



Groundwater Sustainability Plan Development

Public Outreach Meetings for Chapters 5 and 6

July 28, 2021, and July 29, 2021 | 6:00 – 8:00 pm

Opening Remarks

Meeting Agenda

Grant Davids, PE
Davids Engineering

- 1. Groundwater Sustainability Plan (GSP) Overview**
 - GSP Schedule
 - Review of Chapters 1-4
- 2. Chapter 5: Sustainable Management Criteria (SMCs)**
- 3. Chapter 6: Projects & Management Actions (PMAs)**
- 4. Questions and Answers**

GSP Schedule

GSP Chapter/Activity	Activity Start Date	Activity End Date	Activity Duration (days)
Chapter 1 – Introduction			
Chapter 2 – Plan Area	4/7/2021	5/5/2021	28
Chapter 3 – Basin Setting			
Chapter 4 – Monitoring Networks			
Chapter 5 – Sustainable Management Criteria	7/16/2021	8/13/2021	28
Chapter 6 – Projects and Management Actions			
Chapter 7 – Plan Implementation			
Chapter 8 – References and Technical Studies	9/13/2021	10/31/2021	48
Executive Summary			
Complete Draft GSP			
Complete Final GSP	11/1/2021	11/30/2021	30
GSP Adoption by Agencies and Submittal to DWR	12/1/2021	1/31/2022	62

GSP Chapters 1 - 4 Overview

- **Chapter 1: Introduction**

- Purpose of the GSP
- Sustainability Goal
- Agency Information

- **Chapter 2: Plan Area**

- Jurisdictional Boundaries
- Water Resources Monitoring and Management Programs
- Land Use
- Notice and Communication

GSP Chapters 1 - 4 Overview (continued)

- **Chapter 3: Basin Setting**
 - Hydrogeologic Conceptual Model
 - Existing and Historical Groundwater Conditions
 - Water Budget Information

- **Chapter 4: Monitoring Networks**
 - Groundwater Level Monitoring
 - Groundwater Quality Monitoring
 - Land Subsidence Monitoring
 - Surface Water Monitoring

Chapter 5: Sustainable Management Criteria

Ken Loy PG, CEG, CHG

West Yost

Chapter 5 – Sustainable Management Criteria (SMC)

- SMC development approach
- Sustainability indicators
- SMC conceptual framework (driven by State regulations developed to locally implement the Sustainable Groundwater Management Act)
- Example SMC development for key sustainability indicators

SMC Development Approach

- 13 publicly-noticed meetings of Technical Advisory Committees appointed by the Colusa and Glenn Groundwater Authorities over 14 months
 - “Joint TAC” meetings usually 3 hours long
- Supporting technical analyses and guidance from the GSP Consultant Team
- TAC recommendations to the CGA and GGA Boards
- Adoption by respective Boards
- Robust, inclusive process

Sustainability Indicators

1. Chronic Lowering of Groundwater Levels
2. Reduction of Groundwater Storage
3. Seawater Intrusion*
4. Degraded Water Quality
5. Land Subsidence
6. Depletions of Interconnected Surface Water

** Seawater Intrusion was assessed and determined to be not applicable; undesirable results are not occurring and are unlikely to occur in the Colusa Subbasin.*

SMC Conceptual Framework

- Establish a sustainability goal **for the subbasin**
- Describe undesirable results (UR) in terms of “significant and unreasonable” effects on groundwater conditions **for each sustainability indicator**
 - Causes of groundwater conditions leading to URs
 - Criteria used to define when and where effects of groundwater conditions cause undesirable results
- Establish quantitative groundwater management criteria for each applicable sustainability indicator to avoid URs
 - Minimum thresholds
 - Measurable objectives

Colusa Subbasin Sustainability Goal

...to maintain, through a cooperative and partnered approach, locally managed sustainable groundwater resources to preserve and enhance the economic viability, social well-being and culture of all beneficial uses and users, including domestic, agricultural, municipal, environmental, tribal, and industrial, without experiencing undesirable results by managing use within the sustainable yield.

- SMCs were developed to maintain sustainability over the planning and implementation horizon of the GSP.
- SMCs will evolve through adaptive management and as knowledge of the Colusa Subbasin increases.

Undesirable Results

- Occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the subbasin.
- Description
 - Causes of groundwater conditions leading to undesirable results
 - Criteria (combination of minimum thresholds) used to define when and where the effects of groundwater conditions cause undesirable results
 - Potential effects on beneficial uses and users

Example: Chronic Lowering of Groundwater Levels

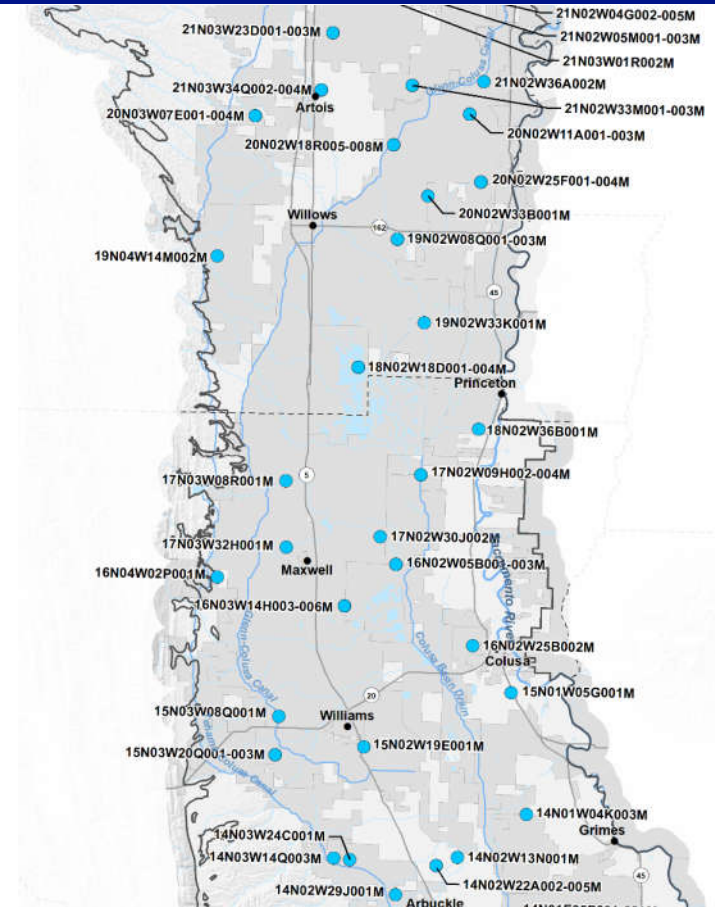
Description of Undesirable Results

- Experienced if sustained groundwater levels are too low to reasonably satisfy beneficial uses within the Subbasin over the planning and implementation horizon of the GSP
- Potential Effects
 - A significant and unreasonable:
 - Number of wells going dry
 - Reduction in the pumping capacity of existing wells
 - Increase in the need for deeper wells or lower pump settings
 - Adverse impacts to environmental uses and users, including reductions in the flows of interconnected surface waters and reductions in groundwater available to the root zones of groundwater-dependent ecosystems (GDEs)

Example: Chronic Lowering of Groundwater Levels Sustainable Management Criteria

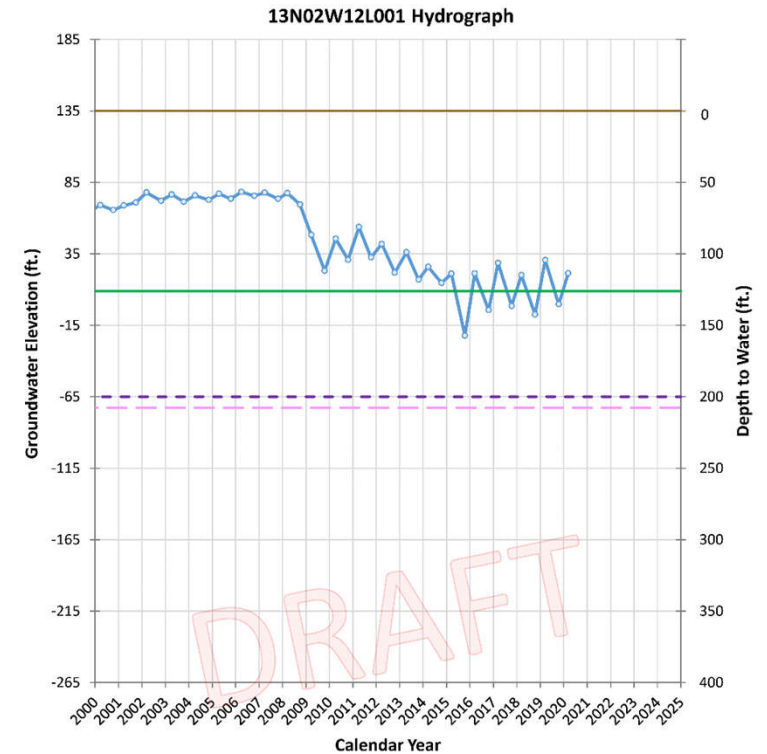
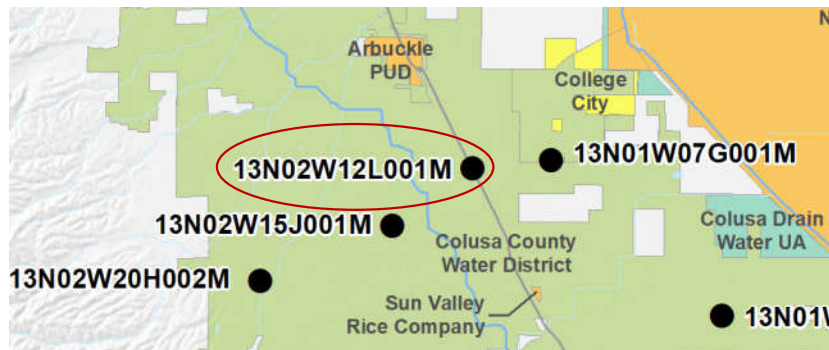
For each of 48 Representative Monitoring Network (RMN) Wells:

- Minimum Thresholds are the lower of:
 - 50 percent of the historical range in observed water levels below the observed low water level, AND,
 - 20th percentile depth of domestic wells in the area represented by each monitoring well.
- Measurable Objectives are the average of the most recent five (5) years of available groundwater levels.
- An Undesirable Result occurs when levels in 25 percent or more (at least 12) of the RMN wells fall below their respective Minimum Thresholds continuously for 24 months.
- CGA: Approved May 25, 2021
- GGA: Approved June 16, 2021



Example: Chronic Lowering of Groundwater Levels Hydrograph and SMCs for RMN Well 13N02W12L001

- Minimum Threshold: 208 feet
 - Set at 50 percent of range below historic low
- Measurable Objective: 126 feet



GSE: 135.49 ft. amsl
 Screen Interval: NA ft. bgs
 MO Date Range: 3/10/2015 - 3/10/2020
 Measurable Objective: 126 ft. bgs
Alternative Minimum Thresholds (bgs):
 20th Percentile of Nearby Domestic Wells: 200 ft.
 50% of Range Below Historic Low: 208 ft.

Summary of Sustainable Management Criteria

Sustainability Indicator	Monitoring Network	Undesirable Result	Minimum Threshold	Measurable Objective
Chronic Lowering of Groundwater Levels	48 Representative Monitoring Network (RMN) wells monitored at least 2-3 times annually by DWR	25% (12 of 48) RMN wells fall continuously below the minimum threshold for 24 consecutive months	The lower of 50% of measured historical groundwater elevation range below the historical measured low elevation and the elevation corresponding to the 20th percentile of domestic well depths in the RMN well's Thiessen polygon, subject to interbasin coordination and consistency to ensure operational compatibility	Mean of last 5 years available groundwater elevation measurements subject to interbasin coordination and consistency to ensure operational compatibility. A fixed value, not a rolling average.
Reduction in Groundwater Storage	48 RMN wells monitored at least 2-3 times annually by DWR (same as Groundwater Level monitoring network)	Use groundwater levels as proxy	Use groundwater levels as proxy	Use groundwater levels as proxy
Degraded Groundwater Quality	23 RMN wells monitored by others at variable intervals under existing State of California regulatory programs.	Electrical conductivity (EC) in 25 % (6 of 23) of the RMN wells exceeds the Minimum Threshold for two (2) consecutive years.	The higher of EC of 900 μ S/cm (the recommended California Secondary Maximum Contaminant Level) OR the pre-2015 historical maximum measured EC.	EC of 700 μ S/cm (corresponding to an agricultural water quality objective providing for no yield reduction for crops commonly grown in the Colusa Subbasin).
Land Subsidence	Existing Sacramento Valley Height Modernization Project (SVHMP) benchmarks (60 sites)	15% or more (9 of 60) monitoring sites (benchmarks) experience subsidence rates above the MT	Benchmarks with greater than 1 foot historical subsidence (measured between 2008 and 2017): set MT at 0.60 foot/year. Benchmarks with less than 1 foot historical subsidence (measured between 2008 and 2017): set MT at 0.50 foot/year.	Benchmarks with greater than 1 foot historical subsidence (measured between 2008 and 2017): set MT at 0.25 foot/year. Benchmarks with less than 1 foot historical subsidence (measured between 2008 and 2017): set MT at 0.25 foot/year.
Depletions of Interconnected Surface Waters	12 RMN wells less than 200 feet deep and between 2,000 feet and five miles of interconnected stream (Sacramento River, Colusa Basin Drain, Stony Creek)	25% (3 of 12) RMN wells fall below their MT for 24 consecutive months.	Ten (10) feet below the observed fall 2015 groundwater level. (Fall 2015 level is the measured elevation recorded on the date closest to Oct 15.)	Mean of last 5 years available groundwater elevation measurements subject to interbasin coordination and consistency to ensure operational compatibility. A fixed value, not a rolling average.

Chapter 6: Projects and Management Actions

Grant Davids, PE

Davids Engineering

Chapter 6: Projects and Management Actions (PMAs)

- PMA development approach
- Overview of PMAs in draft chapter
- Adding and implementing PMAs
- Questions & answers

PMA Development Approach

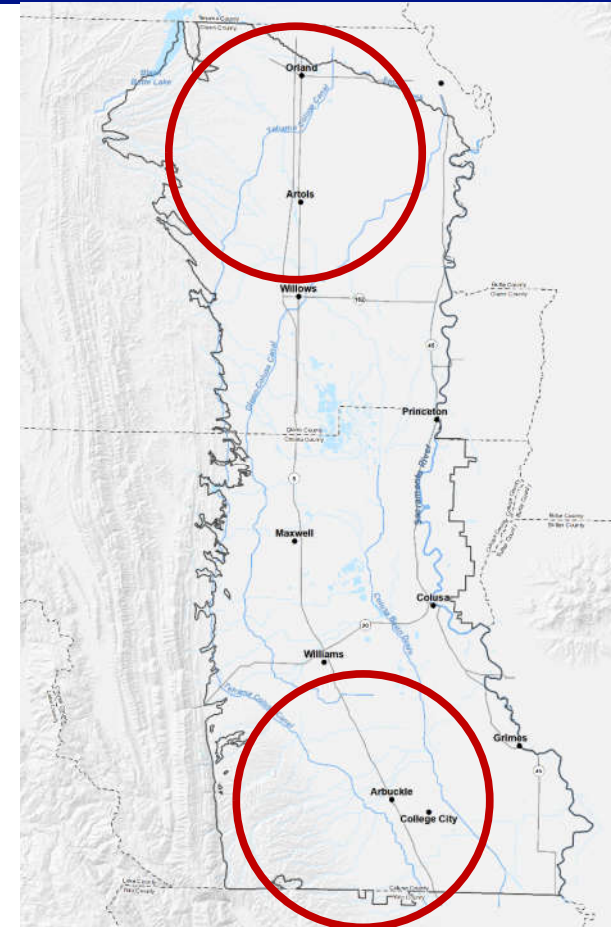
- SGMA requires that GSPs shall *“include a description of the projects and management actions the Agency has determined will achieve the sustainability goal of the basin, including projects and management actions to respond to changing conditions in the basin.”* (23 CCR § 354.44)
 - Paraphrased, the sustainability goal is a commitment to meeting the needs of all beneficial water uses and users while operating within the SMCs that were just presented
 - Potential changes in future conditions must be considered

PMA Development Approach (continued)

- Modeling of future conditions indicates the Colusa Subbasin might be slightly out of balance over the long-term depending on the effects of climate change (Chapter 3)
 - Highly uncertain
- Current drought is more compelling than uncertain future effects
- Approach
 - Implement certain PMAs ASAP primarily to mitigate current drought effects recognizing those PMAs will contribute to sustainable groundwater management over the long term
 - Adaptive management: Monitor groundwater conditions and fine tune PMA implementation (when, where, and at what scale to implement projects?)

Drought Effects and Primary Affected Areas

- Drought effects
 - Reduced precipitation
 - Reduced surface water supplies
 - Increased irrigation demands
 - Increased groundwater pumping
 - Declining GW levels
- Primary affected areas
 - NW area of the Glenn County portion of the subbasin
 - SW area of the Colusa County portion of the subbasin

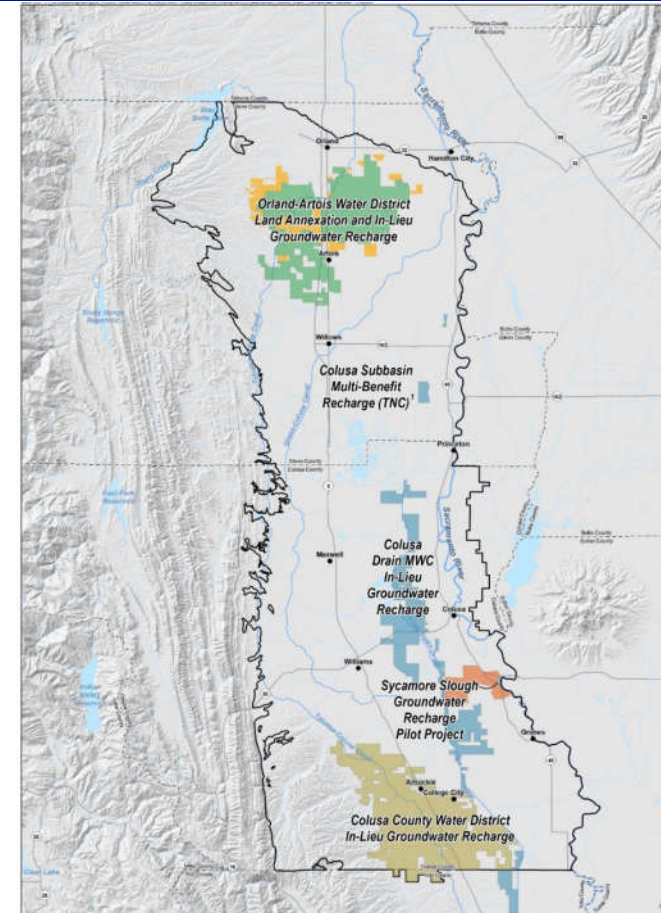


33 Projects and Management Actions in Draft GSP Chapter 6

- **Planned PMAs (5)**
 - Project proponents working to implement at this time
 - Detailed descriptions
- **Ongoing PMAs (6)**
 - Existing projects that are temporary and could be continued, or are limited in scope and could be expanded
 - Summary descriptions
- **Potential PMAs (22)**
 - Conceptual
 - Will be evaluated and developed further based on monitoring of PMA performance and groundwater conditions
 - Summary descriptions

Planned PMAs (5)

1. Colusa Subbasin Multi-Benefit Groundwater Recharge
2. Sycamore Slough Groundwater Recharge Pilot Project
3. Orland-Artois Water District Land Annexation and Groundwater Recharge
4. Colusa County Water District In-Lieu Groundwater Recharge
5. Colusa Drain Mutual Water Company In-Lieu Groundwater Recharge



In-Lieu Recharge Projects Are Compelling

- Advantages
 - Rely primarily on existing infrastructure
 - No new authorities required
 - Scalable based on monitoring of groundwater conditions
- Challenges
 - Availability and cost of supplemental surface water via transfers
 - Making surface water use more attractive than groundwater use

Ongoing and Potential PMAs

- Ongoing PMAs
 - 5 projects
 - 1 management action
- Potential PMAs
 - 15 projects
 - 7 management actions
- Described in draft Chapter 6

Adding and Implementing PMAs

- PMAs can be added anytime
 - January 31, 2022, is the starting line, not the finish line
- PMA Proponents
 - Colusa and Glenn Groundwater Authorities (either separately or together)
 - Existing and potential newly-formed districts
 - Landowners/coalitions of landowners
 - Cities and counties
 - IRWM groups
 - Interested parties
 - State and federal agencies (potential PMA partners)
 - **Collaborative combinations of the above**

Questions and Answers

Public Review of Draft Chapters 5 and 6

- Download and comment on draft chapters
 - <https://colusagroundwater.org/projects/groundwater-sustainability-plan/>
 - <https://www.countyofglenn.net/resources/plans-groundwater-authority-water/colusa-subbasin-groundwater-sustainability-plan-draft-0>
- Comments due August 13, 2021
- Questions and additional information?

Mary Fahey

Program Manager
Colusa Groundwater Authority
530.458.0719 office
mfahey@countyofcolusa.org

Lisa Hunter

Program Manager
Glenn Groundwater Authority
530.934.6540 office
lhunter@countyofglenn.net

Closing Remarks