL areas be accessed [HERE](#) for reference.

43
44 **GMD3 Lower Ark GMA.** The river reaches below Garden City and adjacent areas of the IGUCA
45 tributary groundwater recharge is considered the GMD3 lower Ark GMA. Groundwater development and
46 loss of surface inflows to the GMD3 Lower Ark GMA made it necessary to apply targeted groundwater
47 management activities immediately upon the formation of GMD3 to limit additional appropriations and
48 address flow intercept and water distribution issues associated with locating and relocating of wells closer to

1 the river channel. Over time, the GMD3 Lower Ark GMA has lost base flow and seasonal flushing flows
2 from upstream spring snow melt and runoff events. Rivers and their connected aquifers are natural MAR
3 infrastructure and supper highways for groundwater recharge. The lack of regular river flow creates similar
4 land ownership, MAR, and flood control issues as in the GMD3 Upper Ark GMA. GMD3 will apply
5 management activity to the natural infrastructure and available river flows to protect, distribute, and
6 replenish underground reservoir storage inflows and evaluate other water sources that add ecological and
7 MAR benefits while reducing flood risk in other areas.

8
9 **Pre-compact water rights and MAR.** There are vested rights (pre-1945) and pre-compact (pre-1949) water
10 rights in the portion of the Arkansas River IGUCA between Garden City and Dodge City that have water
11 rights to a cumulative rate of diversion of more than 200 cubic feet per second (cfs). Large river flows are
12 rare across the GMD3 Lower Ark River GMA since the interstate compact was ratified by congress. In
13 actions to meet reasonable needs during improved river conditions below the Garden City gage, state
14 permitting has historically authorized up to an additional acre foot per acre for existing surface water ditch
15 company acreage in the GMD3 Upper Ark GMA without an exceedance of the total authorized amount of
16 all vested water rights of irrigation ditch companies under river flow conditions where 200 cfs average daily
17 flow is measured at Garden City with continuous river flow measured to the Dodge City river gage. Existing
18 vested rights and pre-compact water rights in the GMD3 lower Ark GMA authorize over 200 cfs of water
19 use. Records indicate the GMD3 Ark river system can inflow to groundwater storage about 200,000 acre-
20 feet per month across the District. GMD3 recommends vigilance to preserve and continuing this practice to
21 protect MAR benefits and mitigate poor quality water in the ditch service areas and across the GMD3 upper
22 and lower Ark GMA.

23
24 **Ark River IGUCA review and revision.** Several modifications to the first IGUCA order by the Chief
25 Engineer have occurred after the GMD3 request, hearing process and IGUCA Task Force recommendations
26 without public process or GMD3 consultation. GMD3 will advise and assist each proceeding, review, or
27 update of the Ark River IGUCA in support of the public interest of the GMD Act and official Management
28 Program and its designation under session 2023 HB 2279 as a high priority groundwater area with action
29 plan to be regularly update. The Arkansas River IGUCA order of the Chief Engineer applies unique
30 limitations on one year term permits and where wells hydraulically connected to the river channel may not
31 relocate closer to the center of the river channel by more than 10%. An updated review schedule may be
32 developed assure the area action plan meets the needs of water right owners and the public interest of the
33 official Management Program.

34 **Activity Group E - Ark River Management Goals Summary**

- 35 **1.** Seek federal other partner assistance to augment Arkansas River basin supply shortages and
36 mitigate usability depletion from contaminated river inflows into GMD3.
- 37 **2.** Assure a distribution of MAR benefits will continue to supply pre-compact water rights in
38 the GMD3 Lower Ark GMA and monitor upstream water usability depletions.
- 39 **3.** Propose update river management boundaries.
- 40 **4.** Conduct MAR/well augmentation in both GMD3 Ark River GMAs.
- 41 **5.** Seek funding for river projects to extend the GMD3 WWCP Fund activities.
- 42 **6.** Enhance existing natural and constructed surface water infrastructure use value.
- 43 **7.** Evaluate ongoing Colorado Stateline groundwater development and any effects on supply.
- 44 **8.** Develop Proof-of-Concept projects that include MAR activity and needed rule reform.
- 45 **9.** Recommend permitting for strip aggregate mining to mitigate river fill and floodway risks.
- 46 **10.** Fulfill the 2019 session SR1729 and HR6018 resolutions to improve water quality.
- 47

ACTIVITY GROUP F – OUTREACH, ADVOCACY, AND EDUCATION



Southwest Kansas Runs on Water. GMD3 will implement strategies and actions for increasing awareness of District groundwater governance, water resources and management activities to inform, advise and assist the public, members, state and federal Water officials, the Governor, Kansas Legislature and Congress in a meaningful understanding of, and funding support for, the official groundwater Management Program for the area. Authority to conduct this Outreach, Advocacy and Education activity is included in the District Powers section on page 5. Working with diverse local, state, and federal interests, institutions and authorities requires significant coordination and outreach activity to secure the necessary productive partnerships implementing the Management Program. These activities will inform, shape, and influence public policy and legislation in support of the local management methods and funding of the Management Program with cooperation from other local, state and federal program activities that align with the GMD3 mission. GMD3 will actively engage youth, water managers, young professionals, and potential partners through original initiatives and cooperative activities with a goal of reaching and engaging all generations of water users.

KWO/KWA partners. GMD3 regularly works to exchange information and partner with KWO/KWA in water management tools, programs, or project funding. The primary function of the KWO under the Kansas Water Planning (KWP) Act is to develop and coordinate implementation of [the State Water Plan](#), which is generally updated every five years (K.S.A. 82a-903). The Legislature makes appropriations from the State Water Plan Fund where about 12 % of the fee fund comes from SW Kansas. GMD3 participates in the public process in support of the KWO and KWA Water Plan Fund budgeting activities and the activities of the legislature to help fulfill state policy for groundwater management and state water planning looking ahead at least 25 years. State assistance in planning the future of water supply for SW Kansas is considered vital for anticipating water availability across Kansas and in the semiarid areas of GMD3 as groundwater extraction and resource stresses intensify. GMD3 will advise all in the official Management Program to benefit constituents in the Upper Arkansas and Cimarron Regional Planning Areas and other areas.

Activity Group F - Outreach, Advocacy, and Education Goals Summary

1. Develop On-site project signage, resource education stations, & public water awareness.
2. Provide a platform for those who are using less water than their peers to share their methods.
3. Coordinate with partners to update the long-term goals and objectives of the legislature for state water planning to better reflect elements of the official Management Program in GMD3.
4. Continue to support state Water Plan funding from a 1/10 cent sales tax dedicated source to help fund GMD3 Management Program activities.
5. Encourage a state Water Plan budgeting process that considers the official Management Program and looking ahead 25 years.
6. Develop SW Kansas water conservation plan guidelines and conserve-to-preserve accounting tools to aid in communicating the Management Program activities.
7. Study access to floodwater for Flood-MAR storage to mitigate District water supply risks.
8. Provide annual reports to ARCA and the Kansas – Oklahoma Arkansas River Commission.
9. Report annually to state legislative budget and water committees.
10. Assure member interests are represented in state and federal water research coordination.
11. Advocate for the appointment of qualified members to state water leadership positions on related boards, authorities, associations, and compact administrations and support them in their role.
12. Participate in regional and national water organizations to learn, build partnerships, and represent the interests of the GMD3 constituency.