



SANTA CRUZ COUNTY  
ENVIRONMENTAL HEALTH



# Well Ordinance Update

TAC Meeting #3, Jan 29, 2024

# Agenda:

- 1) Welcome
- 2) Review Ordinance Update Process
- 3) Review definitions of replacement wells and de minimis wells,
- 4) Initial Review of Tiered Approach
- 5) Well interference requirements and setbacks
- 6) Natural resource and public trust considerations
- 7) Calculated setback input.
- 8) Second review of Tiered Approach
- 9) Questions, Discussion, Suggestions
- 10) Next Steps



TAC Update Meetings	Meeting Topics (Subject to Change)
<p align="center"><b>Meeting 1; November 6, 2023</b></p>	<p>1) Introductions, ground rules, goal, expectations  2) Intro to well ordinance, reasons for update  3) Code update process  4) Topics for future in-depth discussion</p>
<p align="center"><b>Meeting 2; December 8, 2023</b></p>	<p>Focused meeting on groundwater:  1) Sustainable Groundwater Management Act, GSAs, GSPs  2) Groundwater emergencies  3) Metering of non-de minimis new and replacement wells  5) Areas of declining GW levels/quality and new wells  6) How to include Karst</p>
<p align="center"><b>Resource Impact Subgroup January 8, 2024</b></p>	<p>Review and discussion of resource impacts, considerations and tiered approach to well permit evaluation and requirements</p>
<p align="center"><b>Meeting 3; January 29, 2024</b></p>	<p>Evaluating surrounding impacts of wells:  1) Consider impacts to surrounding wells  2) Discuss where/how wells may impact Public Trust values  3) Discuss tiered approach to determine when additional evaluation and/or protections are needed</p>
<p align="center"><b>Meeting 4; Late Spring 2024</b></p>	<p>TAC reviews draft language and assessment of impacts to staffing, permit turnaround time, and fees.</p>
<p align="center"><b>Public Workshop</b></p>	
<p align="center"><b>Meeting 5</b></p>	<p>Review Final language</p>
<p align="center"><b>Optional Meeting 6</b></p>	<p>Final review after changes from Planning Commission, Coastal Commission, BOS</p>

# Current Well and Water Use Characteristics



- Average rural de minimis use is 0.3-0.5 af/yr/unit, based on metered use by rural small water systems.
- Most rural properties use onsite wastewater disposal, with 90% of indoor water use (50-70%) returned to the groundwater basin.
  - $0.35 \times 70\% \times 90\% = 0.22$  af/yr recharge (or 0.13 af/yr net consumption)
- Over 70% of new wells are deeper than 300ft. Only 7% are less than 200 ft. deep.
- The average agricultural well pumps 50 af/yr, the largest pumps 225 af/yr, based on recent well permits.

Small System Name	Connections	2015 Use (gallons)	2015 Use / Connection (gallons)	2015 Water Use Factor (AFY)
Allan Lane Water Association	16	4,326,708	270,419	0.83
Aptos Hills Mutual Water Co.	11	2,514,698	228,609	0.70
Aptos Ridge Mutual Water Co.	16	3,375,425	210,964	0.65
Larkin Ridge Mutual Water Co.	5	329,270	65,854	0.20
Milky Way Mutual Water Co.	9	420,975	46,775	0.14
Trout Gulch Mutual	186	13,754,865	73,951	0.23
Purisima Mutual Water Co.	14	1,767,174	126,227	0.39
PureSource Water Inc.	80	5,315,289	66,441	0.20
Jarvis Mutual Water Co.	36	2,143,690	59,547	0.18
Laurel Community League	24	1,283,012	53,459	0.16
<b>Average All</b>				<b>0.37</b>
<b>Average Mid-County Basin</b>				<b>0.23</b>
<b>Average Pajaro Valley Sub-basin</b>				<b>0.50</b>

# Definition of Replacement/Supplemental Well

## Possible Considerations:

1. No significant increase in water use, area where water is used?
  2. Draw from same aquifer; depth? (May want to encourage use of deeper zone?)
  3. No increase in pump size or pipe diameter?
- (6) “New Well” means a well that will serve a new or significantly expanded use, which represents an increased extraction of groundwater.
  - (7) “Replacement Well” means a well that will serve an existing use with no significant increase in water use and will replace an existing water source such as a spring or well that is to be destroyed.
  - (8) “Supplemental Well” means a well that that will support an existing use with no overall increase in water use. The existing source could be a shared well or other well that will be maintained as a backup source.

# Proposed Tiered Approach to Review and Conditions



1. Extent of review/mitigation based on pumping amount, aquifer properties, basin status, resource value/vulnerability.
2. Simple minimum setback and seal requirements for Tier 1 and 2 wells (de minimis and supplemental/replacement)
3. More nuanced calculation for Tier 3 based on pumping amount, setback, aquifer properties, basin status, resource value/vulnerability.
4. CEQA review and project specific evaluation/mitigation for Tier 4.
5. Tiered approaches are also used in Sonoma, Glenn and Monterey counties

Proposed Level of Review and Mitigation Required for Various Types of Well permit Applications					
Tier	Criteria	Average Number of Permits/year	CEQA Review Required?*	Connected Stream Setback	Nearby Well Setback
Tier 1	De Minimis < 5 connections; <2 AFY	44	Ministerial	100 ft or deep seal**	50 or 100 ft
Tier 2	Non-De minimis Replace/Supplemental	11	Ministerial	200 ft, or deep seal, not less than existing	200 ft, not less than existing
	Public Water system 5-199 connections	1			
Tier 3	New Non-De minimis wells that are consistent with GSPs and meet setbacks	2	Ministerial	Using depletion model (Reeves, 2008), 10th percentile dry season flow shall not be depleted by more than 5% after 60 days of pumping ***	Calculated minimum setback so that impact on nearby well is less than 1 foot****
	Wells that do not meet Tier 1 or 2 minimum, but do meet calculated setbacks	?			
Tier 4	Wells that do not meet Tier 1,2,or 3 requirements; or located in gw concern area	?	Yes	Analysis, including effect on streamflow in overall basin	Analysis
	Public Water System Serves > 199 connections	1			
Notes:					
*	Well permit is discretionary if other discretionary permits are required by other sections of County				
**	Deep Seal is 100 ft or first impermeable layer, whichever is less.				
***	Streamflow depletion model, STRMDEPL08, Reeves, 2008: <a href="https://mi.water.usgs.gov/software/groundwater/strmdepl08/">https://mi.water.usgs.gov/software/groundwater/strmdepl08/</a>				
****	Use modified Theis Non-Equilibrium Equation (Cooper-Jacob), with proposed well parameters and regional aquifer properties. Calculated drawdown at proposed distance of nearby well should not exceed 1 foot after 60 days of pumping.				
Water use efficiency measures are required for all non-de minimis wells; other mitigation measures may be required.					

# Setbacks to Reduce Well Interference:



1. Santa Cruz currently has no requirement for setback to wells. Setback to septic system is 100 ft, setback to property line is 50 ft.
2. San Mateo requires 50 feet for all wells; Monterey uses threshold calculation for large new wells.
3. Glenn County uses a nomograph for larger wells. Well that pumps 100 af/yr would require a 100–200 ft separation for less than 20 ft drawdown.
4. Santa Cruz Proposal
  - 100 feet for de minimis (Tier 1)
  - 200 ft for replacement non-de minimis (Tier 2)
  - Use Modified Theis Non-Equilibrium Equation for Tier 3
$$s = (264Q/T) * \log(.3Tt / (r^2)S)$$
  - At 8 gpm, in Purisima A, at 200 ft setback, drawdown is 1 ft.
  - How much drawdown is ok? 1 ft?, 5 ft?, 10 ft? 20 ft? 5%?
5. For replacement wells if setback could not be met, the new well could be no closer to nearby wells than the existing well.
6. Setbacks would not be required for other wells on the same property.



# Resource Impact Considerations:



1. Impact to surface water flow and related public trust values, dry season baseflow
2. Consistency with applicable groundwater sustainability plans.
3. Applicability of the California Environmental Quality Act (CEQA) when there are discretionary aspects of well permit approval.
4. Provide for resource protection while minimizing impact on de minimis wells and replacement/supplemental non-de minimis wells serving existing uses.

# Primary concern is impact to streamflow

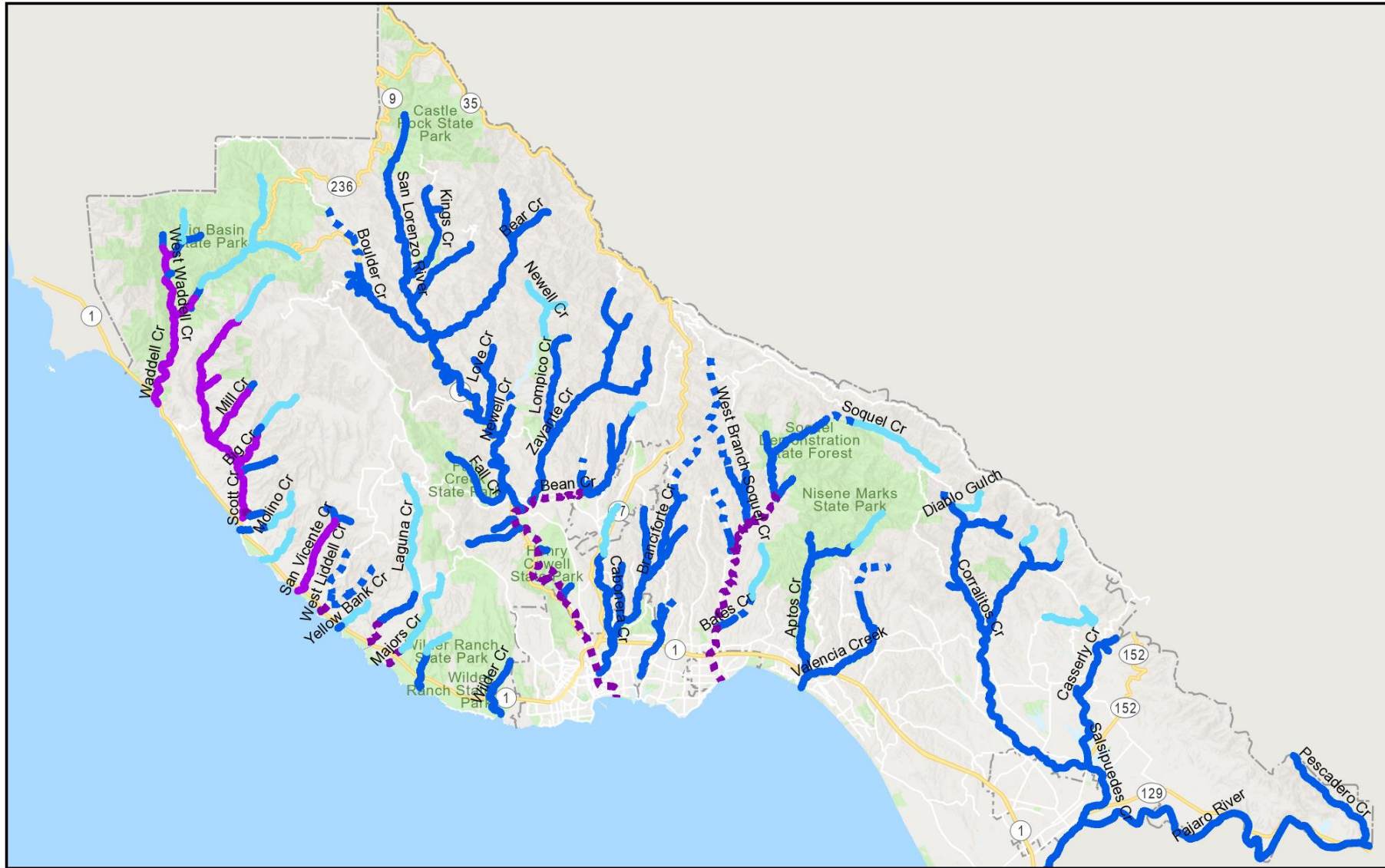


1. Habitat for Coho salmon, steelhead and other species
2. Most streams are interconnected with groundwater (except Pajaro Valley and Valencia Creek)
3. Major basin overdraft is primary cause of reduced dry season flow:
  - Modelling estimate: 14% reduction in Bean Creek
  - Modelling Estimates: 40% reduction in Soquel Creek (only 2-4% attributed to non-municipal pumping)
  - Water budget estimate: 9-17% reduction in Moore's Gulch (70 users/sq. mile)

Proximity of existing wells to streams:

Wells in Database		9,089	
Wells with Site Location		2,604	
	Setback to Stream(ft)	Number	Percent
	<50	60	2%
	<100	145	6%
	<200	327	13%
	<250	413	16%
	<500	820	31%
	<750	1,198	46%

# Salmonid Bearing Streams



January 8, 2024

**Street Labels**

Street Labels

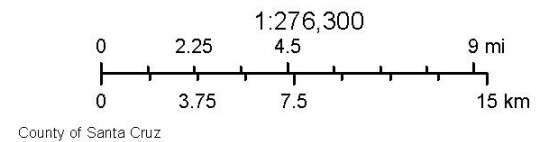
**Streams Fish Bearing**

- Steelhead and Limited Coho
- Steelhead and Coho

■ Steelhead High Flow

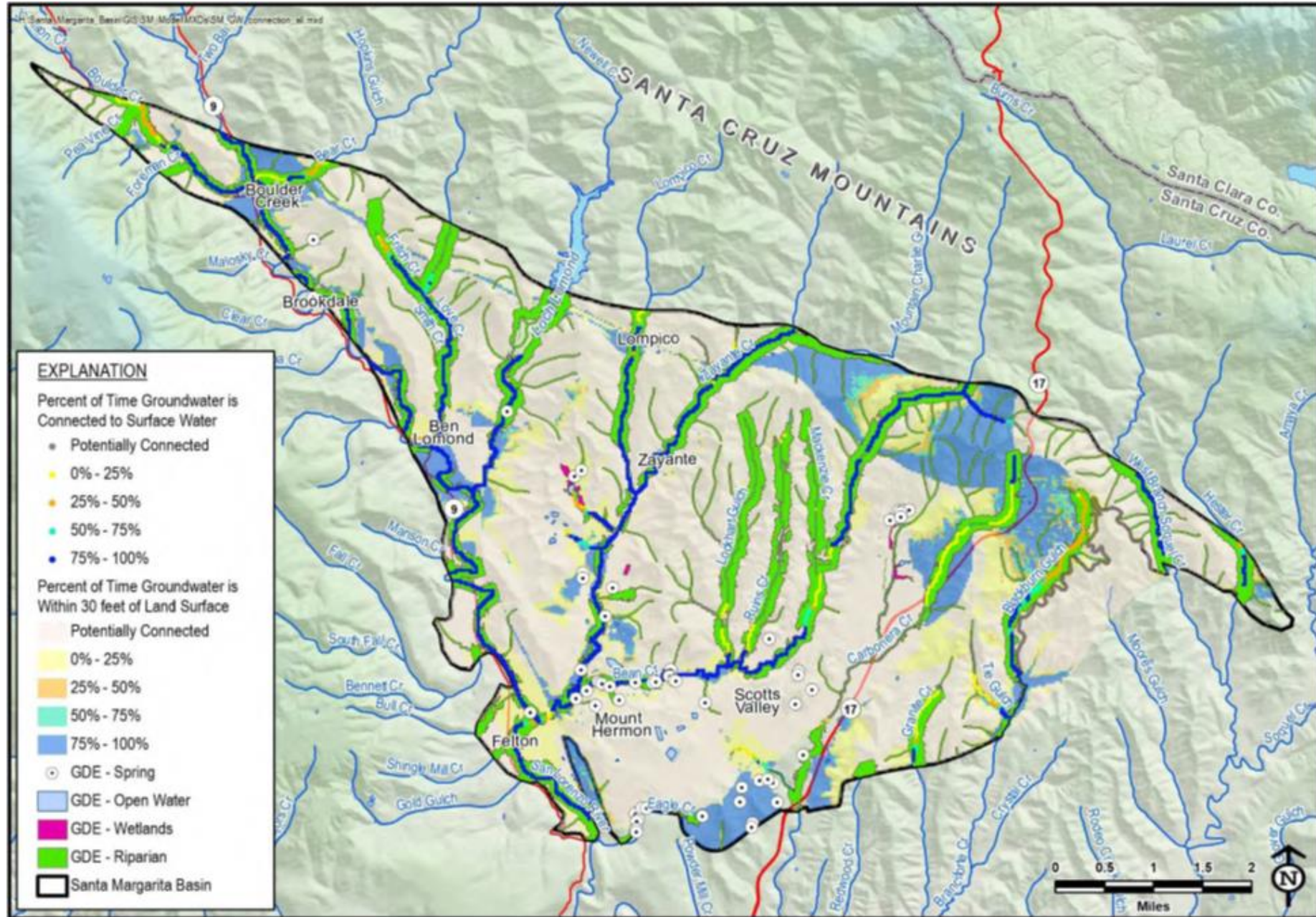
■ Steelhead

■ Resident Rainbow





# Interconnected Groundwater and Surface Water, Santa Margarita Basin



# Calculation of Streamflow Depletion:



- Potentially use Web-based STRMDEPL08, USGS
- Used by Monterey County for threshold evaluation
- Parameters below for Purisima A: 0.09 cfs depletion
- Amount of allowed depletion dependent on stream/values?
  - < 5%?; < 0.01 cfs?; 0.05 cfs?

## Partially penetrating stream with streambed resistance (Hunt, 1999)

Distance (ft):	200
Transmissivity (ft <sup>2</sup> /day):	2040
Storage Coefficient:	.02
Streambed Conductance (ft/day):	5.2
Pumping Rate (gpm):	50
Days of Pumping:	60

Units used

- ft: foot
- ft<sup>2</sup>/day: square foot per day
- gpm: gallons per minute
- ft/day: foot per day

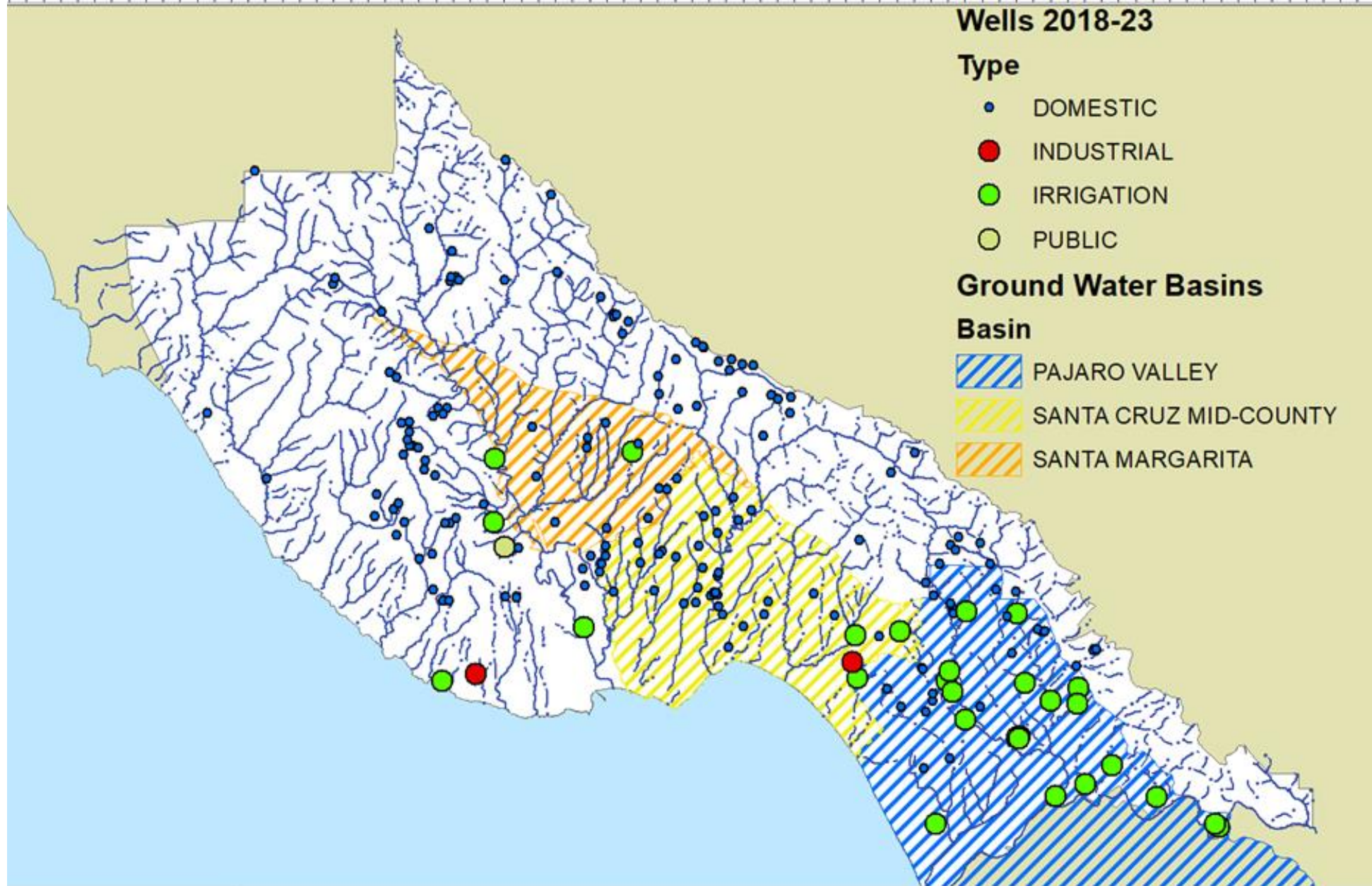
# Groundwater Sustainability:



1. Three basins with approved groundwater sustainability plans.
  - Pajaro Valley has not had interconnected surface water for many years.
  - In Mid-County and Santa Margarita, GSPs provide for raising groundwater levels and increasing flow in interconnected surface water.
2. Although overdraft is no longer occurring, reduced recharge due to climate change is major concern.
3. Plans generally assume no significant change/increase in water use; assume improved water efficiency but no mandatory reductions or restrictions in pumping or new wells.
4. Proposed significant new water use would potentially require more evaluation for impact on sustainability and streamflow.
5. Well applications are to be sent to all agencies for opportunity to review and comment.

<b>GSA</b>	<b>Total Well Records</b>		<b>Water Use (afy)</b>		<b>Well Permits (2018-23)</b>		<b>Non-De Minimis</b>	
<b>PAJARO VALLEY</b>	2,301	20%	24,300	70%	42	21%	21	66%
<b>MID-COUNTY</b>	2,497	21%	5,200	15%	40	20%	3	9%
<b>SANTA MARGARITA</b>	1,260	11%	3,000	9%	13	7%	1	3%
<b>No GSA</b>	5,626	48%	2,000	6%	102	52%	7	22%
<b>Total</b>	11,684		34,500		197		32	16%

# Well Permits and GSAs





# Well Permits:

	Subtotals	Percent	Average/year
Total Water Wells in Database	9100		
Well Construction Applications 2018-23	285		63/yr
Permit Type			
NEW WELL DOMESTIC	52	18%	10
NEW WELL IRRIGATION	3	1%	0.5
NEW WELL NON-DOMESTIC	6	2%	1
REPLACEMENT WELL - DOMESTIC	23	8%	
REPLACEMENT WELL - IRRIGATION	12	4%	
REPLACEMENT WELL - NON-DOMESTIC	6	2%	
SUPPLEMENTAL WELL - DOMESTIC	147	52%	
SUPPLEMENTAL WELL - IRRIGATION	22	8%	
SUPPLEMENTAL WELL - NON-DOMESTIC	14	5%	
Subtotal replacement/supplemental	224	79%	41
Subtotal Non-de minimis (non-domestic)	63	22%	13



## Environmental Review:



1. Well permits were discretionary and subject to CEQA review from 1987 to 2009.
2. CEQA review seemed to have limited benefit for resource protection; most were exempt, one was denied. Review could result in considerable expense and delay.
3. In 2009, well ordinance was modified make most well permits ministerial, but require water efficiency measures for all non-di minimis wells, including replacements.
4. Wells serving large public water systems or that are subject to other county discretionary approval (e.g. Coastal) are not ministerial.
5. Propose maintaining ministerial review for small wells and replacement wells, more extensive discretionary review for new large wells.

# Metering

1. Proposing metering for all new, supplemental, and replacement non-de minimis wells, with installation and reporting the responsibility of the well owner.
2. Well owners would only report to the County if they are not reporting to one of the GSAs
3. Defining de minimis as 2AFY acknowledging that most domestic wells use .35-.5 AFY. This is consistent with other Counties (e.g. Sonoma, Glen), and with SGMA.
4. Could consider a water conservation questionnaire or limit the definition to domestic use- in which case a threshold for irrigated acreage may be needed.

# Regional Monitoring



Information Page

View All Stations

View Stations by Physical Parameters

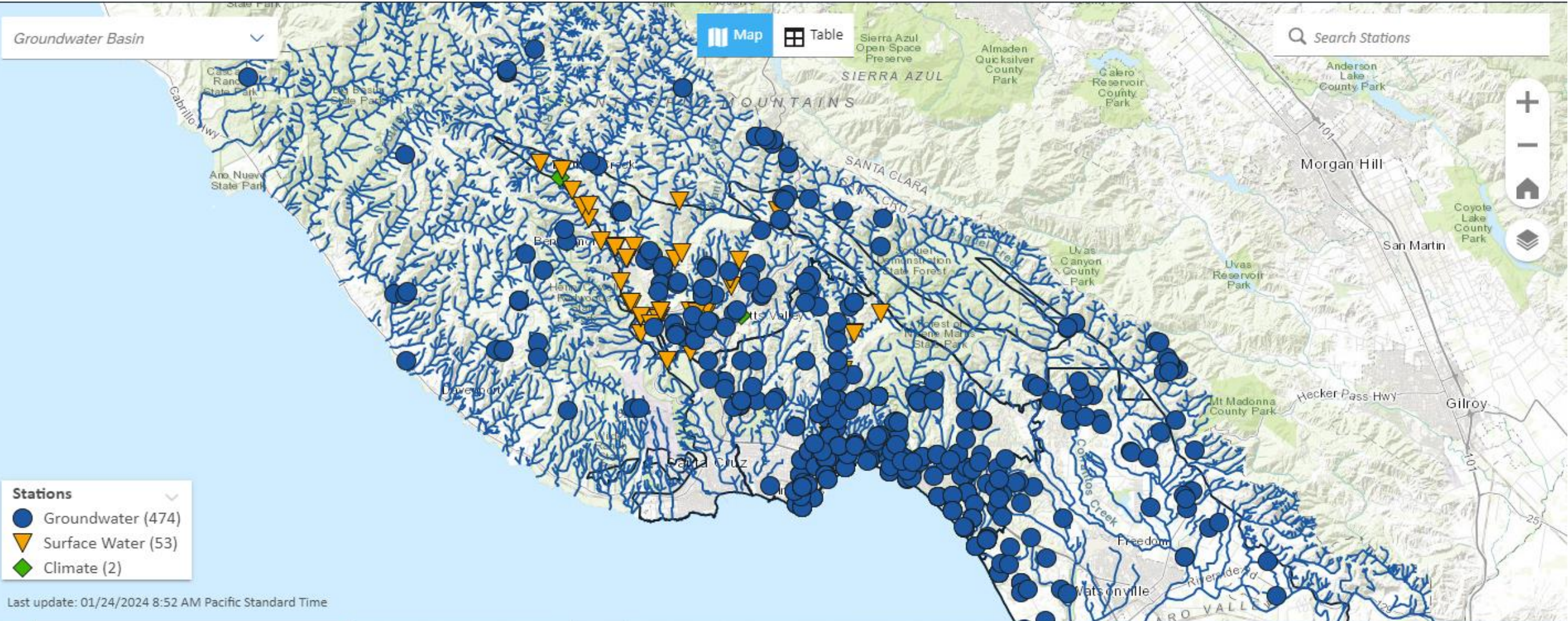
View Stations by Water Quality Parameters

Home > View All Stations

Groundwater Basin

Map Table

Search Stations



- Stations**
- Groundwater (474)
  - ▲ Surface Water (53)
  - ◆ Climate (2)

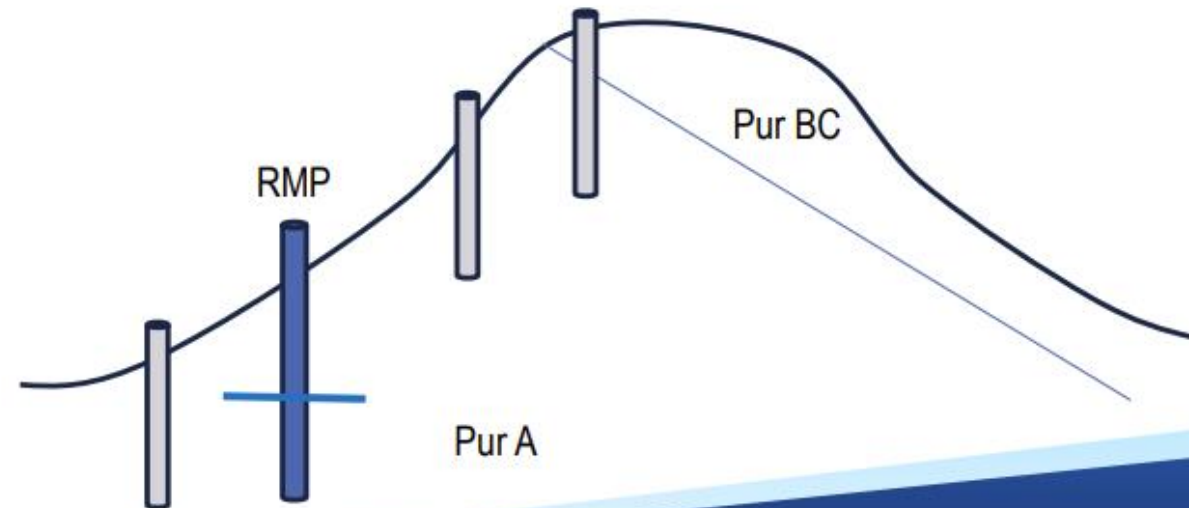
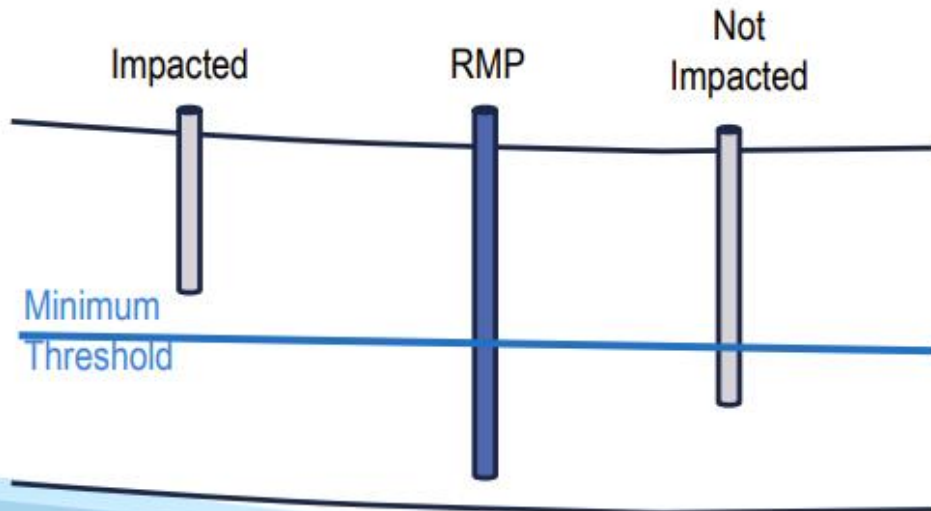
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# Limits to Regional Monitoring

## Address DWR Corrective Action

Identify and quantify potential impacts to domestic wells that the Plan describes as potentially needing to be deepened if groundwater level MTs are reached

- This approach works in alluvial basins with low topography and laterally continuous aquifers
- Does not work for this basin with mountains and dipping stacked aquifers

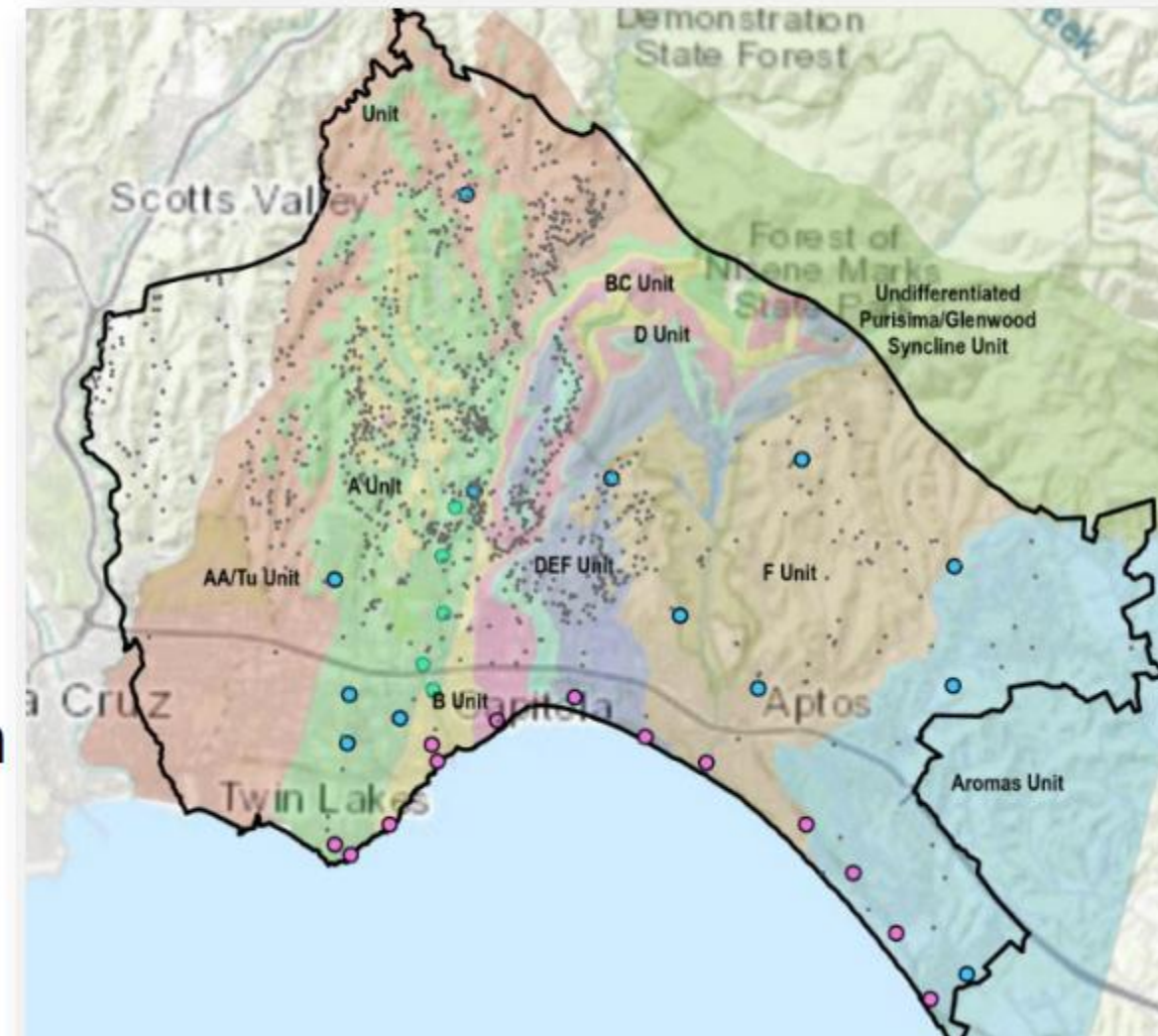


# Limits to Regional Monitoring



## Approach to Address DWR Corrective Action

1. Attempt to analyze the <50 domestic wells within the relatively flat portion of the basin in the area of municipal pumping
2. Describe how land use practices are unlikely to change in the rural domestic well areas so that current balanced long-term groundwater levels are likely to continue
3. Describe how MGA can directly interact with rural domestic well owners if they experience problems



## General Conclusions and Recommendations:



1. Most of the current impact on streamflow in Santa Cruz County is a result of cumulative impact of basin-wide pumping, which is mostly municipal and agricultural. De minimis pumping has had limited impact on streamflow. There is very limited new development in rural areas (10 new domestic well permits/year).
2. Based on the GSPs, new de minimis wells and non-de minimis replacement/supplemental wells with no significant increase in groundwater use are consistent with the GSPs and will have minimal impact on basin sustainability. These can be treated ministerially, with some standard requirements to mitigate impacts on streams and other wells.
3. Non-de minimis wells serving new uses were not factored into the GSPs and will require a higher level of evaluation and potential mitigation.
4. Propose requiring minimum stream setbacks or deep seals for de minimis and replacement wells. Exempt wells near streams or reaches that are not hydraulically connected to groundwater more than 5% of the time (e.g. lower Valencia Creek, lower Corralitos)?
5. General authority to require adequate information for a determination and protective measures will be provided in the code update, with specifics to be defined as policy outside the code. Allows adaptive management.
6. Authority is proposed to deny any well that would conflict with a GSP project (eg. in exclusion zones).

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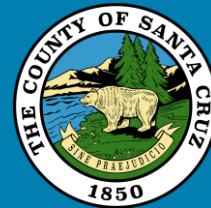


## Next Steps:

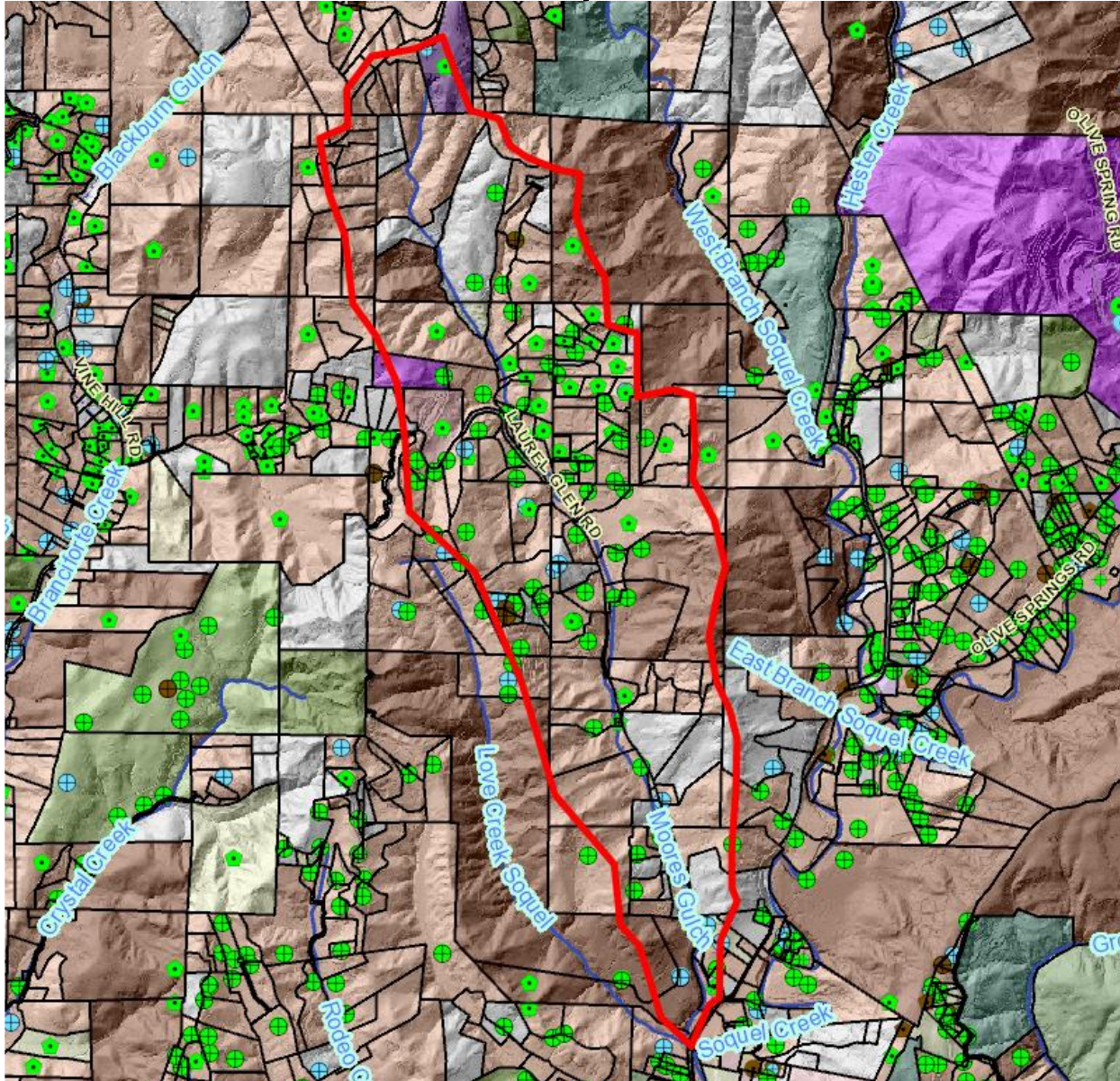


1. Staff will refine proposed draft ordinance and associated policies with comments received by TAC members. Follow-ups with individuals or groups are likely as we do this.
2. County Counsel will review and revise the proposed draft to ensure it is in compliance with all applicable laws and requirements.
3. County staff will work with the EH Land Use Team to assess the impact these proposed changes are likely to have on fees and permit approval times.
4. County staff will reach out to CDI-Planning and Coastal Commission staff for their input
5. Once all those comments have been incorporated, the next TAC meeting will be scheduled.

# Discussion



# Moore's Gulch Example



## Moore' Gulch

### Watershed (in red)

Wells are green and blue. Wells without records are not shown (estimated 10-20%)

Vacant parcels are white, all others are developed.

Average Well Density is 70/sq.mi. (including parcels likely served by unrecorded wells)