
CONSIDERATION OF THE DRAFT SUSTAINABLE MANAGEMENT CRITERIA AND MONITORING NETWORK CHAPTERS

GROUNDWATER SUSTAINABILITY PLAN DEVELOPMENT

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Vina Groundwater Sustainability Agency Board Meeting
July 14, 2021



TODAY

- Groundwater Sustainability Plan development and process
- Overview of public comments and SHAC recommendations
- Seek input and possible recommendation from the Joint GSA Boards:
 1. Direction on desired changes to components of the Sustainable Management Criteria including the Sustainability Goal and the Undesirable Result statement for Declining Groundwater Levels
 2. Recommendation on approach to use to establish Minimum Thresholds for Groundwater Levels in the public review draft of the Groundwater Sustainability Plan to be released in September.

SUSTAINABLE MANAGEMENT CRITERIA CHAPTER

- Draft Sustainable Management Criteria Chapter
 - 30 day public comment period, June 18th deadline
 - Complete Chapter with description of the methodology
 - “Initial” Minimum Thresholds and Measurable Objectives
 - Emphasis on seeking input on where to set Minimum Thresholds and Measurable Objectives, and the Undesirable Results Statements
 - Key Management Decisions, not a Scientific Decision

PROCESS AND ANTICIPATED TIMELINE

- May: Draft Sustainable Management Criteria Chapter Released for 30 Day Public Comment Period
- June: Stakeholder Advisory Committee reviews Draft Chapter and received public comments. Provide recommendation to Vina GSA Board
- July: Vina GSA Board and Rock Creek RD GSA Board- decision making regarding components of the Sustainable Management Criteria
 - Undesirable Results Statements
 - Minimum Thresholds and Measurable Objectives
- The Draft Chapter is revised accordingly for inclusion in the Public Review Draft of the complete GSP for release in September
- Sustainable Management Criteria Chapter not completely final until the entire Groundwater Sustainability Plan is adopted

SUSTAINABLE MANAGEMENT CRITERIA (SMC)

Includes

- Sustainability Goal (qualitative)
- Undesirable Results (quantitative)
- Minimum Thresholds (quantitative)
- Measurable Objectives (quantitative)

Defines what **SUSTAINABILITY** is and looks like in the subbasin

What's considered “significant and unreasonable” is left for the local GSAs and stakeholders to decide. → Management Decision



Lowering
GW Levels



Surface Water
Depletion



Degraded
Quality



Land
Subsidence



Seawater
Intrusion

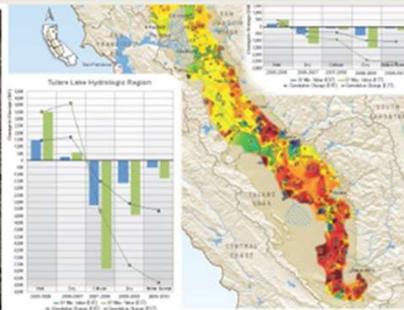


Reduction
of Storage

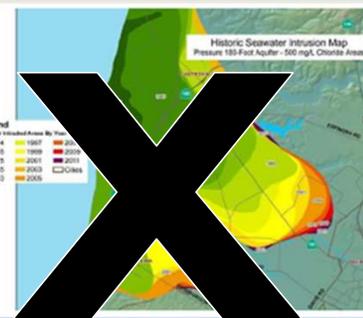
SUSTAINABILITY INDICATORS



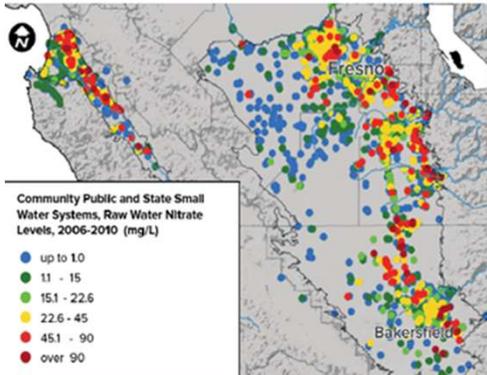
Lowering of GW Levels



Reduction of GW Storage



Seawater Intrusion



Water Quality Degradation



Land Subsidence



Depletion of Interconnected Streams

PUBLIC COMMENTS

All public comments on the draft chapters received to date were compiled and included in the agenda packet.

- A number of comments express concern that the Measurable Objective and/or the Minimum Thresholds for Groundwater Levels are set too low to avoid undesirable results to domestic wells and groundwater dependent ecosystems (GDEs). Comments suggest GDEs should include consideration of upland Valley Oak Woodlands, the urban forest in Chico, and impacts to listed endangered species.
- Comments express support for and a call for additional data and studies to establish the relationship between groundwater levels, streamflow depletion rates, and significant and unreasonable impacts to beneficial uses of surface water, and groundwater dependent ecosystems.
- Comments generally express a preference for the use of polygons and the approach used in North Vina for establishing the Groundwater Level Minimum Thresholds.
- A number of clarification questions on content and process including requests to more clearly define “sustainably constructed wells” and “suitable habitat.”
- Comments expressed the importance of this effort and great concern regarding drought, climate change, water demand, and water transfers compromising the success of sustainable groundwater management.
- Questions regarding outreach efforts and request for a public workshop on this work

SUSTAINABILITY GOAL: GOAL DESCRIPTION

SHAC Recommended:

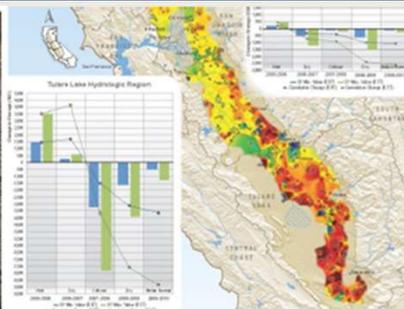
*“To ensure that groundwater is managed to provide a water supply of adequate quantity and quality to support rural areas and **small** communities, the agricultural economic base of the region, and environmental uses now and in the future.”*

In the Spirit of inter-basin coordination, the Wyandotte Creek Advisory Committee made the following recommendation:

To ensure that groundwater is managed to provide a water supply of adequate quantity and quality to support **beneficial users of groundwater including but not limited to** rural areas and **small-other** communities, the agricultural economic base of the region, and environmental **resource** uses **in the Subbasin** now and in the future.

Recommendation from the Joint GSA Boards?

FOCUS TONIGHT: ★ SUSTAINABILITY INDICATORS



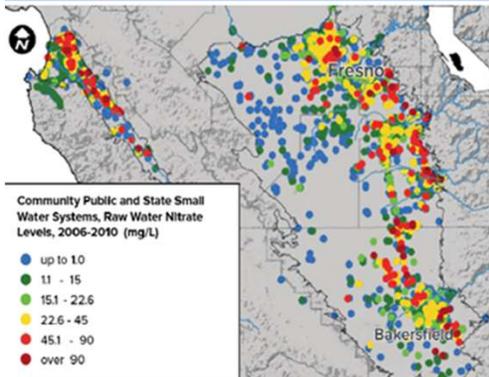
Lowering of GW Levels



Reduction of GW Storage



Seawater Intrusion



Water Quality Degradation



Land Subsidence



Depletion of Interconnected Streams

Groundwater Storage, Water Quality, and Land Subsidence:

- No formal recommendations from the SHAC, general support for approach.
- Few to no public comments

DEPLETION OF INTERCONNECTED SURFACE WATER



 Depletion of Interconnected Streams

Interconnected Surface Water	
Definition	Avoiding significant and unreasonable depletion of surface water flows caused by groundwater pumping that significantly impacts beneficial uses
Identification	Groundwater Level SMC are used by Proxy: Two RMS wells reach their MT for two consecutive non-dry year-types.
Minimum Thresholds	Groundwater Level MTs are used by proxy
Measurable Objectives	The groundwater level based on the groundwater trend line for the dry periods (since 2000) of observed short-term climatic cycles extended to 2030.
Data Gap	Data needed to develop this SMC includes: definition of stream reaches and associated priority habitat, streamflow measurements to develop profiles at multiple time periods, and measurements of groundwater levels directly adjacent to stream channels, first water bearing aquifer zone, and deeper aquifer zones.

DEPLETION OF INTERCONNECTED SURFACE WATER



 Depletion of Interconnected Streams

Integrated assessment of groundwater and surface water is needed:

1. Definition of stream reaches and associated priority habitat.
2. Multiple streamflow measurements in each stream reach to develop a profile of streamflow at multiple time periods over at least one year.
3. Measurement of groundwater levels directly adjacent to the stream channel in the adjacent riparian zone or floodplain.
4. Measurement of groundwater levels in the first water bearing aquifer zone.
5. Measurement of groundwater levels in deeper aquifer zones.

JOINT BOARD RECOMMENDATION?



 Depletion of Interconnected Streams

Interconnected Surface Water	
Definition	<p>Avoiding significant and unreasonable depletion of surface water flows caused by groundwater pumping that significantly impacts beneficial uses</p> <p><i>Wyandotte Creek Advisory Committee recommended: Avoiding significant or and unreasonable depletion of surface water flows caused by groundwater pumping that significantly and unreasonably impacts beneficial uses of groundwater</i></p>
Identification	Groundwater Level SMC are used by Proxy: Two RMS wells reach their MT for two consecutive non-dry year-types.
Minimum Thresholds	Groundwater Level MTs are used by proxy
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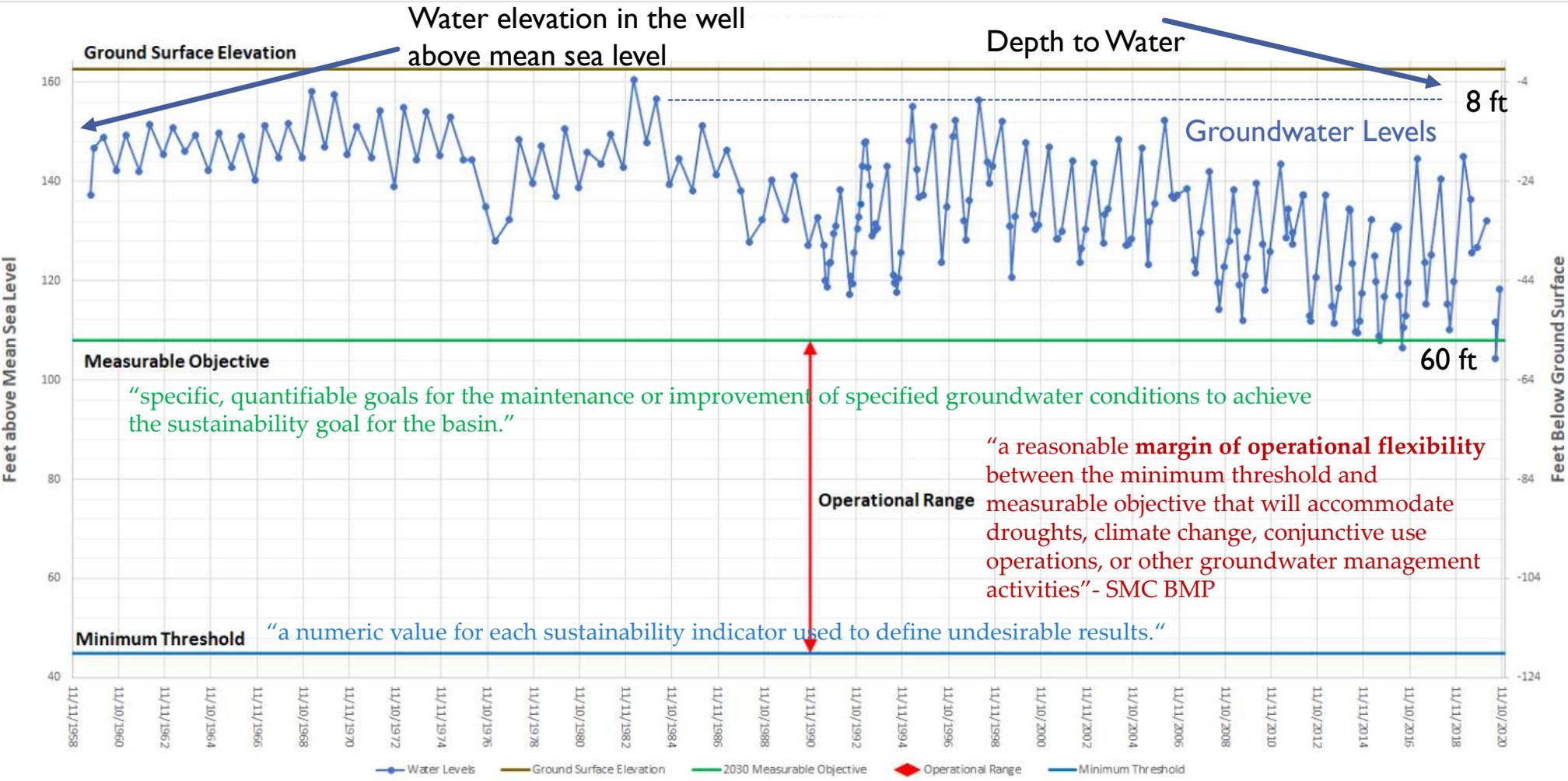
DECLINING GROUNDWATER LEVELS



Lowering of GW Levels

Seeking input on three items:

1. Preferred approach for setting Minimum Thresholds
2. Undesirable Results Definition statement
3. Undesirable Results Identification statement



CHECK POINTS ALONG THE WAY



Interim Milestones



DWR will periodically (at least every five years) review GSPs to determine, among other items, whether failure to meet interim milestones is likely to affect the ability of the GSA(s) in a basin to achieve the sustainability goal.

2027 2032 2037 2042

DECLINING GROUNDWATER LEVELS



Lowering of GW Levels

“Potential impacts identified by stakeholders from declining groundwater levels included:

- Wells going dry
- Reduced pumping capacity of existing wells
- Need for deeper well installations and/or lowering of pumps
- Increased pumping costs due to greater lift
- Reduced flows in rivers and streams supporting aquatic ecosystems
- Water table depth dropping below the maximum rooting depth of Valley Oak (*Quercus lobata*) or other deep-rooted tree species

Shared Data Gap:
Shallow
Groundwater
Monitoring

Issues related to reduced flows in rivers and streams and/or water tables that support deep rooted tree species are addressed in the Interconnected Surface Water SMC (see **Chapter 3.8**).”

MINIMUM THRESHOLD

LOWERING OF GROUNDWATER LEVELS



- **WHERE?** Developed **uniquely** for each Representative Monitoring Site (RMS well)

- **WHY?** Potential Significant and Unreasonable Conditions
“sustainably constructed domestic wells going dry during non-dry year conditions would be a “significant and unreasonable” undesirable result of groundwater management”

- **WHAT?** Supporting Information
 - Depths of nearby domestic wells
 - Historically Observed Groundwater Levels

- **HOW?** Approach
 - Use vulnerability of domestic wells as the “indicator” of “undesirable result”
 - Objective: identify the threshold at an RMS well that is protective of sustainably constructed domestic wells

REPRESENTATIVE MONITORING SITE (RMS) WELLS

Legend

RMS GWE Monitoring Wells

-  Residential
-  Irrigation
-  Observation
-  Municipal and Industrial

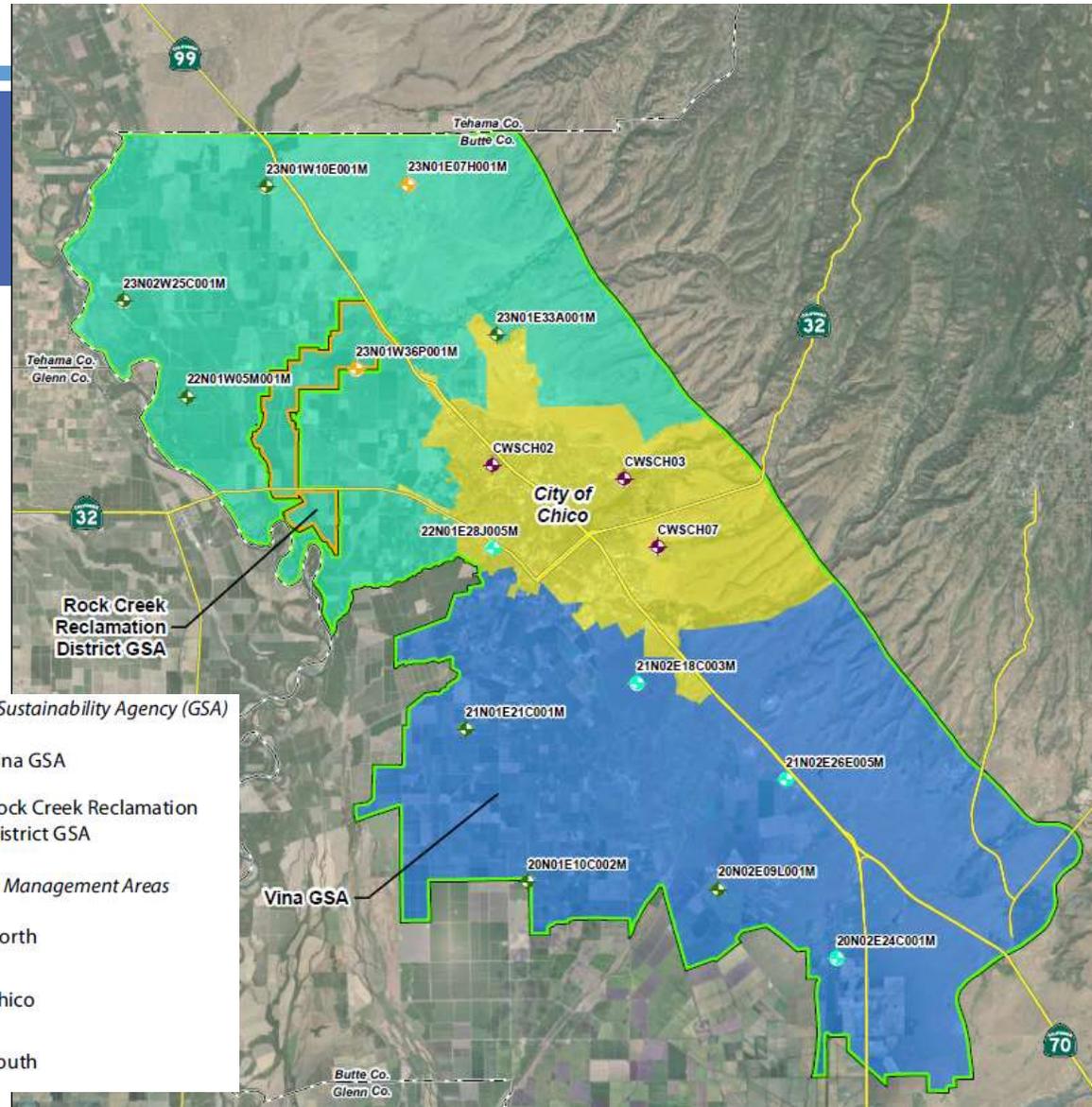
-  Highways
-  County boundaries

Groundwater Sustainability Agency (GSA)

-  Vina GSA
-  Rock Creek Reclamation District GSA

Vina Subbasin Management Areas

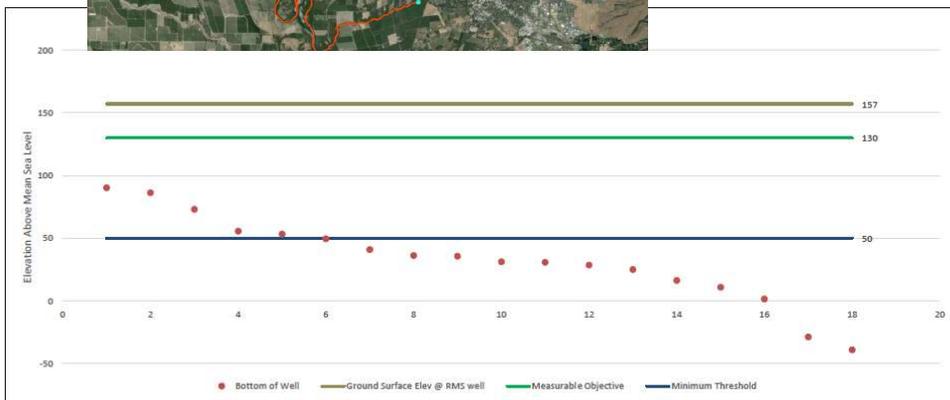
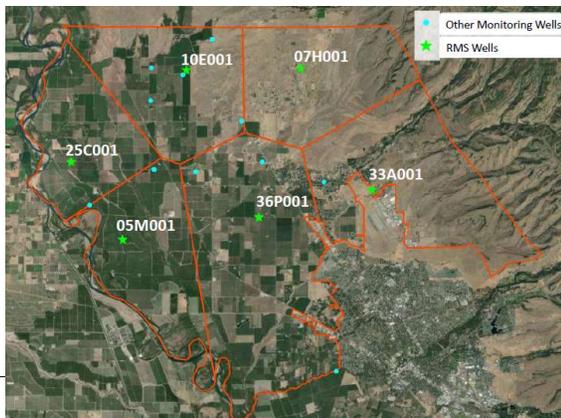
-  North
-  Chico
-  South



Declining Groundwater Levels

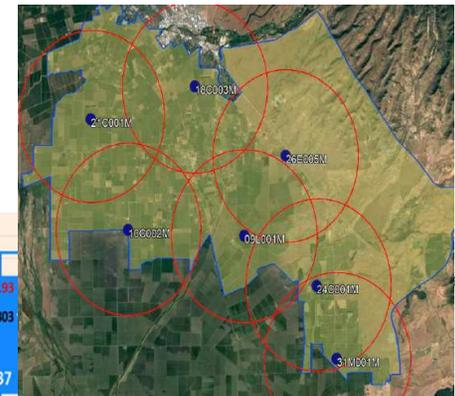
Two Approaches to setting the Minimum Thresholds – Preference?

Vina North Approach



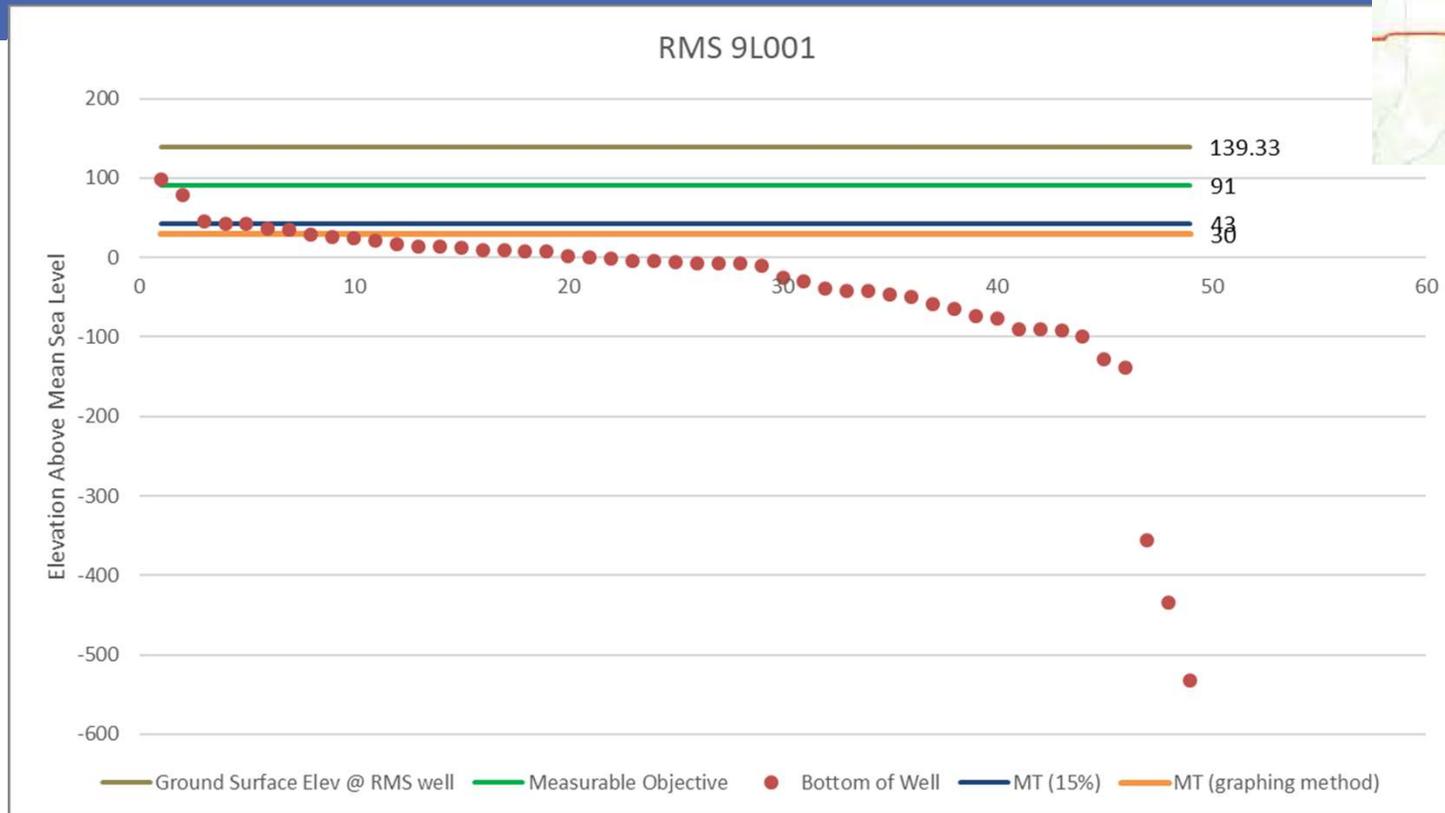
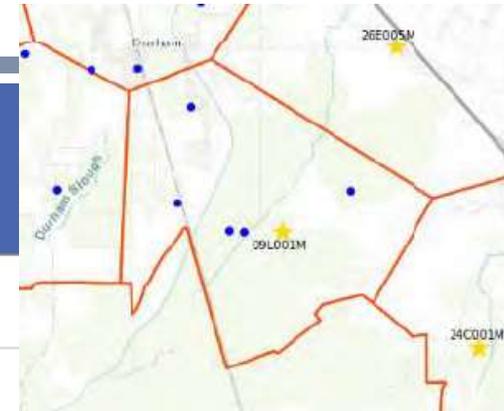
Vina South Approach

- Polygons vs 3-mile radius
- Graphing method vs. 15th percentile



32.74 Total number of domestic wells completed after 1980 located within RMS Well Radius. Does not include wells located outside of the management area.

GRAPHING METHOD EXPLAINED



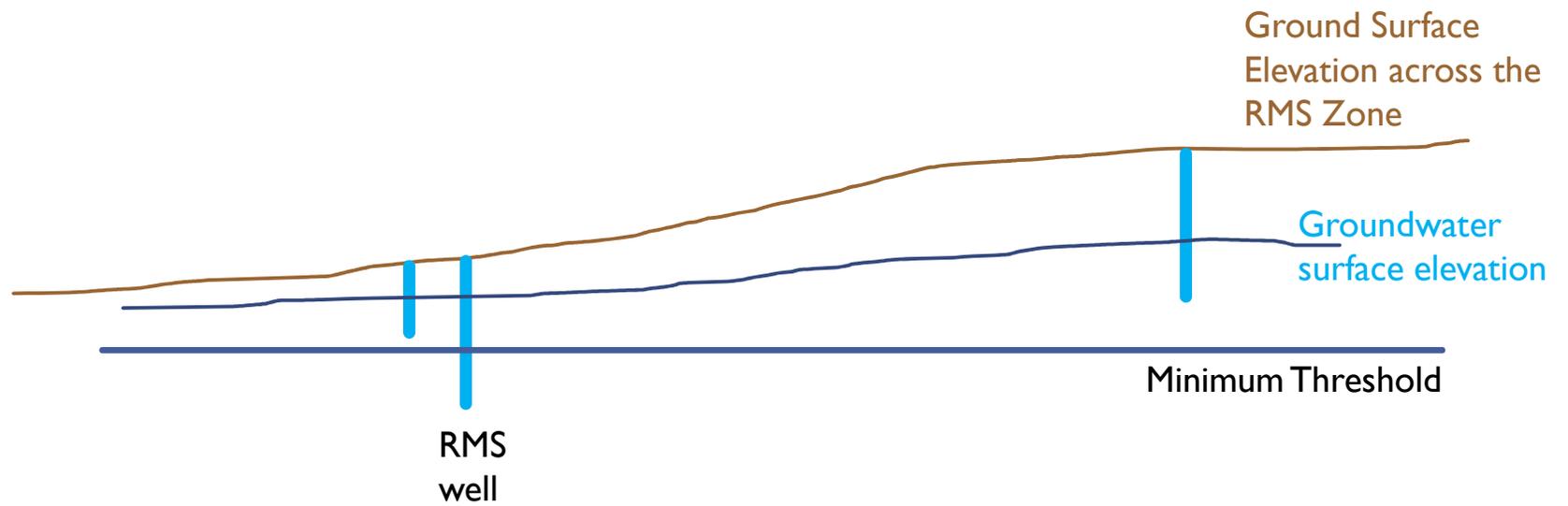
- Each red point is a domestic well located within the polygon for this representative monitoring well

Graphing Method for Establishing the Minimum Threshold

Graphs show the Elevation of the Bottom of domestic wells in the RMS Zone relative to the RMS well's ground surface elevation. Each red point on the graph represents a domestic well in the RMS zone. Everything is converted to elevation above mean sea level in feet. The elevation of the Measurable Objective and Minimum Threshold established at the RMS well is shown relative to the elevation of the bottom of all domestic wells (post 1980 from the well database) within the zone.

The graphs were used to identify the Minimum Threshold that would be protective of the majority of the domestic wells in the RMS zone while recognizing the RMS well is not fully representative of wells within the zone due to changes in ground surface and water surface elevation throughout the area. Wells above the Minimum Threshold elevation tend to be especially shallow (less than 100 feet deep) or have a significantly different (higher) ground surface elevation than the RMS well.

ROUGH EXAMPLE



SUMMARY TABLES FOR NORTH VINA AND SOUTH VINA REPRESENTATIVE MONITORING SITE (RMS) WELLS

North Vina (As presented in Public Review SMC Chapter- graphing method)

RMS Well	25C001	10E001	18A001/ 07H001	05M001	36P001	33A001
Ground Surface Elevation @ RMS well	157	189	252	151	163	252
Measurable Objective	130	136	136	115	108	125
Minimum Threshold	50	80	72	31	45	72
# Wells in RMS Zone	18	21	67	5	329	307
Number of wells above the MO	0	1	8	0	0	40
Number of wells above the MT	5	6	32	2	69	116

South Vina (MT (15%) as presented in Public Review Chapter & Proposed MT (Graphing Method))

RMS Well	21C001M	18C003M	26E005M	10C002M	09L001M	24C001M
Ground Surface Elevation @ RMS well	133	189	182	127	139	158
Measurable Objective	64	130	95	92	91	77
Minimum Threshold (15%)	44	65	57	20	43	33
Operational Range	20	65	38	72	48	44
Minimum Threshold (Graphing Method)	10	65	36	20	30	18
Operational Range	54	65	59	72	61	59
# Wells in RMS Polygon Zone	155	339	45	29	49	12
Number of wells above the MO	5	1	1	0	1	0
Number of wells above the MT (15%)	15	60	11	4	3	2
Number of wells above the MT (graphing)	57	60	15	4	7	4

JOINT GSA BOARD EXAMPLE RECOMMENDATION

- Recommend the polygon approach be used to identify the set of domestic wells associated with each Representative Monitoring Site well
- Recommend that the Minimum Thresholds associated with the [Graphing Method OR 15 Percentile Method](#) be included in the Draft GSP for release in September

Recommendation from the Joint GSA Boards?

SMC FOR DECLINING GROUNDWATER LEVELS AS DOCUMENTED IN THE DRAFT CHAPTER



Lowering of GW Levels

Declining GWL	
Definition	<p>An Undesirable Result is experienced if sustained groundwater levels are too low to provide a water supply of adequate quantity and quality to support rural areas and small communities, and the agricultural economic base of the region, or if significant and unreasonable impacts to environmental uses of groundwater occur.</p> <p><i>Wyandotte Creek Advisory Committee made the following recommendation: An Undesirable Result is experienced if sustained groundwater levels are too low to provide a water supply of adequate quantity and quality to achieve the sustainability goal.</i></p>
Identification	Two RMS wells within a management area reach their MT for two consecutive non-dry year-types .
Minimum Thresholds	S.Vina: 15th percentile of shallowest domestic wells within a 3-mile radius of the RMS well. N.Vina: Elevation protective of sustainably constructed domestic wells within the polygon associated with the RMS well
Measurable Objectives	The groundwater level based on the groundwater trend line for the dry periods (since 2000) of observed short-term climatic cycles extended to 2030.

UNDESIRABLE RESULTS

- Identified by a combination of Minimum Threshold exceedances occurring
- **Defines the Failure Point** of the local GSA and invites intervention by the State Water Resources Control Board
- Absence of undesirable results supports a determination that basin is operating within its sustainable yield and, thus, that the sustainability goal has been achieved.

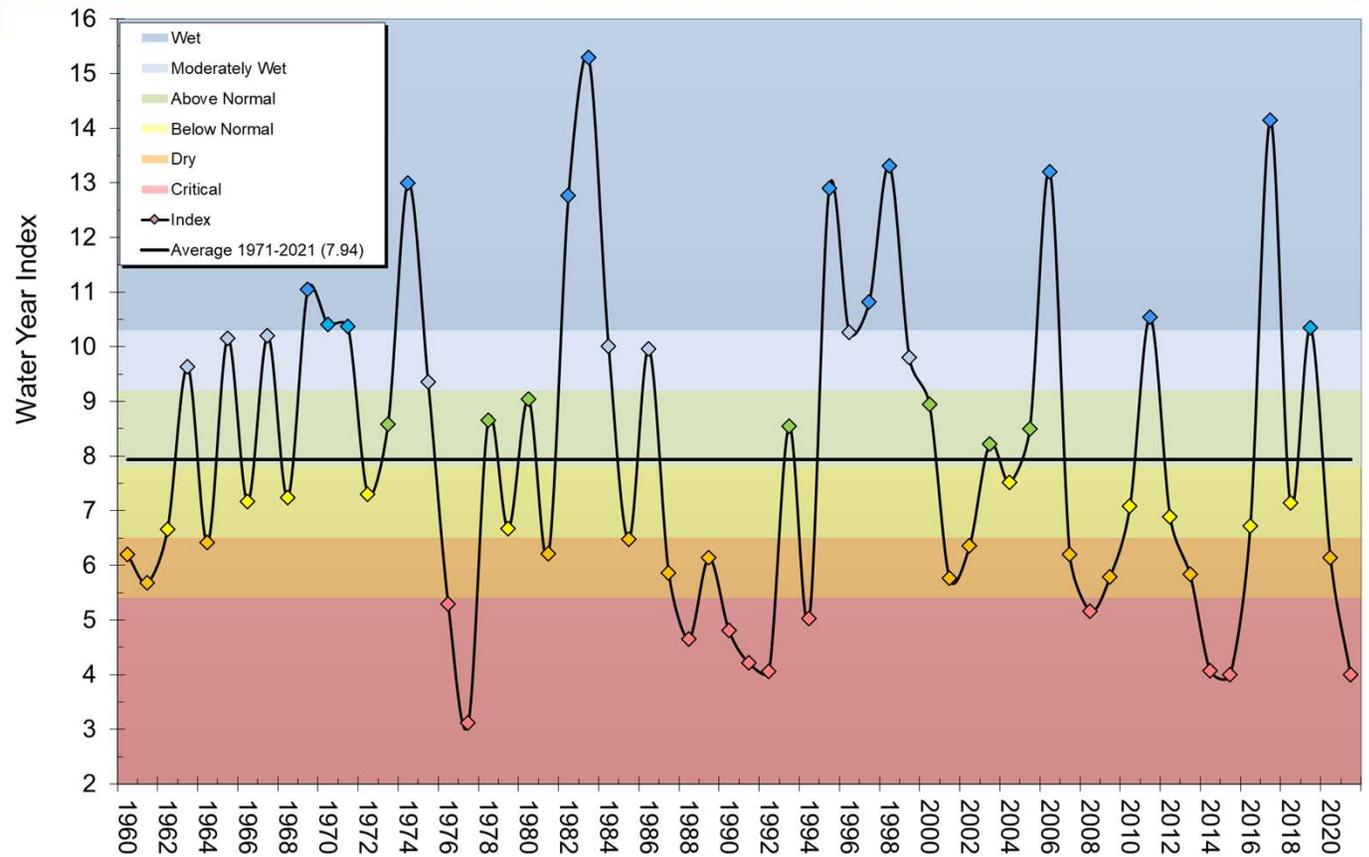
Draft Chapter Language:

“Two RMS wells within a management area reach their Minimum Threshold for two consecutive non-dry year-types.”

WATER YEAR TYPE CLASSIFICATION

Sacramento Valley 40-30-30 Index

- Two dry year types: Dry and Critical



FROM SMC BEST MANAGEMENT PRACTICES



Lowering of GW Levels

-  Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued over the planning and implementation horizon. Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods

JOINT GSA BOARD POSSIBLE RECOMMENDATION

- Recommendation to change the Undesirable Result Definition statement?
- Recommendation to change the Undesirable Result identification statement?

Recommendation from the Joint GSA Boards?

OTHER DISCUSSION OR RECOMMENDATIONS?