Kern Groundwater Authority

August 28, 2019

Public Review

KGA Groundwater Sustainability Plan

Public Review Period

- **Comments will be accepted through November 28, 2019.**
- **The KGA Umbrella includes:**
  - **KGA Umbrella – Summary roll-up of all management area plans**
  - **Management Area Plans (member agency GSPs)**

- **How to provide comments**
  - **For KGA Umbrella & Management Area Plans**
    - **Mail comments to: KGA 1800 30th Street, Ste 280, Bakersfield 93301**
    - **Email comments to: ppoire@kerngwa.com**
  - **Management Area Plans**
    - **District Websites**

Public Review Period

- Communication and outreach with stakeholders for GSP input.
- Outreach accomplished at many levels:
  - KGA Board meetings, stakeholder meeting and public workshops
  - Targeted community outreach meetings
  - Subbasin level GSA open house events
  - Member Agency outreach efforts
- KGA Umbella is draft document and will be revised based on input:
  - Collaboration to improve monitoring protocols and network
  - Revisions to implementation plans at the management area level
- KGA supports collaborative efforts and internal coordination to achieve sustainable management for the Subbasin shared groundwater resources

KGA Coverage of the Subbasin

- ***GSAs in the Subbasin***

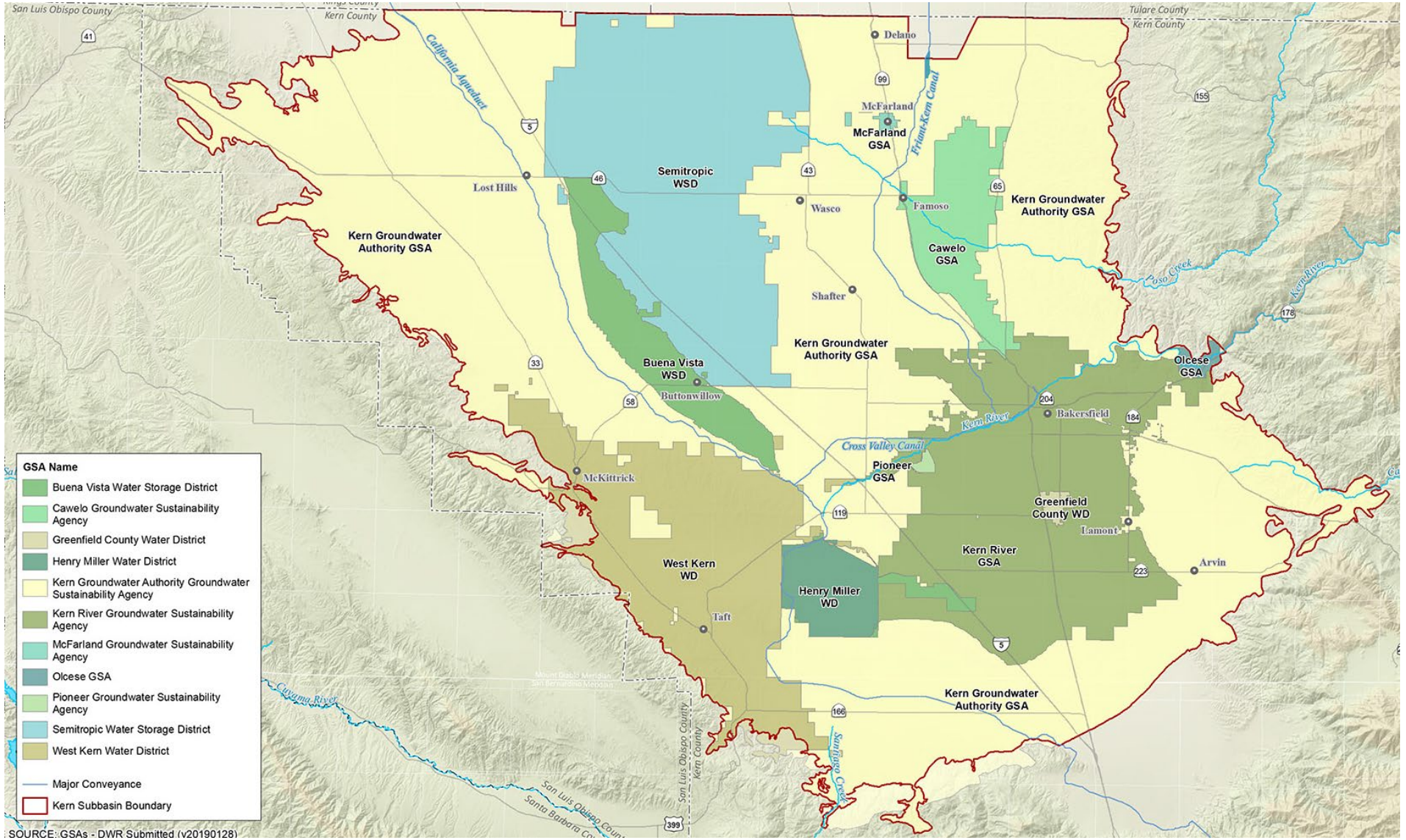
GSA Name	Independent GSP	GSP Name
Buena Vista Water Storage District	Yes	BVGSA GSP
Henry Miller Water District	Yes	HMWD GSA GSP
Cawelo Groundwater Sustainability Agency	No	KGA GSP
Kern Groundwater Authority	Yes	KGA GSP
McFarland Groundwater Sustainability Agency	No	KGA GSP
Pioneer Groundwater Sustainability Agency	No	KGA GSP
Semitropic Water Storage District	No	KGA GSP
West Kern Water District	No	KGA GSP
Greenfield County Water District	No	KRGSA GSP
Kern River Groundwater Sustainability Agency	Yes	KRGSA GSP
Olcese GSA	Yes	OGSA GSP

KGA Coverage of the Subbasin

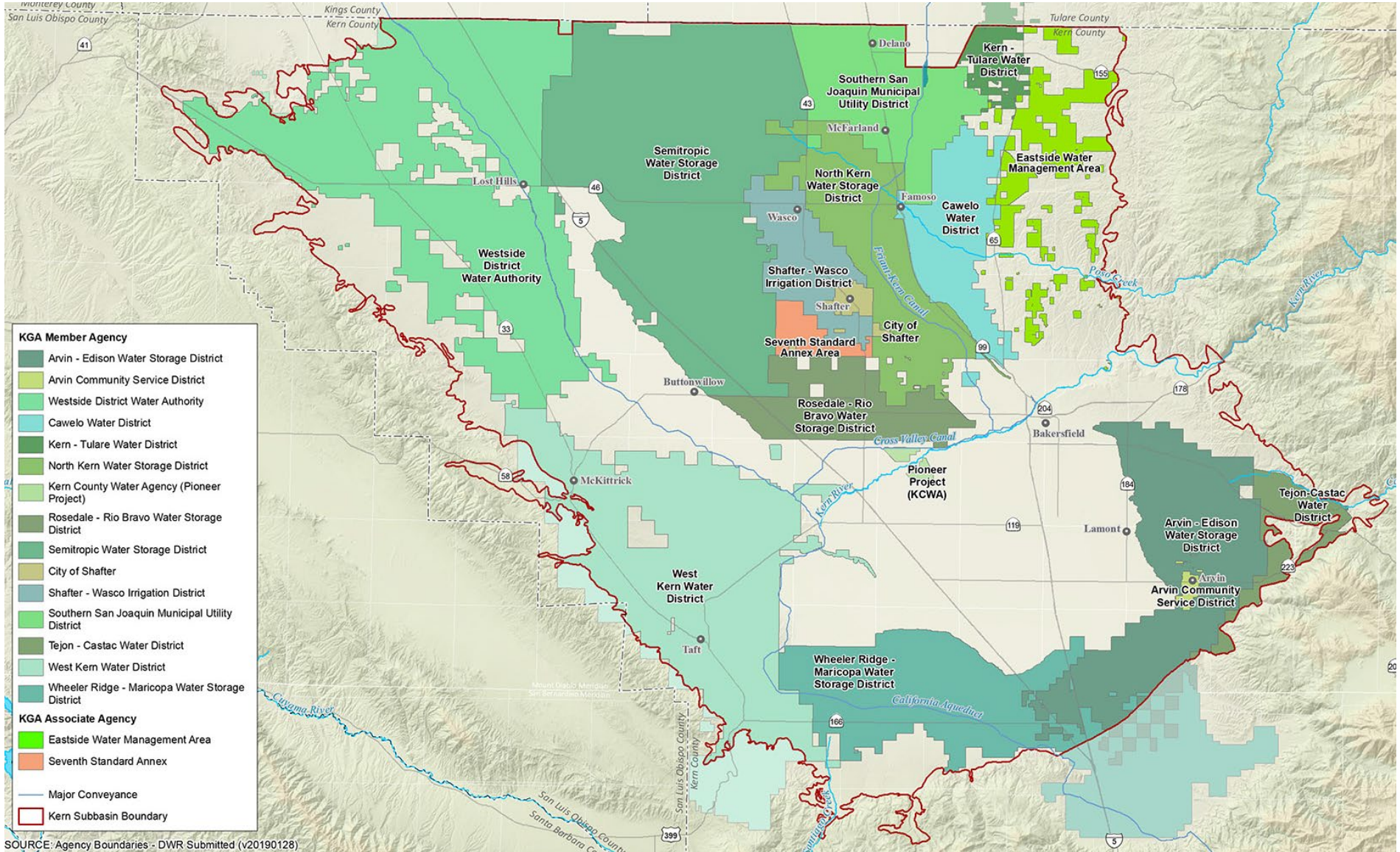
- KGA Member Agencies

Member Agencies	
Arvin Community Serviced District	Semitropic Water Storage District[1]
Arvin-Edison Water Storage District	Shafter-Wasco Irrigation District
Cawelo Water District[1]	Southern San Joaquin Municipal Utility District
City of Shafter	Tejon-Castac Water District
Kern County Water Agency - Pioneer Project[1]	West Kern Water District[1]
Kern-Tulare Water District	Westside District Water Authority
North Kern Water Storage District	Wheeler Ridge-Maricopa Water Storage District
Rosedale-Rio Bravo Water Storage District	
Associate Members	
Eastside Water Management Authority	

GSAs in the Subbasin



KGA Member Agencies



KGA Umbrella Layout

1. Introduction
2. Plan Area and Basin Setting
3. Sustainable Management Criteria
4. Projects and Management Actions
5. References
6. Attachments

KGA Umbrella Layout

- Management Area Plan Attachments
  - Arvin Edison Water Storage District
  - Cawelo Water District
  - Eastside Water Management Authority
  - Kern County Water Agency – Pioneer Project
  - Kern Tulare Water District
  - Kern Water Bank
  - North Kern Water Storage District & Shafter-Wasco Irrigation District
  - Rosedale-Rio Bravo Water Storage District
  - Semitropic Water Storage District
  - Southern San Joaquin Municipal Utility District
  - Tejon-Castac Water District
  - West Kern Water District
  - Westside District Water Authority
  - Wheeler Ridge-Maricopa Water Storage District

Sustainability Goal

- *The sustainability goal of the Kern County Subbasin is to:*
  - *Achieve sustainable groundwater management in the Kern County Subbasin through the implementation of projects and management actions at the member agency level of each GSA.*
  - *Maintain its groundwater use within the sustainable yield of the basin as demonstrated by monitoring and reporting groundwater conditions.*
  - *Operate within the established sustainable management criteria, which are based on the collective technical information presented in the GSPs in the Subbasin.*
  - *Collectively bring the Subbasin into sustainability and to maintain sustainability over the implementation and planning horizon.*

Sustainability Indicators

SGMA Definition:

- *"The management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results."*
- Where undesirable results are:
  - Chronic lowering of groundwater levels
  - Reduction of groundwater storage
  - Seawater intrusion
  - Degraded water quality / contaminant plume migration
  - Land Subsidence
  - Depletion of interconnected surface water

Sustainability Indicators

- Undesirable Results Definitions:

Chronic Lowering of Water Levels

The point at which significant and unreasonable impacts over the planning and implementation horizon, as determined by depth/elevation of water, affect the reasonable and beneficial use of, and access to, groundwater by overlying users

This is determined when the minimum threshold for groundwater levels are exceeded in at least three (3) adjacent Management Areas that represent at least 15% of the subbasin or greater than 30% of the subbasin (as measured by each Management Area).

Sustainability Indicators

- Undesirable Results Definitions:

Groundwater Storage

The point at which significant and unreasonable impacts, as determined by the amount of groundwater in the basin, affect the reasonable and beneficial use of, and access to, groundwater by overlying users over an extended drought period. (10-years?).

This is determined when the volume of storage (above the groundwater level minimum thresholds) is depleted to an elevation lower than the groundwater level minimum threshold in at least three (3) adjacent Management Areas that represent at least 15% of the subbasin or greater than 30% of the subbasin (as measured by each Management Area).

Sustainability Indicators

- Undesirable Results Definitions:

Degraded Groundwater Quality Trends

The point at which significant and unreasonable impacts over the planning and implementation horizon, as caused by water management actions, that affect the reasonable and beneficial use of, and access to, groundwater by overlying users.

This is determined when the minimum threshold for a groundwater quality constituent of concern is exceeded in at least three (3) adjacent management areas that represent at least 15% of the subbasin or greater than 30% of the designated monitoring points within the basin.

Sustainability Indicators

- Undesirable Results Definitions:

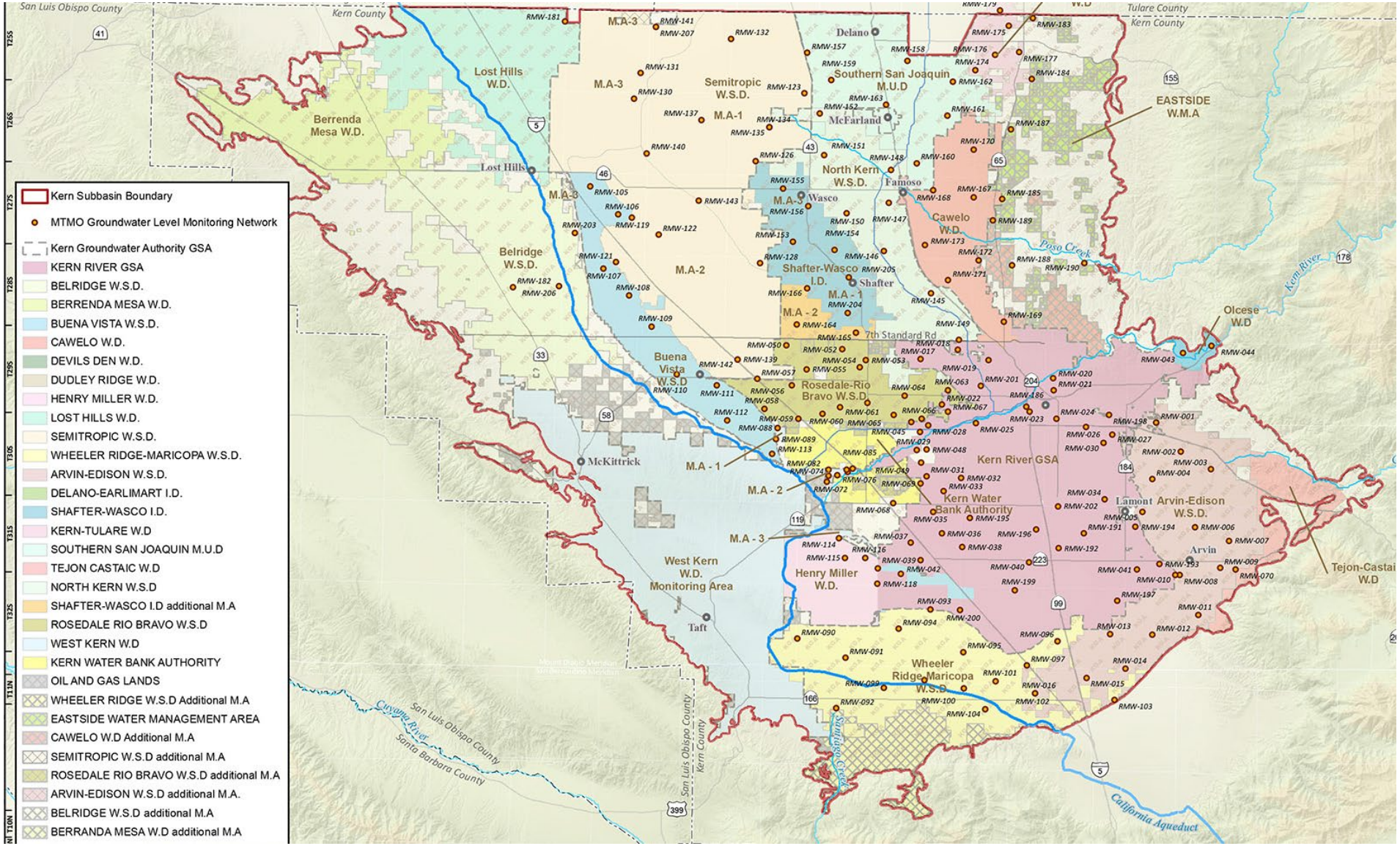
Land Subsidence Trends

The point at which significant and unreasonable impacts, as determined by a subsidence rate and extent in the basin, that affects the surface land uses or critical infrastructure.

This is determined when subsidence results in significant and unreasonable impacts to critical infrastructure as indicated by monitoring points established by a basin wide coordinated GSP subsidence monitoring plan.

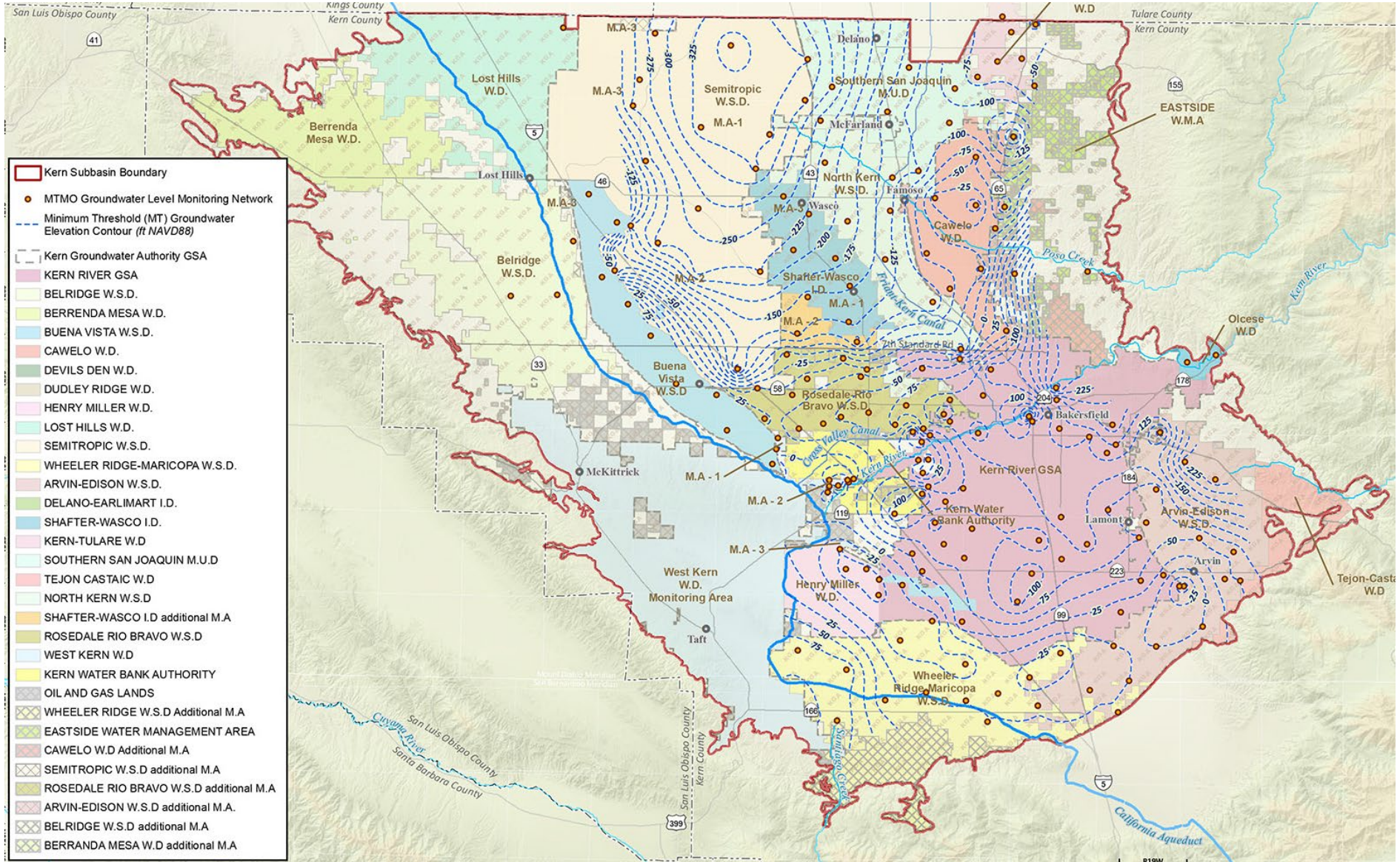
Sustainability Indicators

Monitoring Network



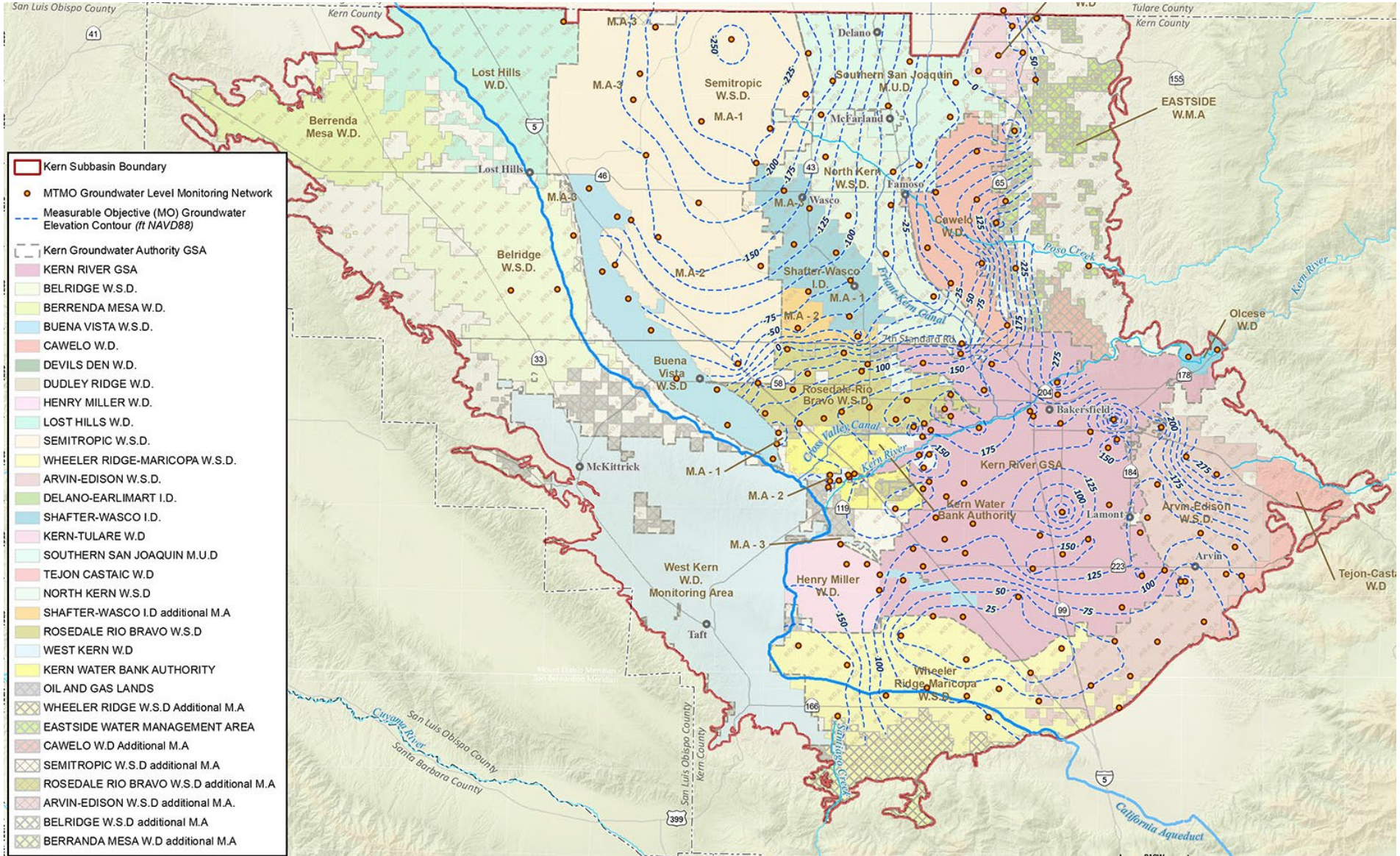
Sustainability Indicators

Minimum Thresholds



Sustainability Indicators

Measurable Objective



Projects and Management Actions

- Each Management Area Plan as developed has a list of projects and management actions
- Collectively, there are more than 160 projects and management actions being proposed by KGA member agencies
- Projects and management actions can be adaptively managed to meet potential challenges and provide flexibility
- KGA will continue to promote and facilitate collaboration between KGA member agencies and between other Subbasin GSAs
- *Projects and management actions are included in groundwater modeling exercise*

Subbasin Modeling – Future Conditions

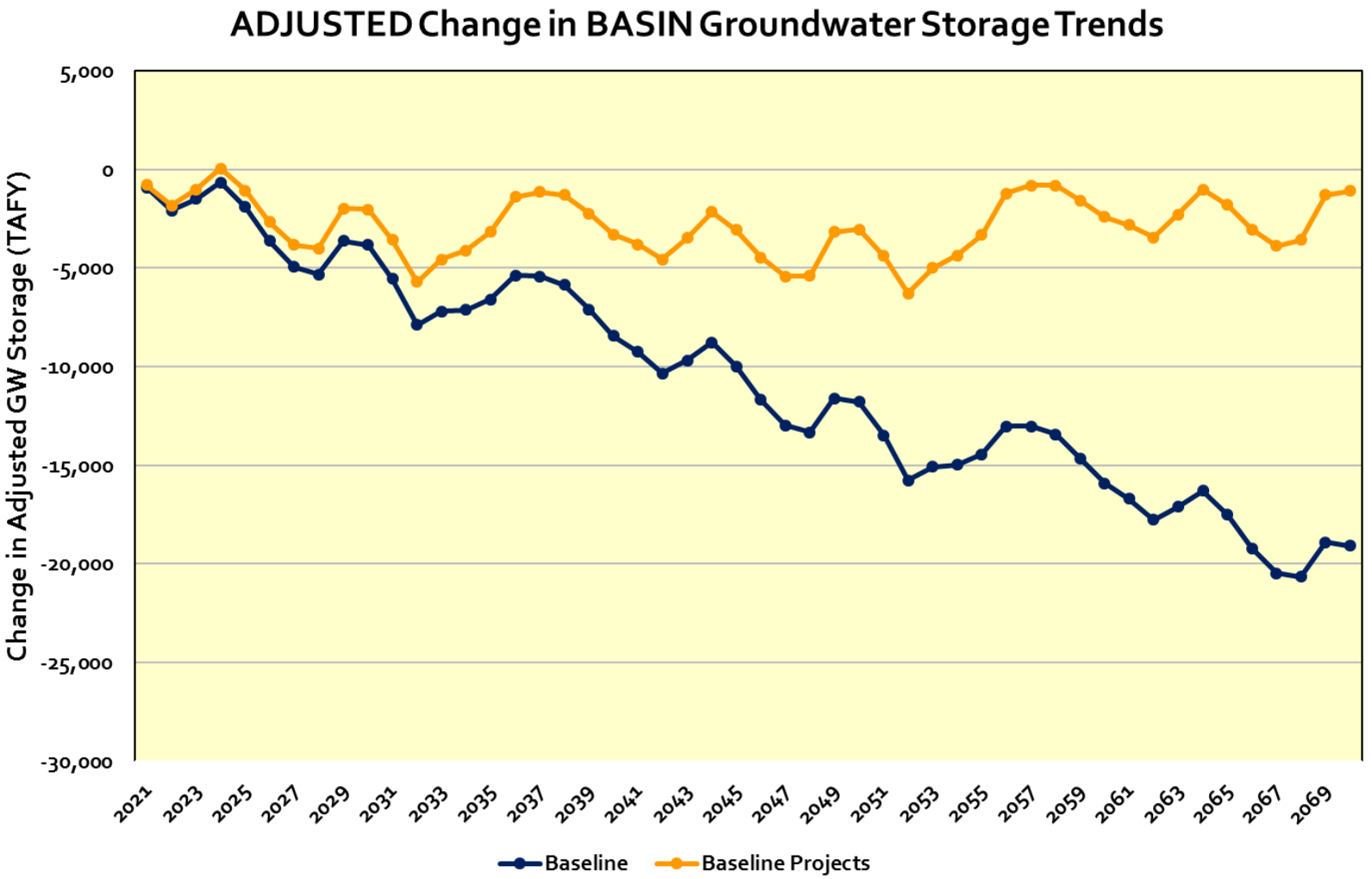
Kern County Subbasin Change in Groundwater Storage

TABLE 21: Evaluation of Change in Groundwater Storage Model Results for Kern County Subbasin

	Model Results 2041-2070 Sustainability Period		Adjustments to GW Storage Change 2041-2070 Sustainability Period			Adjustments for Banking 2041-2070 Sustainability Period	
Scenario	Change In Groundwater Storage	Change In Net Operational Budget	Adjustment for Excess Basin Outflows	Adjustment for Excess Kern River Outflow	Adjusted Change In GW Storage	Adjusted Banking Obligation	Δ Total Operational Storage
units	AFY	AFY	AFY	AFY	AFY	AFY	AFY
Historic	-277,114	-190,012	0	0	-277,114	85,965	-363,079
Baseline	-354,970	-271,881	0	0	-354,970	69,632	-424,602
Base Projects	34,614	158,881	28,894	9,454	72,963	69,632	3,331
2030 Climate	-413,519	-340,236	0	6,242	-407,276	67,913	-475,189
2030 Projects	-17,170	98,622	29,952	21,230	34,012	67,913	-33,901
2070 Climate	-521,517	-450,859	0	13,879	-507,637	64,474	-572,111
2070 Projects	-114,560	776	32,076	31,385	-51,099	64,474	-115,573

Subbasin Modeling – Future Conditions

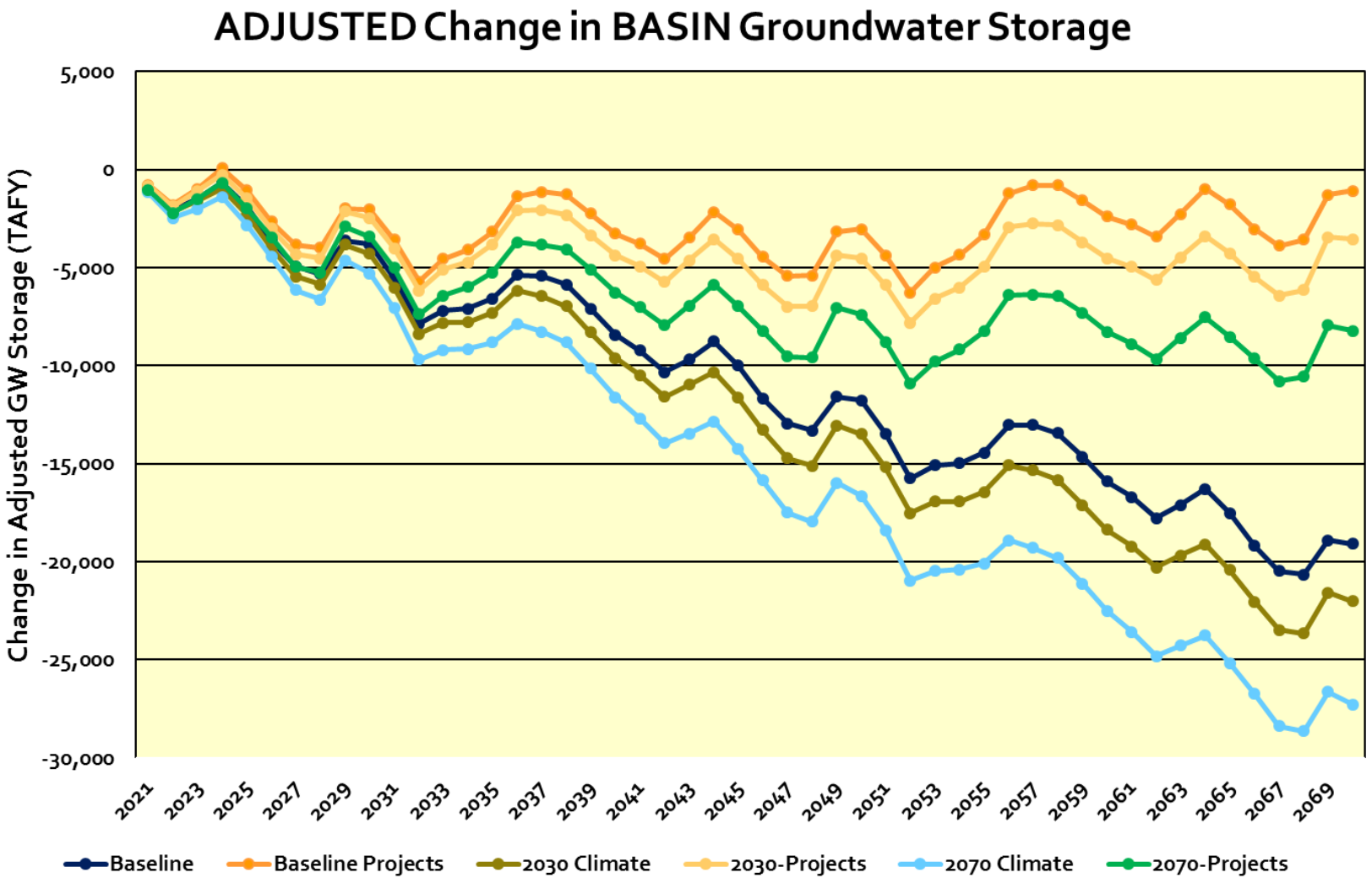
Kern County Subbasin Baseline Conditions



Collectively, the projects and management actions address current and projected deficits to achieve sustainable management

Subbasin Modeling – Future Conditions

Kern County Subbasin with Climate Change



Proposed projects and management actions have the resiliency to address future climate change conditions and can be adaptively managed to meet sustainable management goals

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