East Kaweah GSA

GSP Revisions Update

EAST KAWEAH
GROUNDWATER SUSTAINABILITY AGENCY

July 20, 2022 TAC
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EST. 1968
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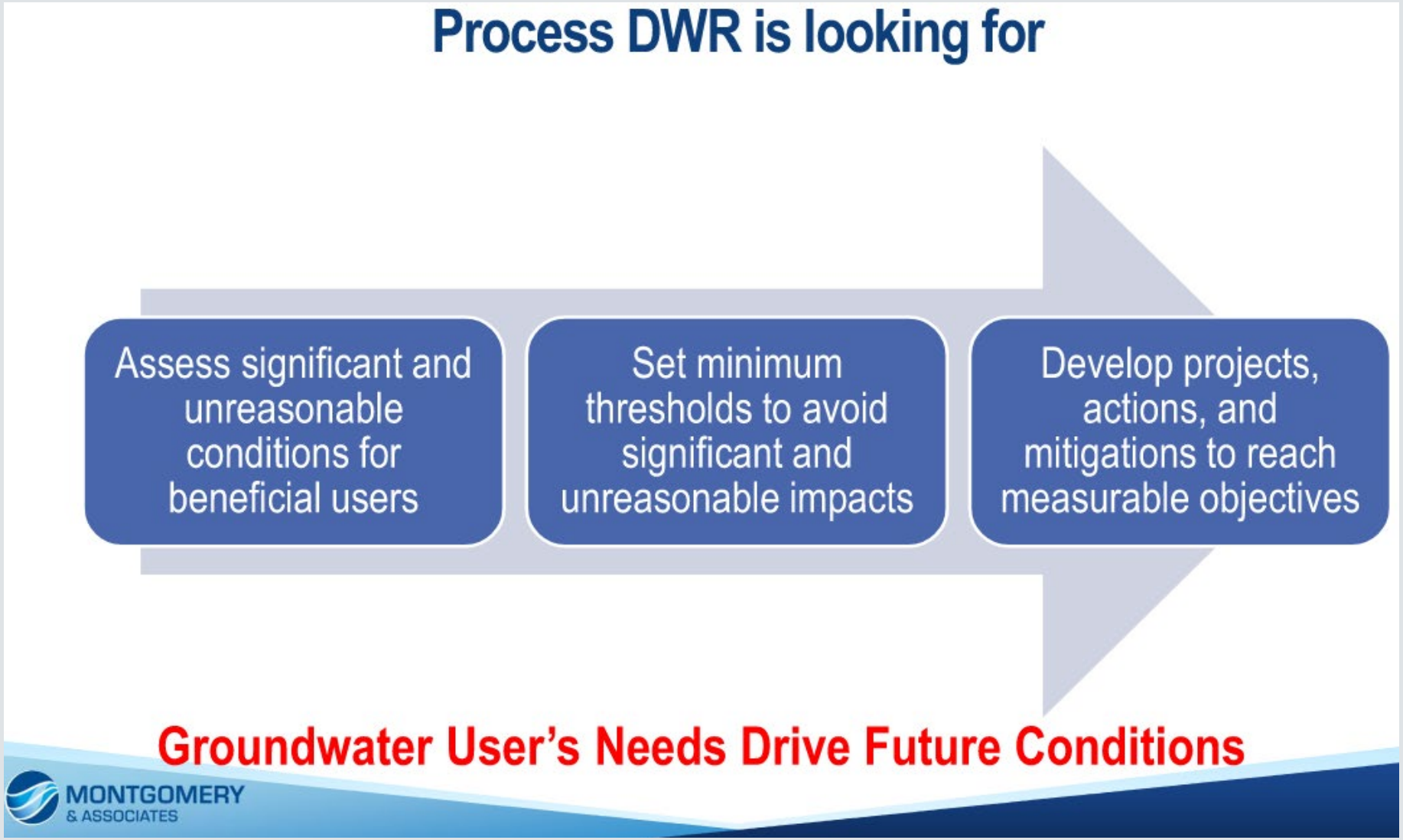
Reminder of Process

- DWR Released GSP Incomplete Determination for Kaweah Subbasin on January 28, 2022.
- Three deficiencies the Kaweah Subbasin needs to address within 180 days:
  - SMC for lowering groundwater levels not set in the manner required by SGMA Regs.
  - SMC for Subsidence not set in the manner required by SGMA Regs.
  - GSPs do not consistently identify interconnected surface water or set their SMC in the manner required by SGMA Regs.
- GSP modification & response due July 27, 2022

DEFICIENCY 1: CHRONIC LOWER OF GROUNDWATER LEVELS

Def. 1: SMC for Lowering Groundwater Levels



SMC for Lowering Groundwater Levels

- Identifying Beneficial Uses/Users:
  - Ag
  - DAC
  - Domestic
  - Municipal
  - Small Systems
- Subbasin coordinated to select groundwater levels protective of the 90th percentile of completed depths for all beneficial use/user type wells since 2002.
- Evaluated across 39 zones

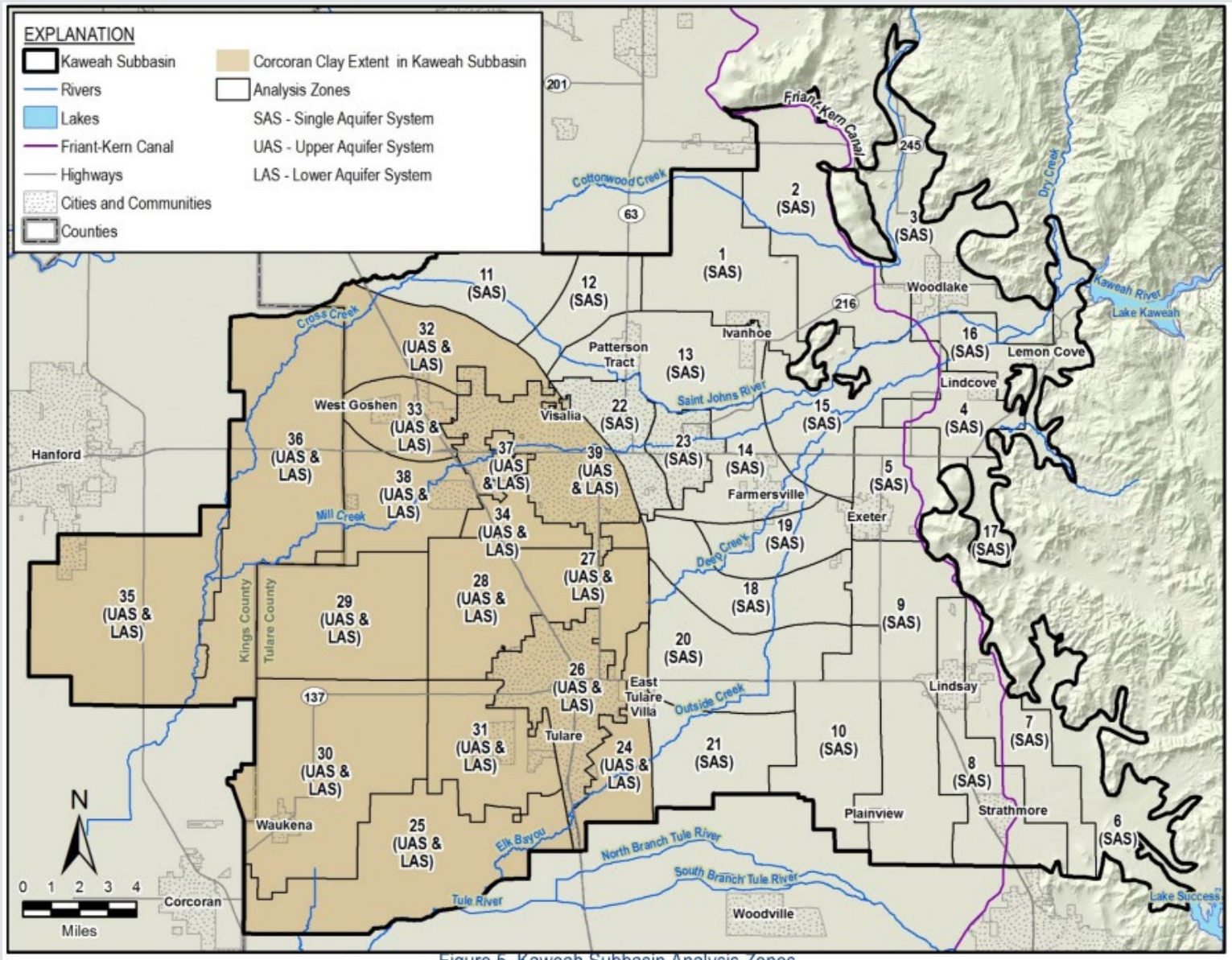


Figure 5. Kaweah Subbasin Analysis Zones

SMC for Lowering Groundwater Levels

- After reviewing the completed depth for 90th percentile completion depths of all beneficial use/user type wells in a zone found that all 10 EKGSA Threshold Region MTs were more protective (i.e., higher elevation).
- Incorporated into the methodology that GSA would not allow for a greater rate of groundwater level decline than that historically experienced (2020 GSP trend analysis), leading the GSA to be more protective – going to deeper MTs would be undesirable to the EKGSA
- Results of analysis are that the EKGSA Groundwater Level MTs are not changing
- The Subbasin GSAs has been evaluating the MT contour across the Subbasin to understand the “smoothing” of the contours.

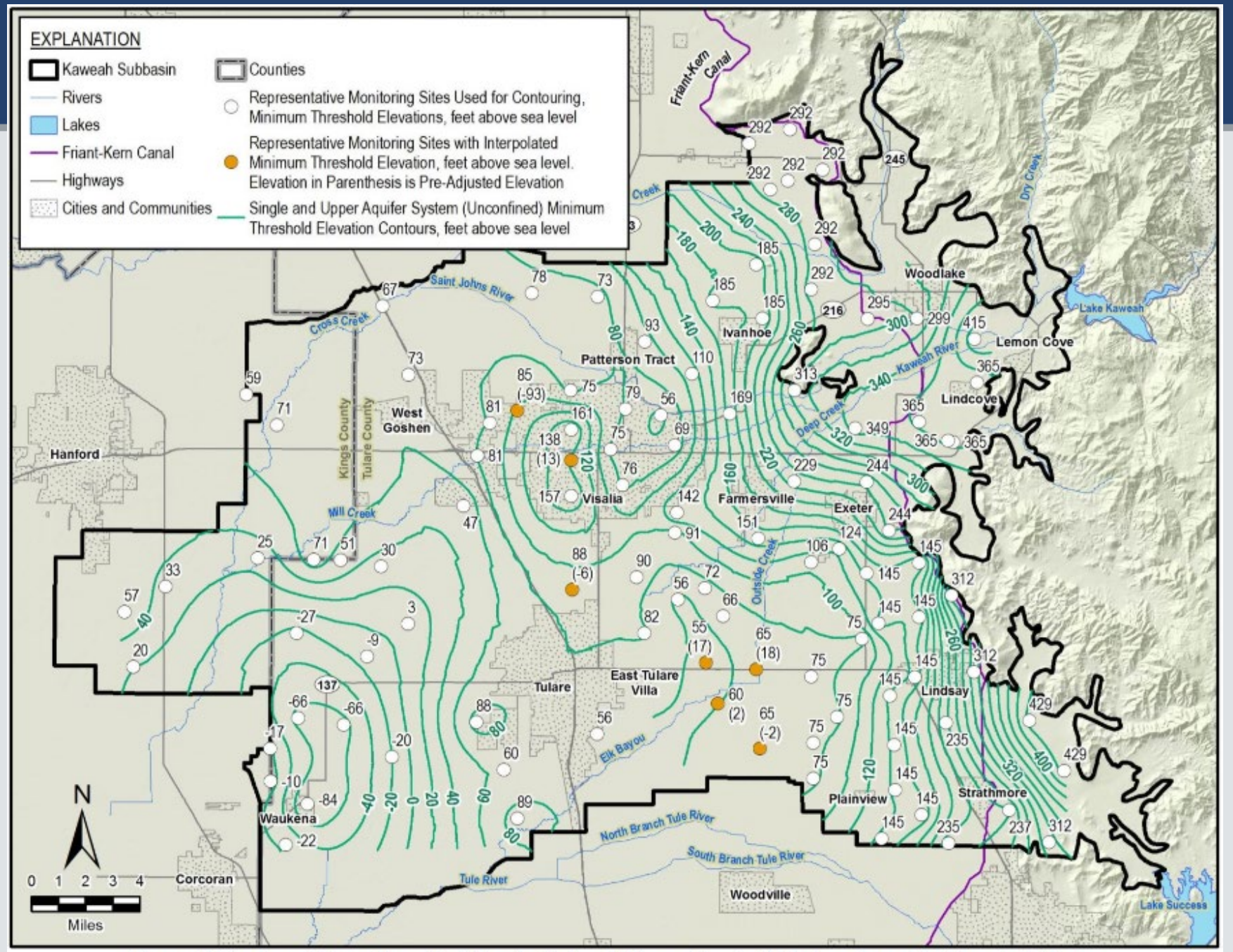


Figure 15. Single and Upper (Unconfined) Aquifer System Minimum Threshold Contours Across the Kaweah Subbasin

SMC for Lowering Groundwater Levels

- The Subbasin understands there are wells that will be impacted prior to the MT elevations and is committing to further develop a Mitigation Plan
- A framework for the mitigation plan is going into the GSP revisions. The Mitigation Plans and corresponding funding are still to be coordinated and developed across the Subbasin.
- Preliminary analysis approximates the following number of wells could be impacted if water levels reach MT. More investigation to fill gaps and gain more detail will be an on-going effort.

Table 4. East Kaweah GSA Potentially Impacted Wells

Well Use Type	Well Records with Known Depth			All Well Records		
	Number of Wells	Number of Potentially Impacted Wells	Percentage Potentially Impacted Wells	Number of Wells	Number of Potentially Impacted Wells	Density of Wells (wells per square mile)
Domestic	440	61	14%	463	64	0.35
Agricultural	755	52	7%	793	55	0.30
Public Supply	22	3	14%	22	3	0.02
Industrial	2	0	0%	3	0	0
Total	**1,219**	**116**		**1,281**	**122**	**0.66**

SMC for Lowering Groundwater Levels

- A draft framework for triggering conditions that may guide the mitigation program.

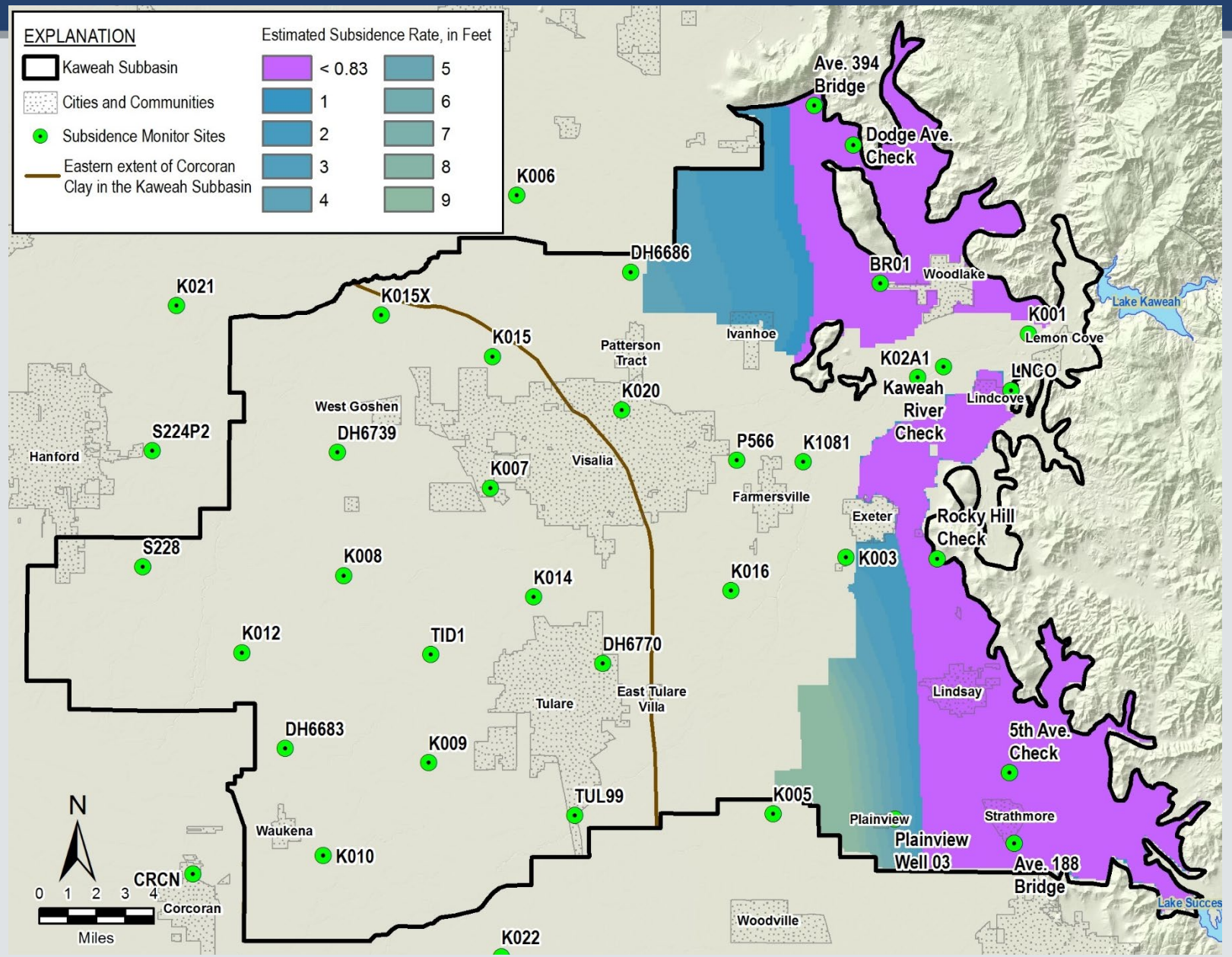
Trigger	Conditions	Investigation/ Qualifications	Outreach	Mitigation	GW Management
Green	Groundwater conditions are stable at or above established MO. No Issues are anticipated	Typical monitoring schedule and GSP Management	Annual Monitoring Report	None expected	Continue GSP Planning at objective management
Yellow	Groundwater conditions below established MO and above 50% of established MT by Threshold Region.	Monitoring Network indicating some areas may need further investigation. Initiation of investigation and vetting of specific conditions. Evaluate monitoring frequency.	Annual Monitoring Report; Visual representation of impacted area on GSA map	Following investigation/ qualification - GSA implementing applicable mitigation method for the specific issue	GSA to evaluate annual allocation amount in next allocation period
Orange	Groundwater conditions below 50% of operational range and above the established MT by Threshold Region	Monitoring Network indicating areas need further investigation. Initiation of investigation and vetting of specifc conditions. Evaluate monitoring frequency.	Annual Monitoring Report; Visual representation of impacted area on GSA map; Increased communications	Following investigation/ qualification - GSA implementing applicable mitigation method for the specific issue	GSA to evaluate localized groundwater pumping limits or actions
Red	Groundwater conditions at or below established MTs by Threshold Region	Monitoring indicating many areas need further investigation. Initiation investigation and vetting of specific conditions. Monitoring frequency increased.	Annual Monitoring Report; Visual representation of impacted area on GSA map; Increased communications; Working with local agencies	Following investigation/ qualification - GSA implementing applicable mitigation method for the specific issue. Looking into larger, long-term solutions to address significant impacts	GSA to evaluate broader groundwater pumping limits or actions

DEFICIENCY 2: SUBSIDENCE

Def. 2: SMC for Subsidence

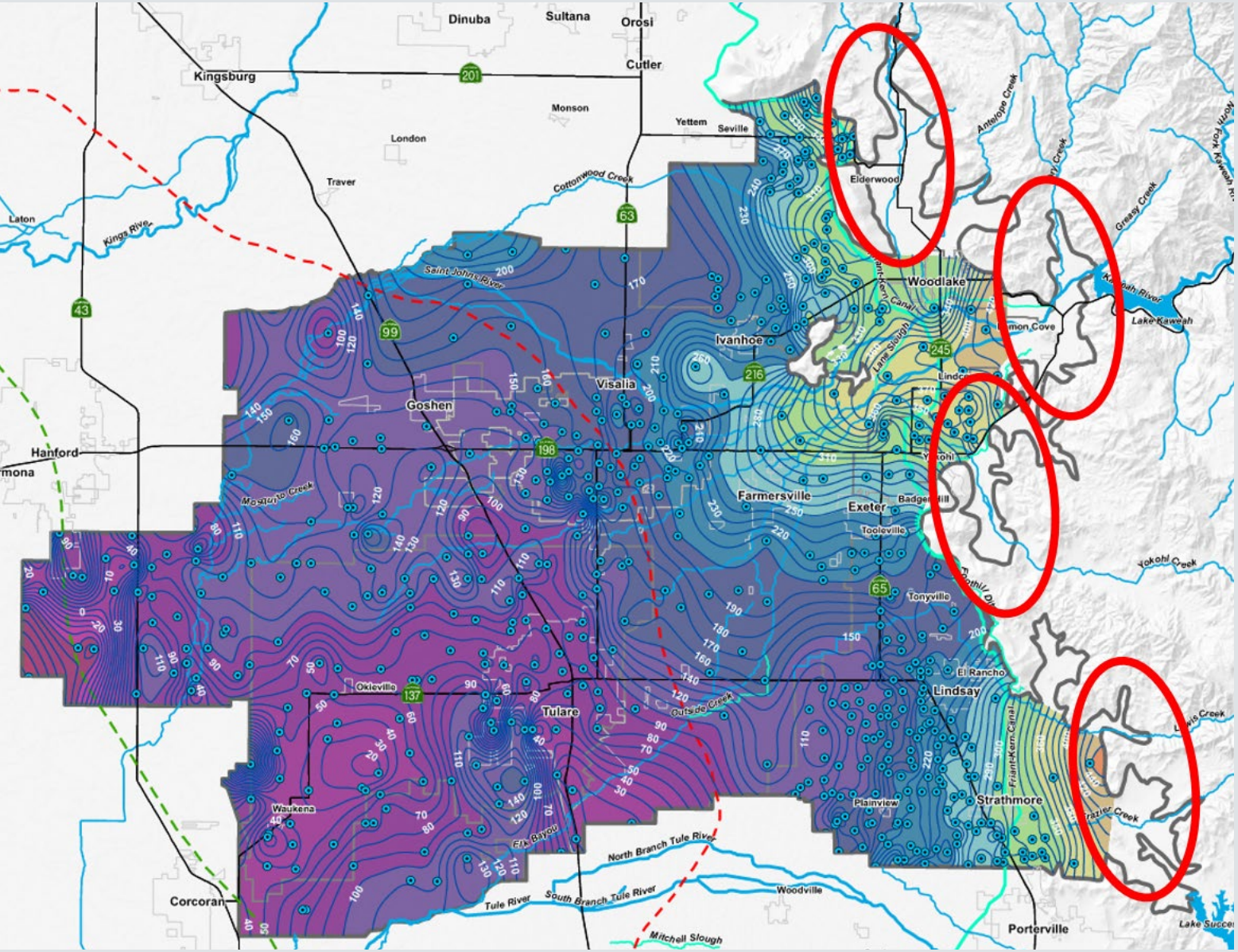
- The Friant-Kern Canal is listed as critical infrastructure for both the East and Greater Kaweah GSPs – Coordination to the 9.5-inch estimate for 10% capacity impact.
- Greater & Mid coordinating to a total subsidence MT of a 9 feet
- In some locations the subsidence MT may govern over groundwater levels, which means management actions related to reducing groundwater pumping may be triggered by subsidence.
- Mitigation related to subsidence impacts is to be developed, but details not as well understood as groundwater levels (wells dry).

Def. 2: SMC for Subsidence



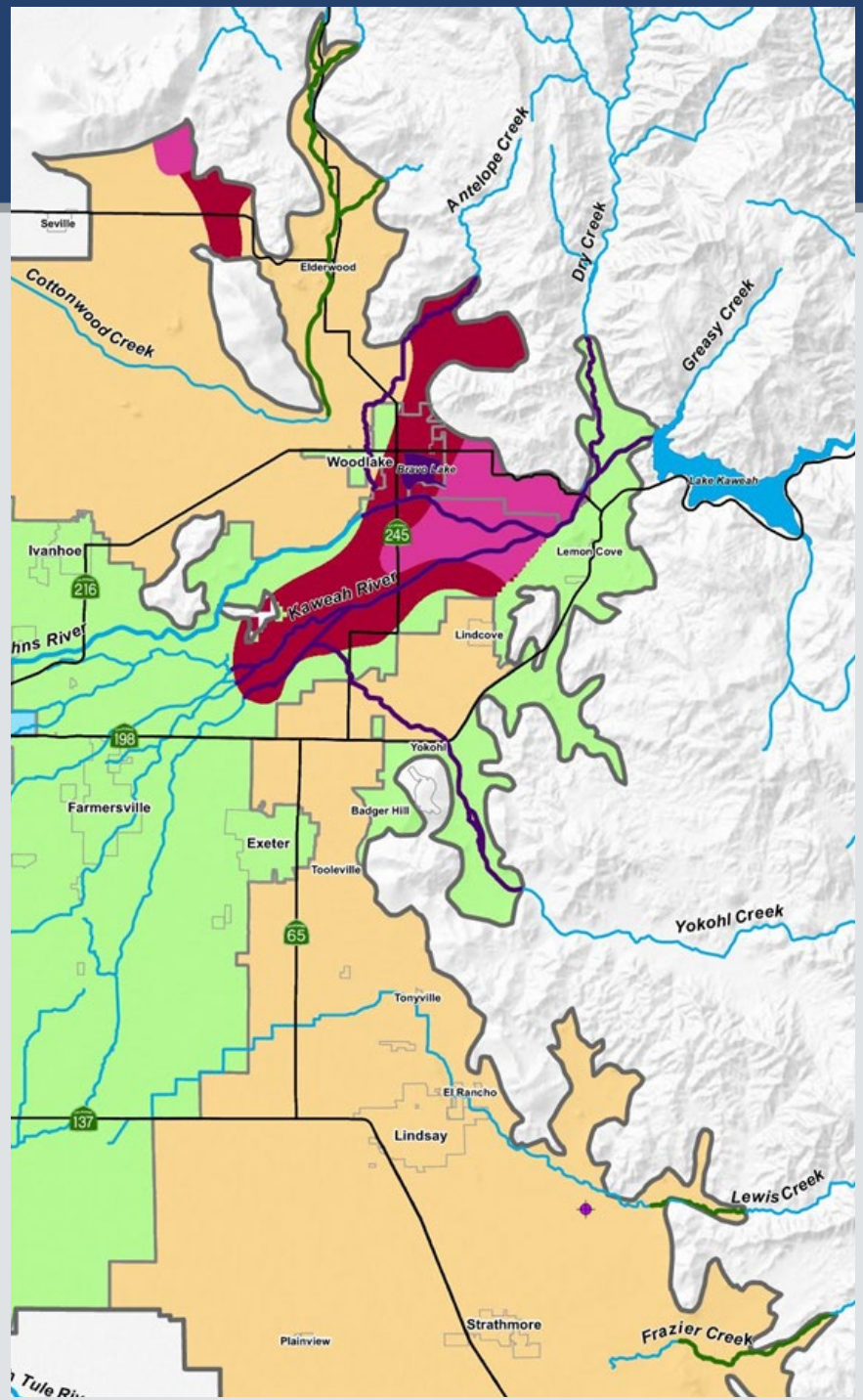
DEFICIENCY 3: INTERCONNECTED SURFACE WATER (ISW)

SMC for ISW



- Significant gaps exist in potential locations – closer to the watersheds in the foothills
- GSAs working to fill groundwater level monitoring data gaps
- Most waterways are ephemeral and lack flow for many years
- Groundwater pumping in or around this areas unknown

SMC for ISW



- Study area to in areas where groundwater level has been within 30 feet of ground surface since SGMA was enacted OR where no groundwater level data currently is available
- Evaluating Spring 2015 (dry year) and Spring 2017 (wet year) for the range of downstream limits
- Waterways in the EKGSA are:
  - Cottonwood Creek
  - Antelope Creek
  - Kaweah River
  - Yokohl Creek
  - Lewis Creek
  - Frazier Creek

SMC for ISW

- Proposing preliminary SMC on channels Losses: MT at 50% losses; MO at 30% losses
- Using 1970 Tulare County Flood Master Plan for 25-Year Storm on channels with little flow data

Monthly flow data based on flow measurement records from Water Years 1981-2021

Water Body	Flow (CFS)	Channel Capacity[1]	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Kaweah River	Max	N/A	1,221	2,061	2,594	4,540	3,735	3,281	3,100	3,662	4,481	4,506	2,362	1,705
	Min		0	0	0	0	0	0	0	7	51	53	13	0
	Avg		611	1,031	1,297	2,270	1,868	1,641	1,550	1,834	2,266	2,280	1,188	853
	50% MT		**305**	**515**	**649**	**1,135**	**934**	**820**	**775**	**917**	**1,133**	**1,140**	**594**	**426**
	30% MO		**183**	**309**	**389**	**681**	**560**	**492**	**465**	**550**	**680**	**684**	**356**	**256**
Antelope Creek	Max	1,340	Not enough flow data records to quantify by month											
	Min													
	Avg													
	50% MT	**670**												
	30% MO	**402**												
Yokohl Creek	Max	3,960	Not enough flow data records to quantify by month											
	Min													
	Avg													
	50% MT	**1,980**												
	30% MO	**1,188**												
Cottonwood Creek	Max	6,170	Not enough flow data records to quantify by month											
	Min													
	Avg													
	50% MT	**3,085**												
	30% MO	**1,851**												
Lewis Creek	Max	1,850	Not enough flow data records to quantify by month											
	Min													
	Avg													
	50% MT	**925**												
	30% MO	**555**												
Frazier Creek	Max	1,010	Not enough flow data records to quantify by month											
	Min													
	Avg													
	50% MT	**505**												
	30% MO	**303**												

1 In instances where no flow data is available, the flow based upon the 1970 Tulare County Flood Control Master Plan was used for 25-Year Storm

SMC Summary

Sustainability Indicator	GW Elevation	GW Storage	SW-GW Connection	GW Quality	Land Subsidence
Undesirable Result	Unreasonable lowering of groundwater levels resulting in significant impacts to supply wells	Unreasonable reduction in groundwater storage	Unreasonable depletion of interconnected surface waterways, where present	Unreasonable long-term changes of water quality concentrations from baseline conditions to significantly impact users of groundwater	Loss of the functionality of a structure or a facility to the point that, due to subsidence, the structure or facility cannot reasonably operate without either significant repair or replacement
Measurement Methodology	Groundwater Levels	Groundwater Levels (Proxy)	Surface water depletion rate	Sampling for 3 COCs at Ag wells in Monitoring Network; Utilize public system Title 22 quality monitoring	Annual survey of set Mile Posts along the FKC and InSAR data when available and Plainview well point
Minimum Threshold	The most protective groundwater level in a threshold region based on protective level of the approximate 90th percentile of all water supply wells and not allowing a rate of groundwater decline greater than the historical groundwater decline experienced between 1997-2017	The most protective groundwater level in a threshold region based on protective level of the approximate 90th percentile of all water supply wells and not allowing a rate of groundwater decline greater than the historical groundwater decline experienced between 1997-2017	More than 50% losses in interconnected surface waterways when water is present	No long-term (10-yr. running average) increase in concentration beyond recognized Ag or Urban standards for those wells under the threshold. For those wells over the recognized Ag or Urban standards, no long-term increases by 20% in concentration	9.5" of subsidence in a year and cumulative (relate to no more than 10% capacity reduction in current capacity of the FKC)
Measurable Objective	Spring 2017 groundwater levels	Spring 2017 groundwater levels	Equal to or less than 30% losses in interconnected surface waterways when water is present	No unreasonable increase in concentration caused by groundwater pumping and recharge efforts	No subsidence throughout the GSA
Interim Milestones	Proportionate to % of overdraft to be corrected in 5-year intervals through implementation period	Proportionate to % of overdraft to be corrected in 5-year intervals through implementation period	Proportionate to % of overdraft to be corrected in 5-year intervals through implementation period	No change from current Objective (re-evaluate at the 5-year milestone pending data collection)	No change from current Objective

End