CMA

Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

# October 2020 HCM Stakeholder Workshop

STETSON ENGINEERS INC.

DUDEK

Geosyntec consultants
engineers | scientists | innovators

# Housekeeping

- Recording the meeting for the purpose of capturing public feedback
- Recording can be made available upon request
- Opportunities for public feedback and questions throughout the workshop
- Public comments on the HCM should be submitted to the website:

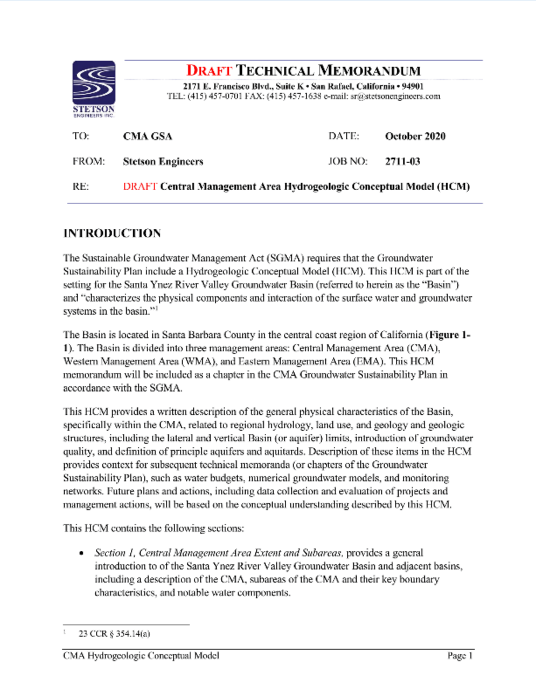
www.santaynezwater.org

# Schedule


Groundwater Sustainability Plan Development Milestones
Groundwater Sustainability Agency Committee Public Meeting
Technical Memorandum
2020
2021
2022
Oct, Nov & Dec Meetings
Groundwater Sustainability Plan Implementation, Annual Reporting and 5-Year Updates
Public comment on Draft Groundwater Sustainability Plan
Hydrogeological Conceptual Model
Groundwater Conditions
Water Budget
Numerical Groundwater Model
Geological Model (completed)
Data Compilation (completed)
Data Management Plan (completed)
Stakeholder Communication and En- gagement Plan (completed)
Monitoring Network
Sustainability Goals, Undesirable Results, Minimum Thresholds and Measurable Objectives
Projects and Management Actions
Draft Groundwater Sustainability Plan
Submit Final Adopted Groundwater Sustainability Plan to California Department of Water Resources

# CMA GSA Special Meeting Agenda

1. Hydrogeological Conceptual Model (HCM) Workshop
    - Document Overview
    - Facilitated Q & A Discussion
2. Path Forward Schedule
    - Additional GSA Special Meetings
    - SkyTEM Flight Update
    - Opportunities for Public Engagement



STETSON ENGINEERS INC.

**DRAFT TECHNICAL MEMORANDUM**

**2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901**
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: sr@stetsonengineers.com

| | | | |
|---|---|---|---|
| TO: | **CMA GSA** | DATE: | **October 2020** |
| FROM: | **Stetson Engineers** | JOB NO: | **2711-03** |
| RE: | DRAFT **Central Management Area Hydrogeologic Conceptual Model (HCM)** | | |

**INTRODUCTION**

The Sustainable Groundwater Management Act (SGMA) requires that the Groundwater Sustainability Plan include a Hydrogeologic Conceptual Model (HCM). This HCM is part of the setting for the Santa Ynez River Valley Groundwater Basin (referred to herein as the "Basin") and "characterizes the physical components and interaction of the surface water and groundwater systems in the basin."[1]

The Basin is located in Santa Barbara County in the central coast region of California (**Figure 1-1**). The Basin is divided into three management areas: Central Management Area (CMA), Western Management Area (WMA), and Eastern Management Area (EMA). This HCM memorandum will be included as a chapter in the CMA Groundwater Sustainability Plan in accordance with the SGMA.

This HCM provides a written description of the general physical characteristics of the Basin, specifically within the CMA, related to regional hydrology, land use, and geology and geologic structures, including the lateral and vertical Basin (or aquifer) limits, introduction of groundwater quality, and definition of principle aquifers and aquitards. Description of these items in the HCM provides context for subsequent technical memoranda (or chapters of the Groundwater Sustainability Plan), such as water budgets, numerical groundwater models, and monitoring networks. Future plans and actions, including data collection and evaluation of projects and management actions, will be based on the conceptual understanding described by this HCM.

This HCM contains the following sections:

- *Section 1, Central Management Area Extent and Subareas,* provides a general introduction to of the Santa Ynez River Valley Groundwater Basin and adjacent basins, including a description of the CMA, subareas of the CMA and their key boundary characteristics, and notable water components.

[1] 23 CCR § 354.14(a)

CMA Hydrogeologic Conceptual Model Page 1

# HCM Workshop

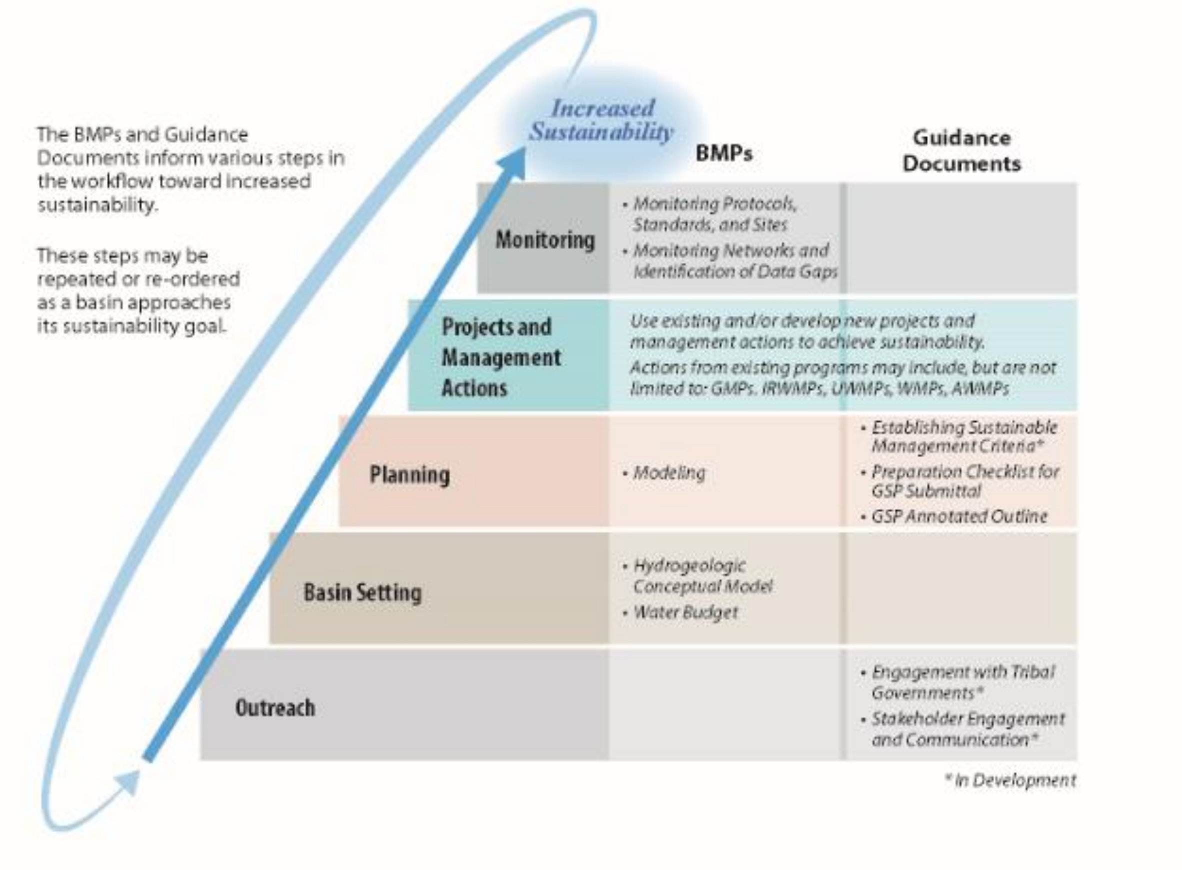



Figure 2. Logical Progression of Basin Activities Needed to Increase Basin Sustainability

**Goals of Meeting**

- Understand SGMA regulations and requirements for a compliant HCM
- Understand HCM document chapters and how the requirements are met
- Provide opportunity for public engagement and feedback on the draft HCM

HCM = Hydrogeologic Conceptual Model

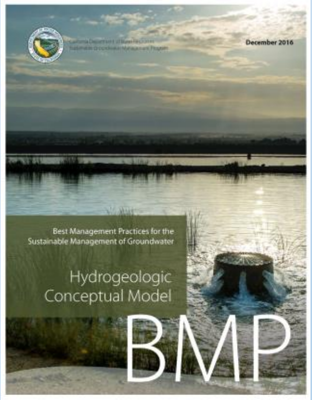
# Hydrogeologic Conceptual Model (HCM)

*Describes the conceptual understanding of the general physical characteristics of the groundwater basin. Part of the Regulations "Subarticle 2. Basin Setting" which also includes Groundwater Conditions (§ 354.16), Water Budget (§ 354.18), and Management Areas (§ 354.20) to be addressed in later documents and meetings.*

The Hydrogeological Conceptual Model consists of:

- Written narrative description

- Graphics that clearly portray the geographic and climatic setting, regional geology and structures, groundwater basin geometry, general groundwater water quality, and consumptive water uses in the basin.

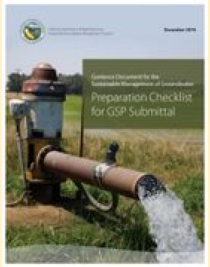



**Hyperlink to DWR Guidance Documents:**
https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents

Reference: BMP-3: Hydrogeologic Conceptual Model

# Explanation / Key for subsequent slides

## DWR Checklist Requirements for HCM




2.2.1 **Hydrogeologic Conceptual Model** ***(Reg. § 354.14)***

- Graphical and narrative description of the physical components of the basin
- [Minimum] two scaled cross-sections
- Map(s) of physical characteristics
  - Topographic information
  - Surficial geology
  - Soil characteristics
  - Delineation of existing recharge areas that substantially contribute to the replenishment of the basin, potential recharge areas, and discharge areas
  - Surface water bodies
  - Source and point of delivery for local and imported water supplies

DWR (2016) Groundwater Sustainabilit
Guidance Document for the Sustainabl

The DWR Checklist is a summary of some key requirements for an HCM, as written in the SGMA regulations

## SGMA Regulations

### § 354.14. Hydrogeologic Conceptual Model

(a) Each Plan shall include a descriptive hydrogeologic conceptual model of the basin based on technical studies and qualified maps that characterizes the physical components and interaction of the surface water and groundwater systems in the basin.
(b) The hydrogeologic conceptual model shall be summarized in a written description that includes the following:
(1) The regional geologic and structural setting of the basin including the immediate surrounding area, as necessary for geologic consistency.
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(E) Identification of the primary use or uses of each aquifer, such as domestic,

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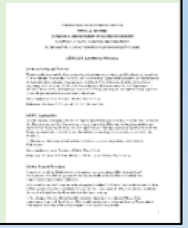
(5) Surface water bodies that are significant to the management of the basin.
(6) The source and point of delivery for imported water supplies.

§ 354.16. Groundwater Conditions

(g) Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.

These are the SGMA regulations which describe the full list of requirements for preparing a compliant HCM



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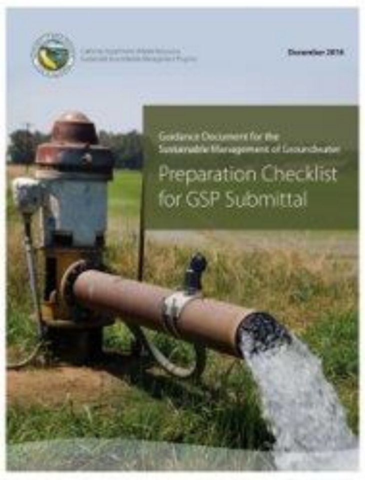


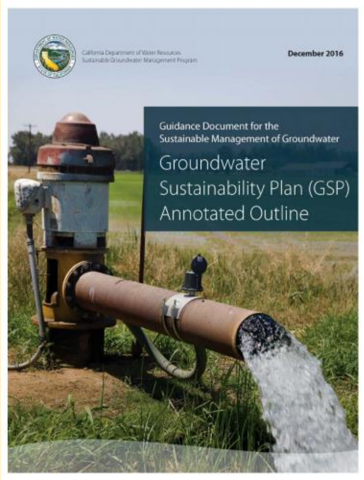


**Hyperlink to DWR Guidance Documents:**
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(E) Identification of the primary use or uses of each aquifer, such as domestic, irrigation, or municipal water supply.

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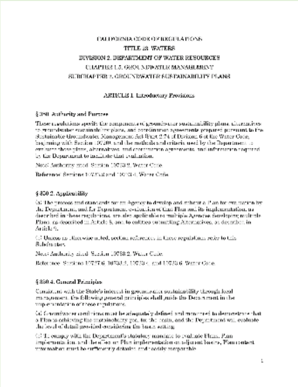
**Hyperlink to Regulations:**
https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I74F39D13C76F497DB40E93C75FC716AA&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)


TITLE 23. WATERS
DIVISION 2. DEPARTMENT OF WATER RESOURCES

# *Questions?*

# HCM Section 1:
# *Central Management Area Extent and Subareas*

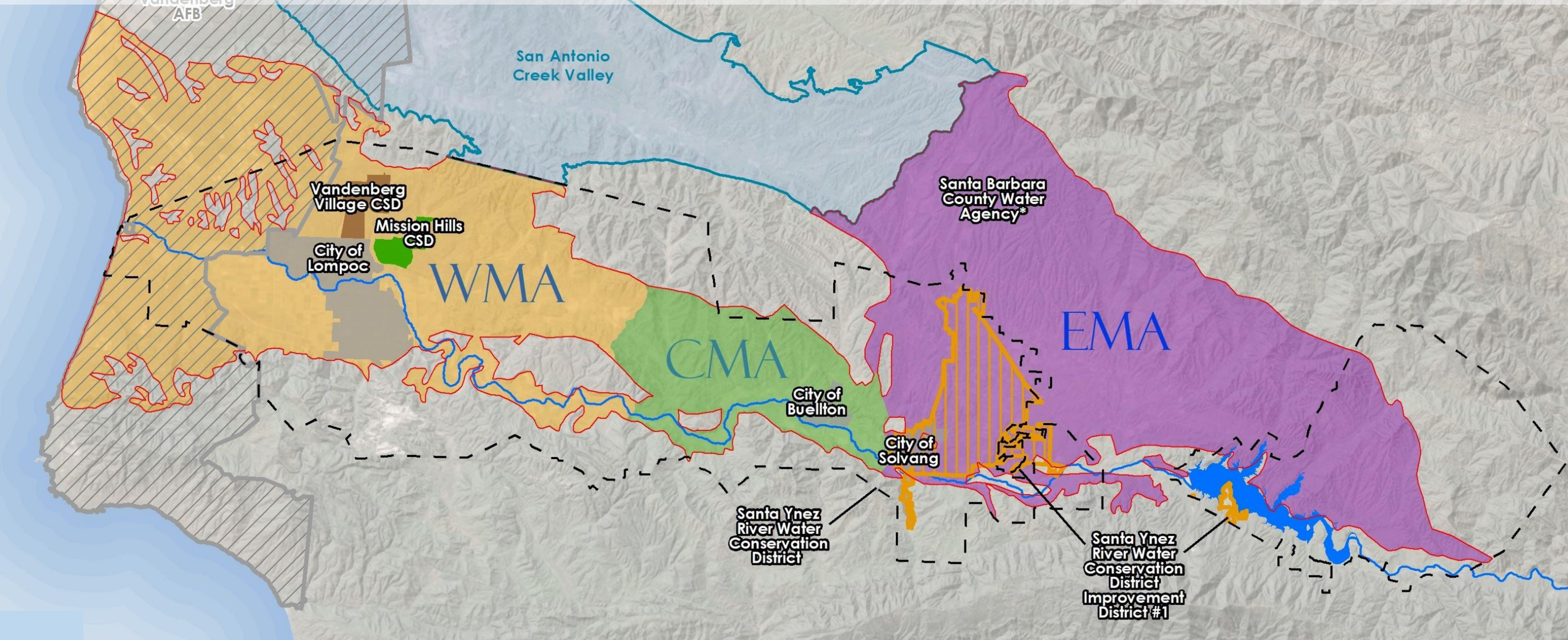
Section provides a general introduction to the Santa Ynez River Valley Groundwater Basin, key Central Management Area (CMA) boundary characteristics, and notable CMA water components.

**Highlights:**

- Santa Ynez River Valley Groundwater Basin Boundary
- Adjacent Groundwater Basins
- CMA Boundary
- CMA Subareas

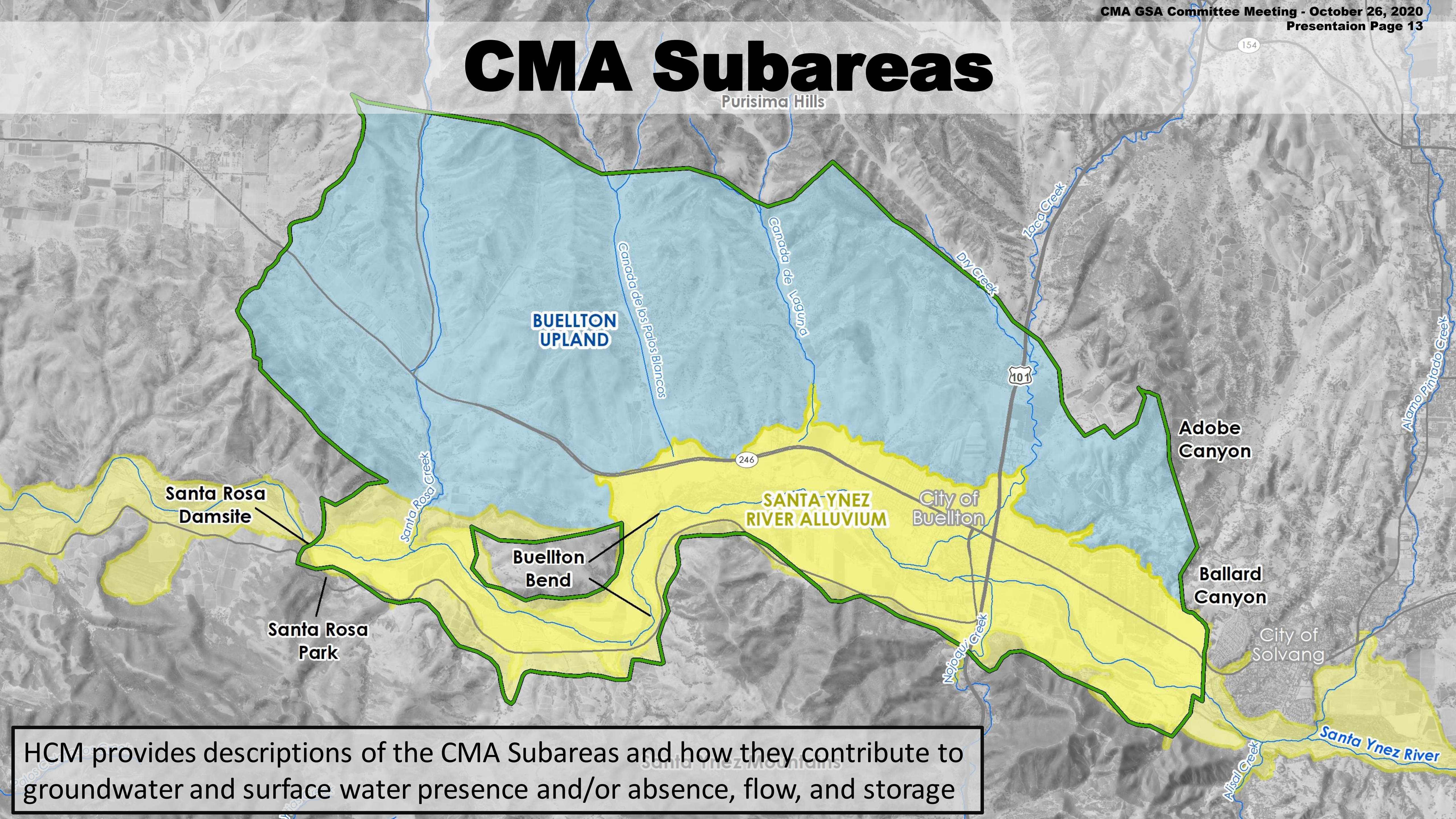
**Next two figures were presented and discussed in August 2020 CMA GSA Meeting**

# Basin, Management Areas, & Adjacent Basin



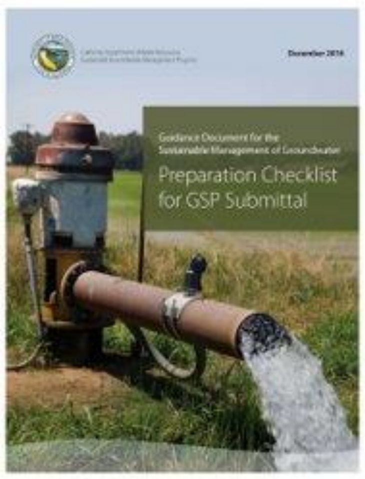

Updated Aug. 2020, includes WMA/CMA/EMA boundary updates.

# CMA Subareas




HCM provides descriptions of the CMA Subareas and how they contribute to groundwater and surface water presence and/or absence, flow, and storage

# HCM Section 1:
# *CMA Extent and Subareas*

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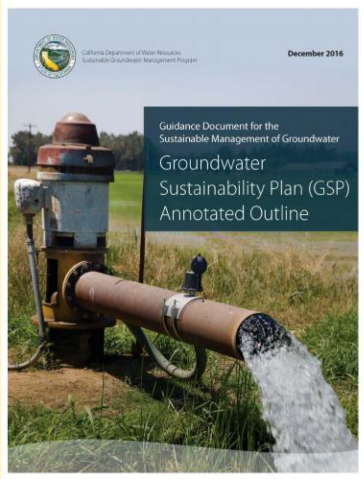


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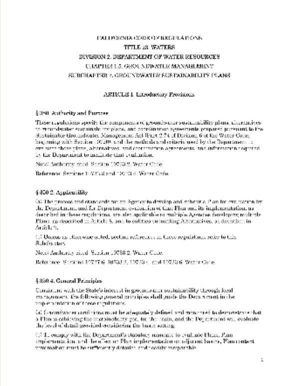
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SUBCHAPTER 2. GROUNDWATER SUSTAINABILITY PLANS

ARTICLE 1. Introductory Provisions

# HCM Section 1:
## Central Management Area Extent and Subareas

Questions?

# HCM Section 2:
# *CMA and Adjacent Geology*

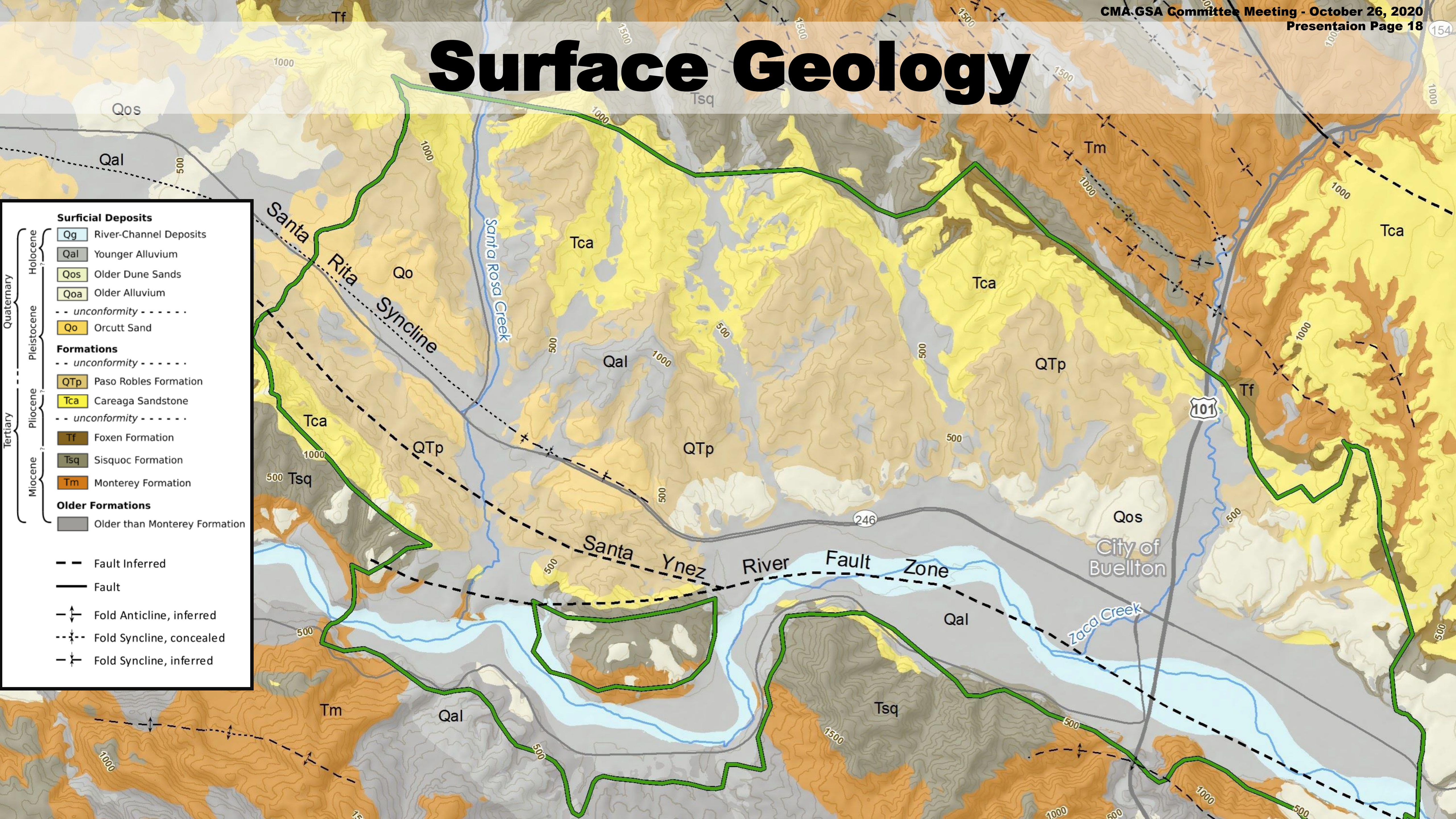
*Section* provides an introduction and overview of the geology of the CMA

**Highlights:**

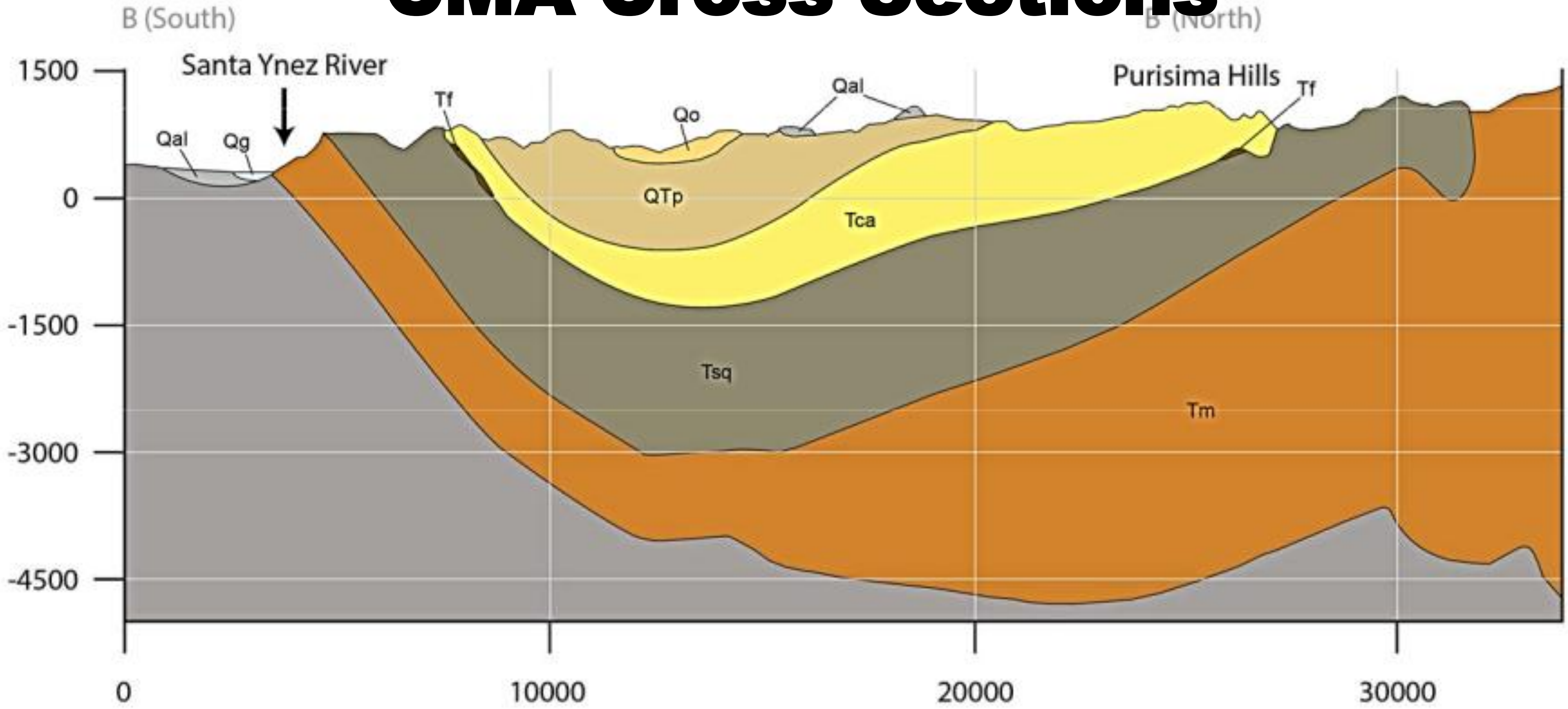
- Surface Geology, Geologic Units (three unconformities)
- Geologic History, Geologic Structure (Folds Synclines / Anticlines and Faults)
- Subsurface Geology (3D Geologic Model and Cross Sections)

**Material previously presented at past GSA Meetings**

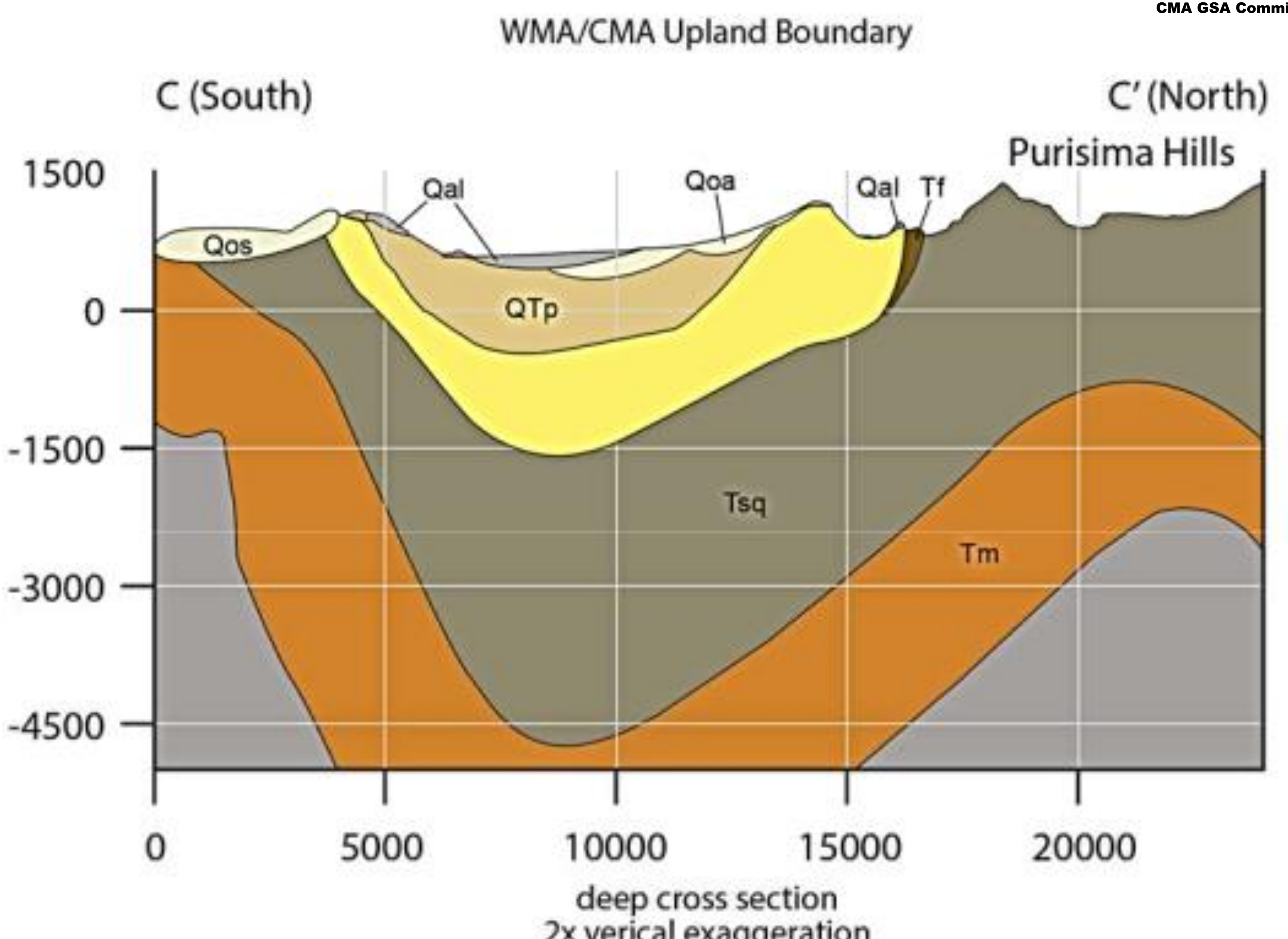
# Surface Geology



# CMA Cross Sections




deep cross section
2x verical exaggeration


WMA/CMA Upland Boundary
C (South)
C' (North)
Purisima Hills
1500
0
-1500
-3000
-4500
Qos
Qal
Qoa
Qal
Tf
QTp
Tsq
Tm
0
5000
10000
15000
20000
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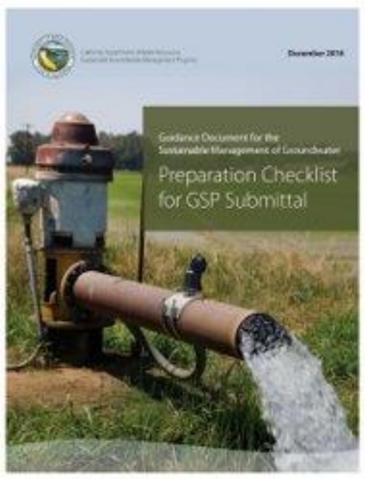
# *HCM Section 2:*

## *CMA and Adjacent Geology*

# DWR Checklist Requirements for HCM

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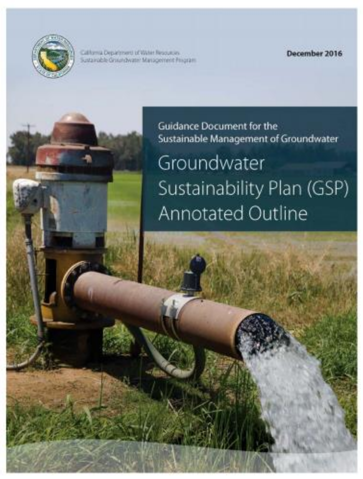


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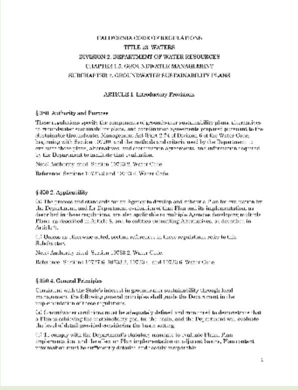

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ARTICLE 1. Introductory Provisions

# HCM Section 2:
## *CMA and Adjacent Geology*

*Questions?*

# HCM Section 3:
## *Principal Aquifers and Aquitards*

*Section 3* provides a discussion of geologic units corresponding to aquifers. The physical characteristics of the aquifers in each subarea are summarized.

**Highlights:**

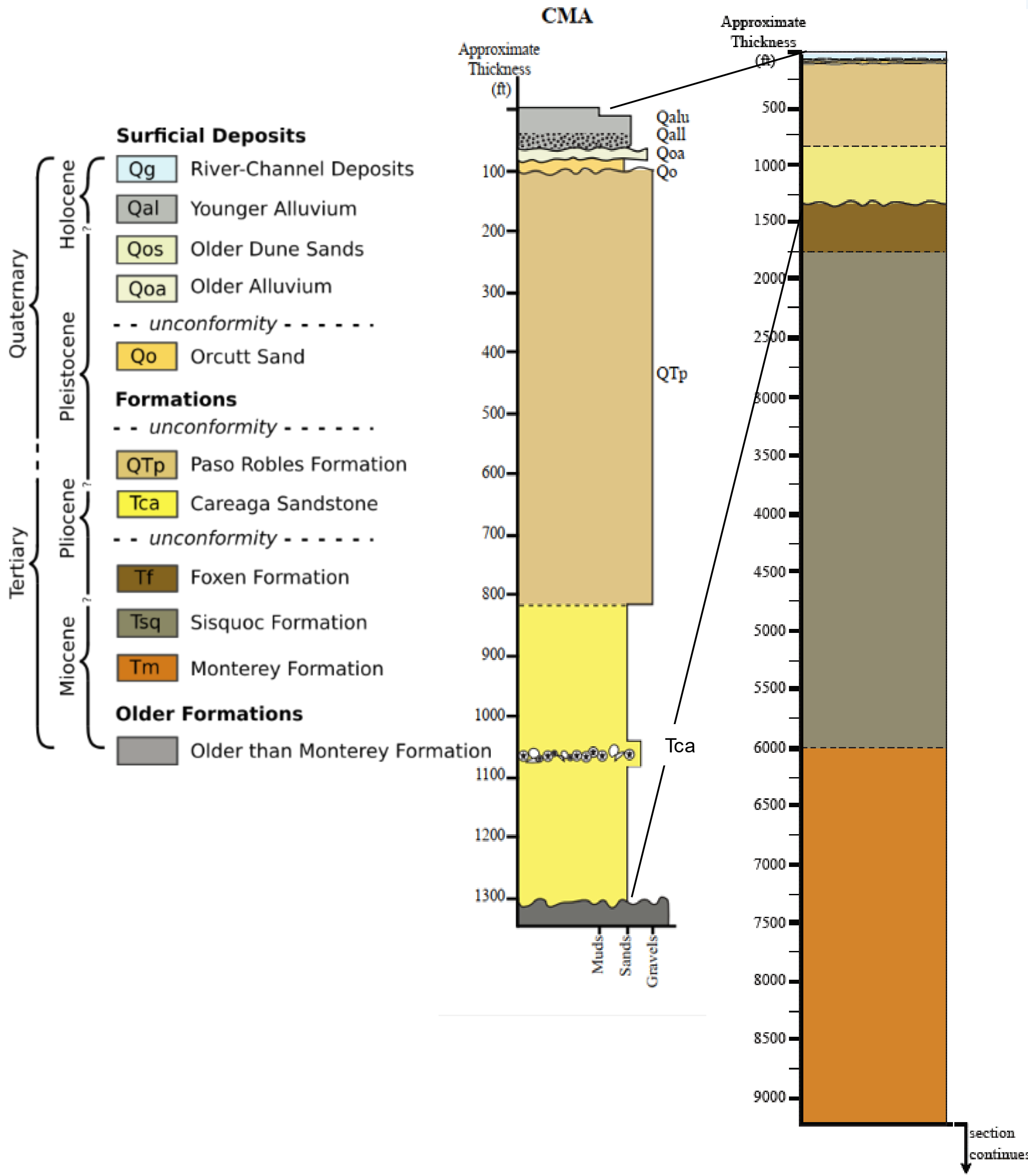
- Aquifer Formations
- Aquifer Base, Aquifer Lateral Extents

**Material partially presented at past GSA Meetings**

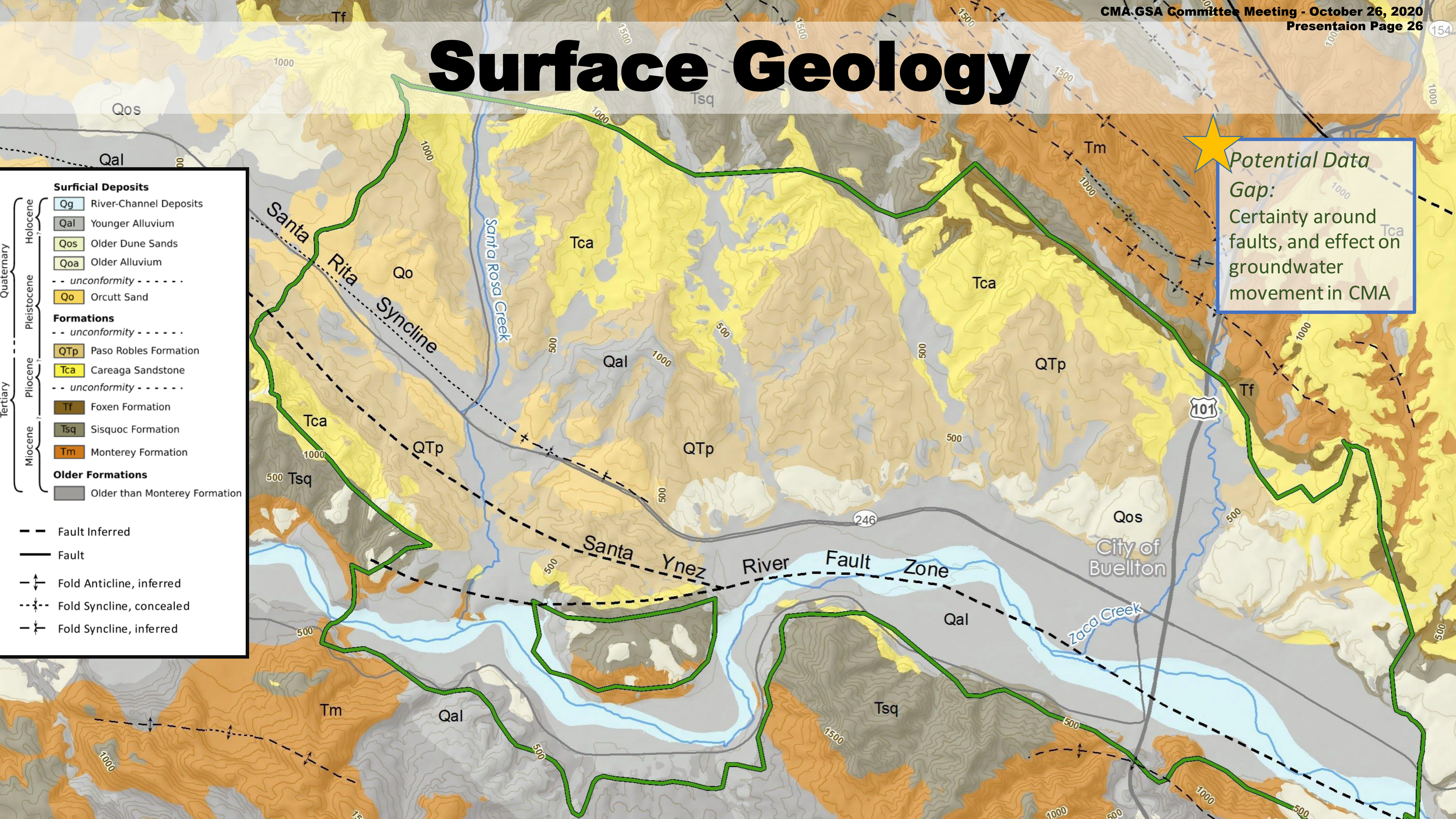
# Stratigraphic Columns

***Geologic units can be categorized into two broad categories:***

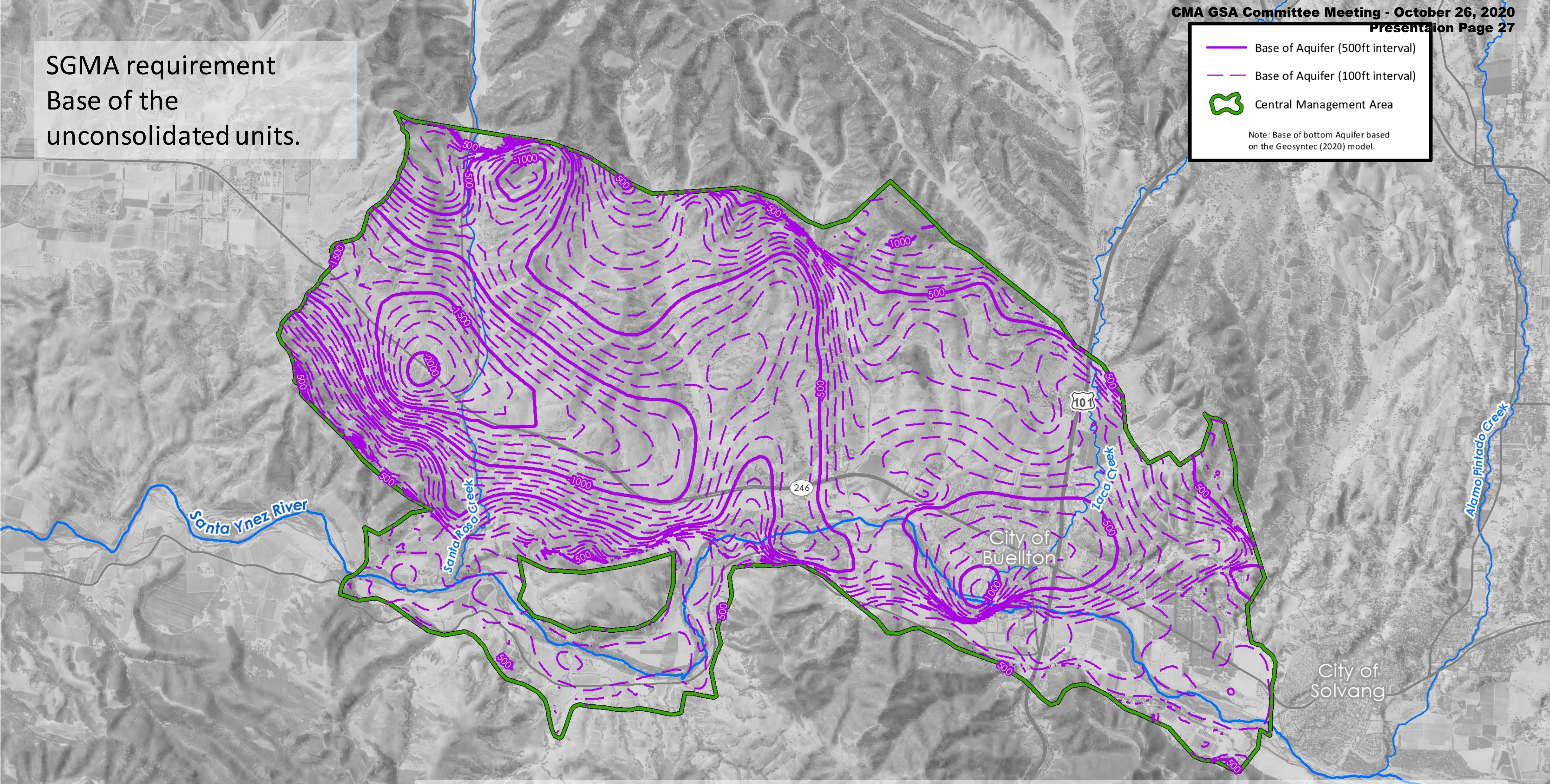
1. Unconsolidated Deposits, water bearing
   - Upper Aquifer
     - River gravels, Younger alluvium, Older Alluvium
     - Orcutt Sand
   - Lower Aquifer
     - Paso Robles, Careaga Sand
2. Consolidated Rock, not water bearing
   - underlies the ground-water basin and crops out in the surrounding hills, Monterey Shale, Foxen, and Sisquoc Formations
   - In terms of SGMA terminology forms the “definable bottom of the basin” and “lateral basin boundaries”



# Surface Geology

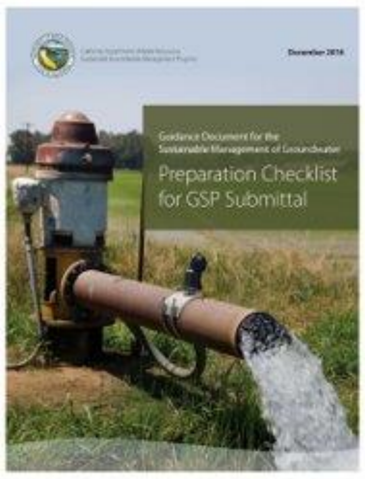


SGMA requirement
Base of the
unconsolidated units.




# Aquifer Base and Extents

# ***HCM Section 3:***
# *Principal Aquifers & Aquitards*

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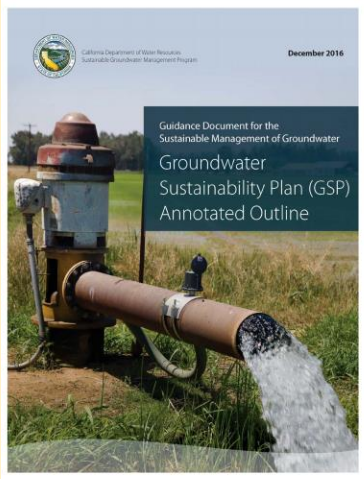


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# SGMA Regulations

## § 354.14. Hydrogeologic Conceptual Model

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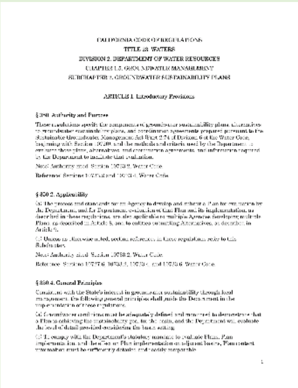
(g) Identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information.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§ 350. Authority and Purpose

§ 350.2. Applicability

§ 350.4. General Principles

# HCM Section 3:
## *Principal Aquifers and Aquitards*

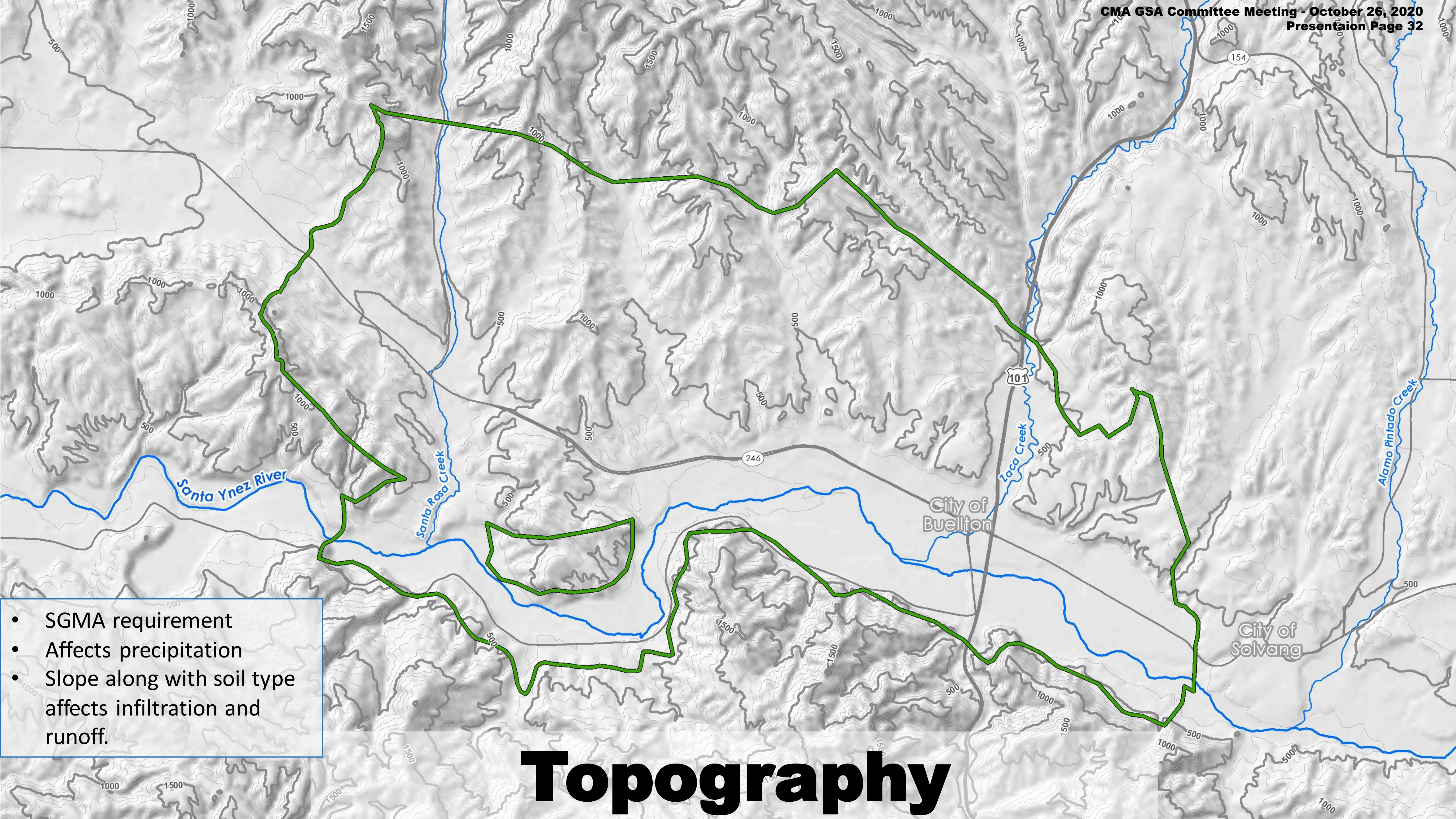
*Questions?*

# HCM Section 4:
*Hydrologic Characteristics*

*Section 4* describes physical surface conditions that interact with the groundwater as potential sources of inflows into the groundwater.

**Highlights:**

- Topography and derived components (Precipitation, Watersheds, and Surface Water)
- Imported Water
- Wastewater
- Soils and Groundwater Recharge Potential



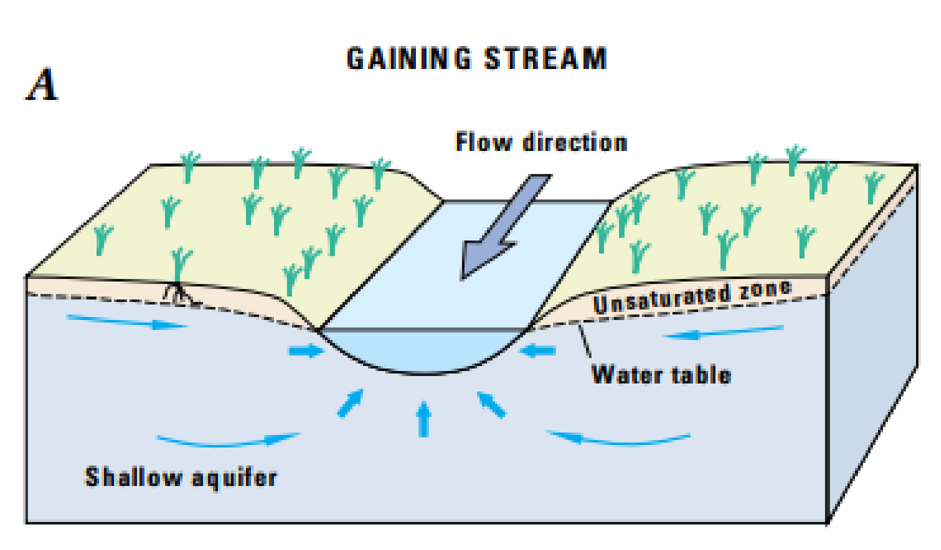

- SGMA requirement
- Affects precipitation
- Slope along with soil type affects infiltration and runoff.

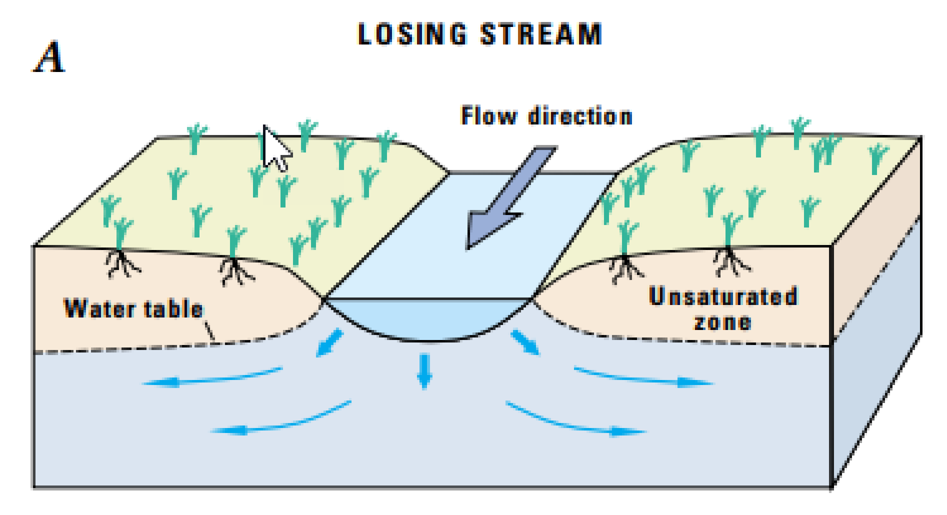
# Topography

# Topography Effects on Groundwater Recharge and Discharge

When groundwater elevation and ground surface elevation intersect, groundwater may be observed as surface water, streams, seeps or springs (a point of discharge).

When groundwater elevation is below ground surface elevation, this is may relate to an area of groundwater recharge or infiltration.

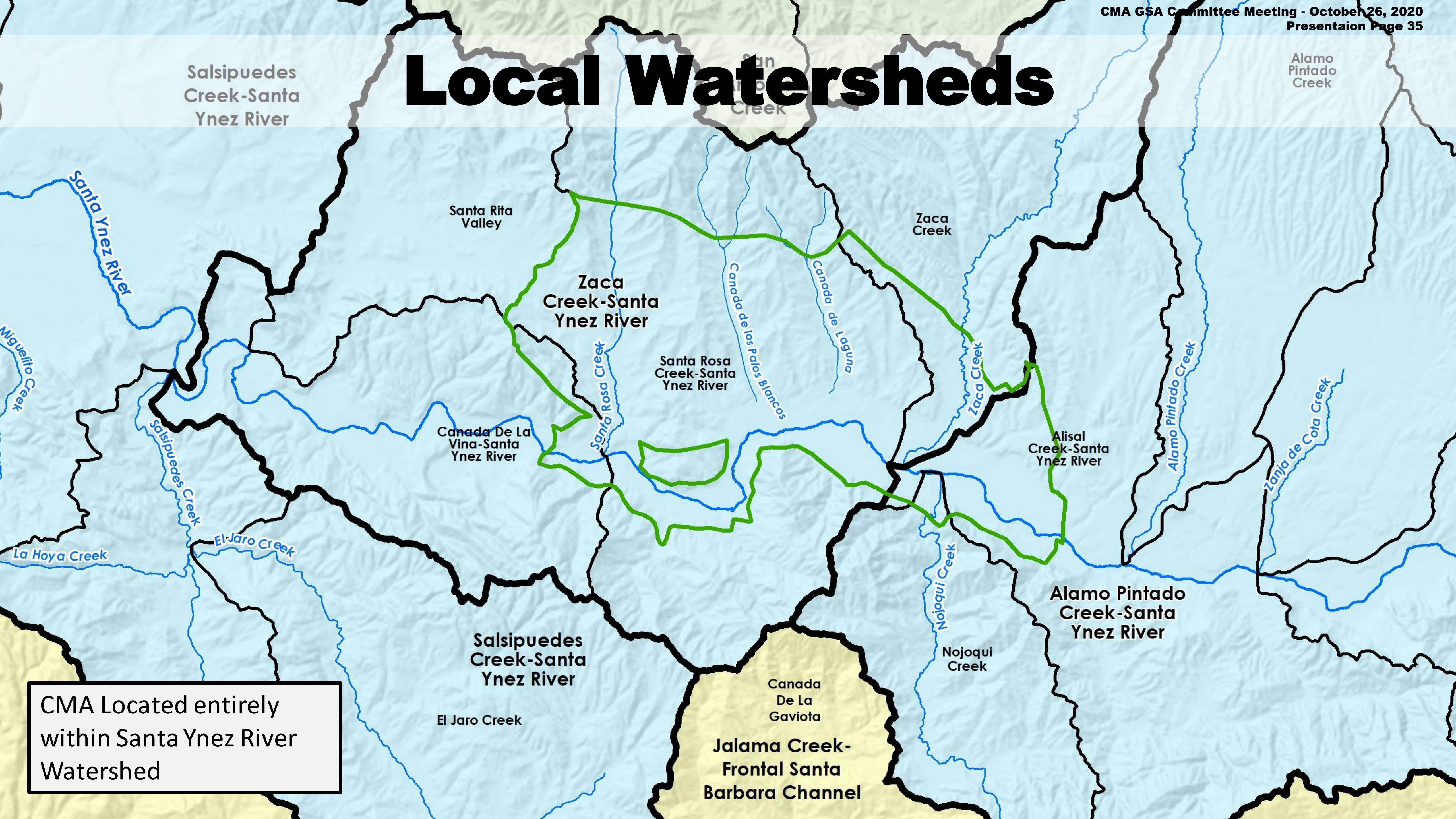


# Surface Water

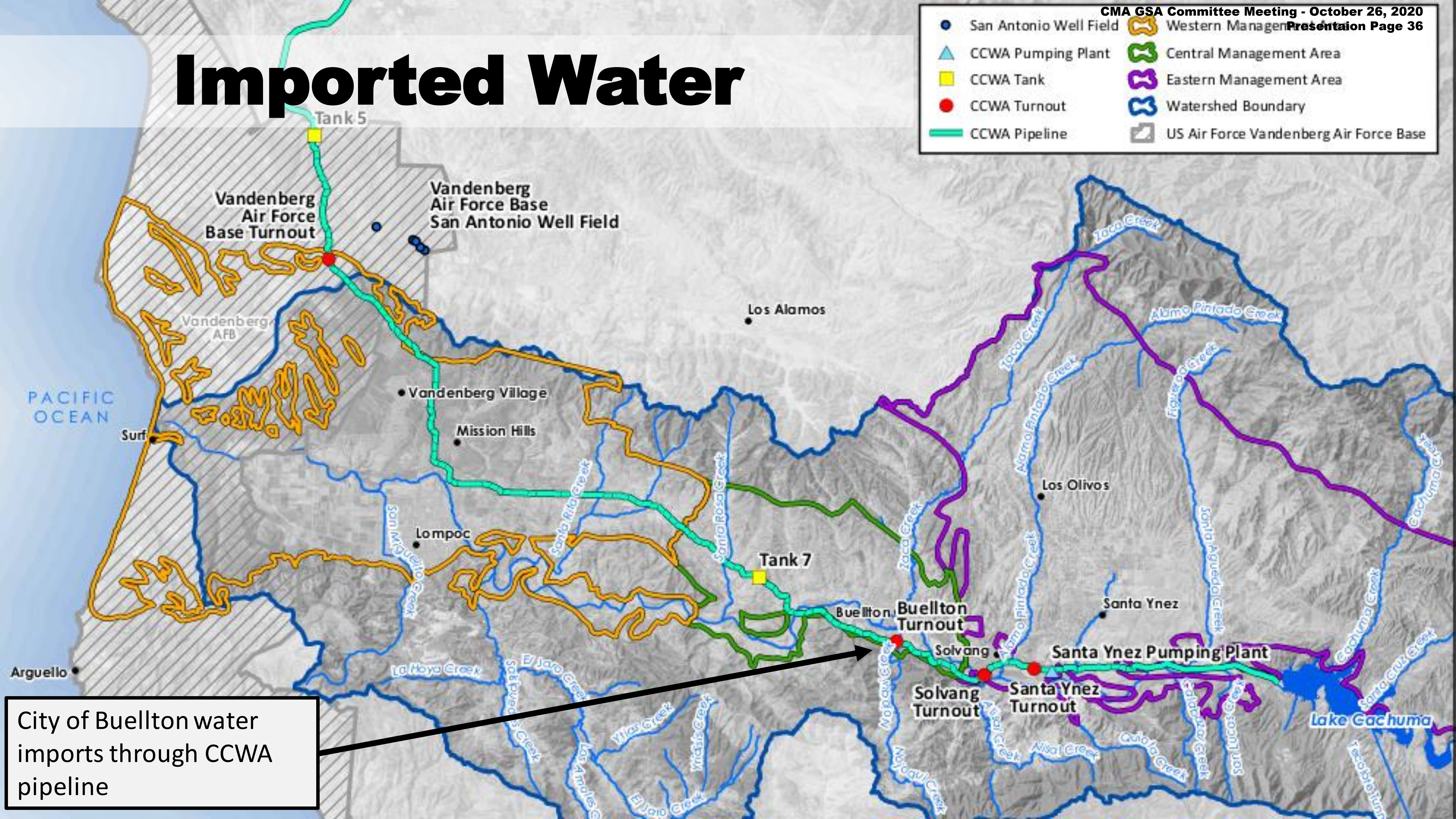

- Surface water at CMA boundary affected by runoff from entire watershed
- Cachuma Project impacts Santa Ynez River, currently (October 2020) releasing for downstream recharge

# Local Watersheds



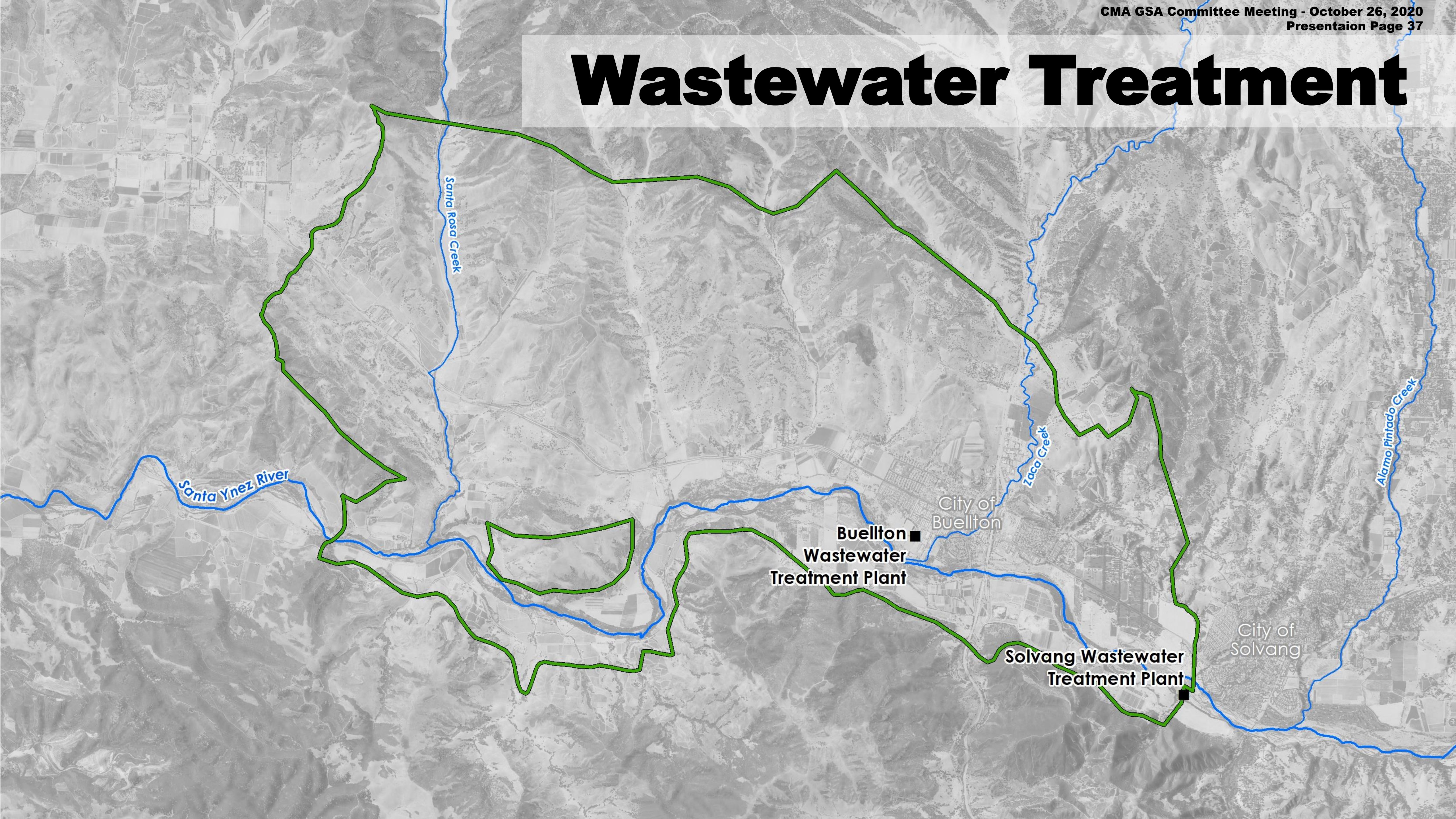

CMA Located entirely within Santa Ynez River Watershed

# Imported Water




City of Buellton water imports through CCWA pipeline

# Wastewater Treatment



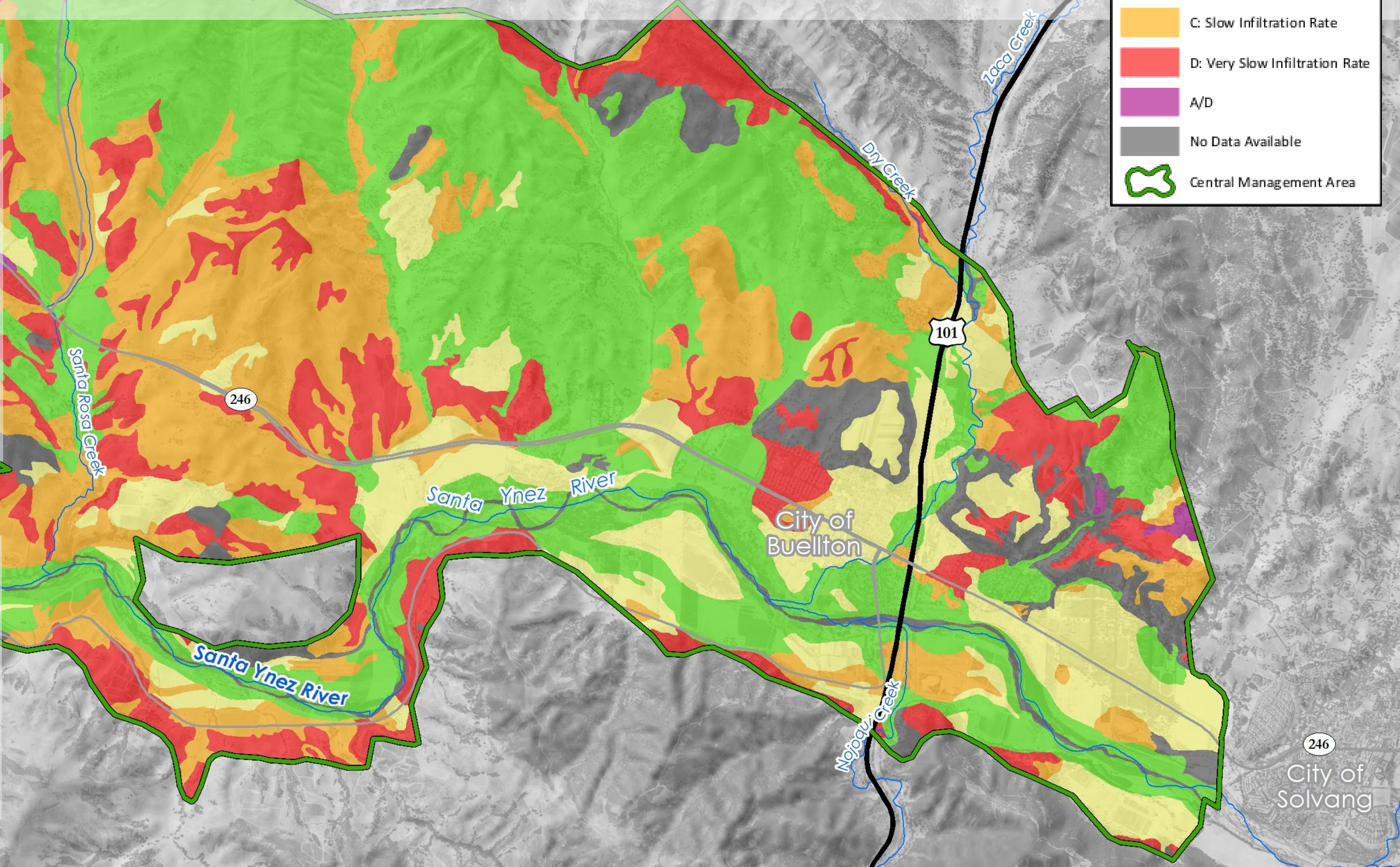
# Soil Infiltration

HCM presents the various soil types within the CMA and how they contribute to groundwater recharge and return flows. This information is quantified in the Water Budget.

**Key Recharge Areas:**

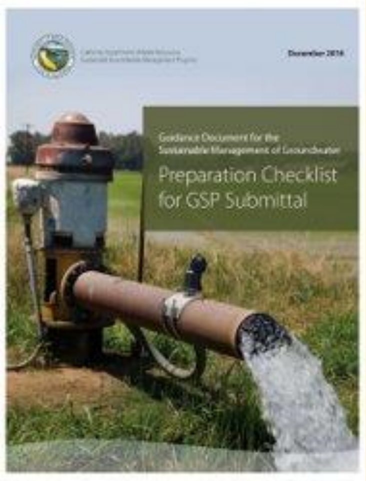
-Mountain Front in Buellton Uplands

-Along Santa Ynez River



# *HCM Section 4:*
## *Hydrologic Characteristics*

# DWR Checklist Requirements for HCM




2.2.1 **Hydrogeologic Conceptual Model** ***(Reg. § 354.14)***

- ✔ **Graphical and narrative description of the physical components of the basin**
- ✔ **[Minimum] two scaled cross-sections**
- Map(s) of physical characteristics
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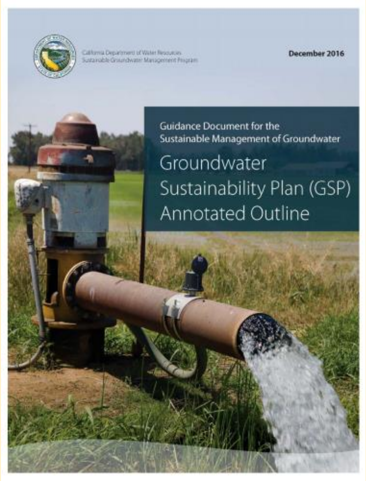


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# SGMA Regulations

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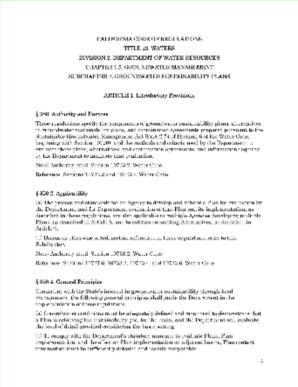
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# HCM Section 4:
## *Hydrologic Characteristics*

*Questions?*

# HCM Section 5:
# *Groundwater Uses and Users in the CMA*

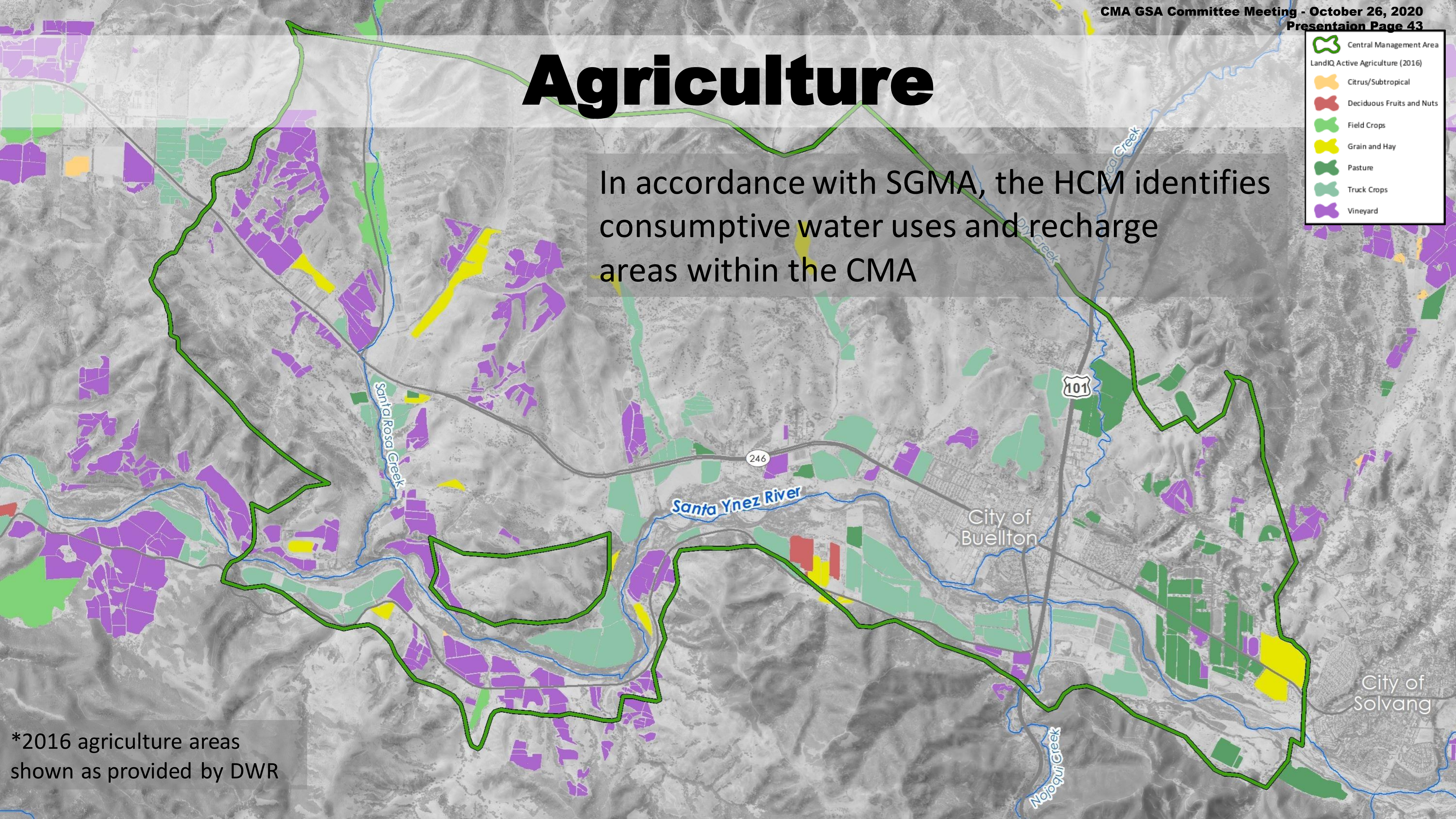
*Section 5* discusses the various uses and users of the groundwater within the WMA.

**Highlights:**

- Agriculture
  - Farmers, Ranchers, Vintners
- Municipal & Industrial
  - City of Buellton, MWCs, Mining
- Environmental
  - Groundwater Dependent Ecosystems
    - Phreatophytes, animals and people
  - Surface water, Springs and Seeps

# Agriculture

In accordance with SGMA, the HCM identifies consumptive water uses and recharge areas within the CMA



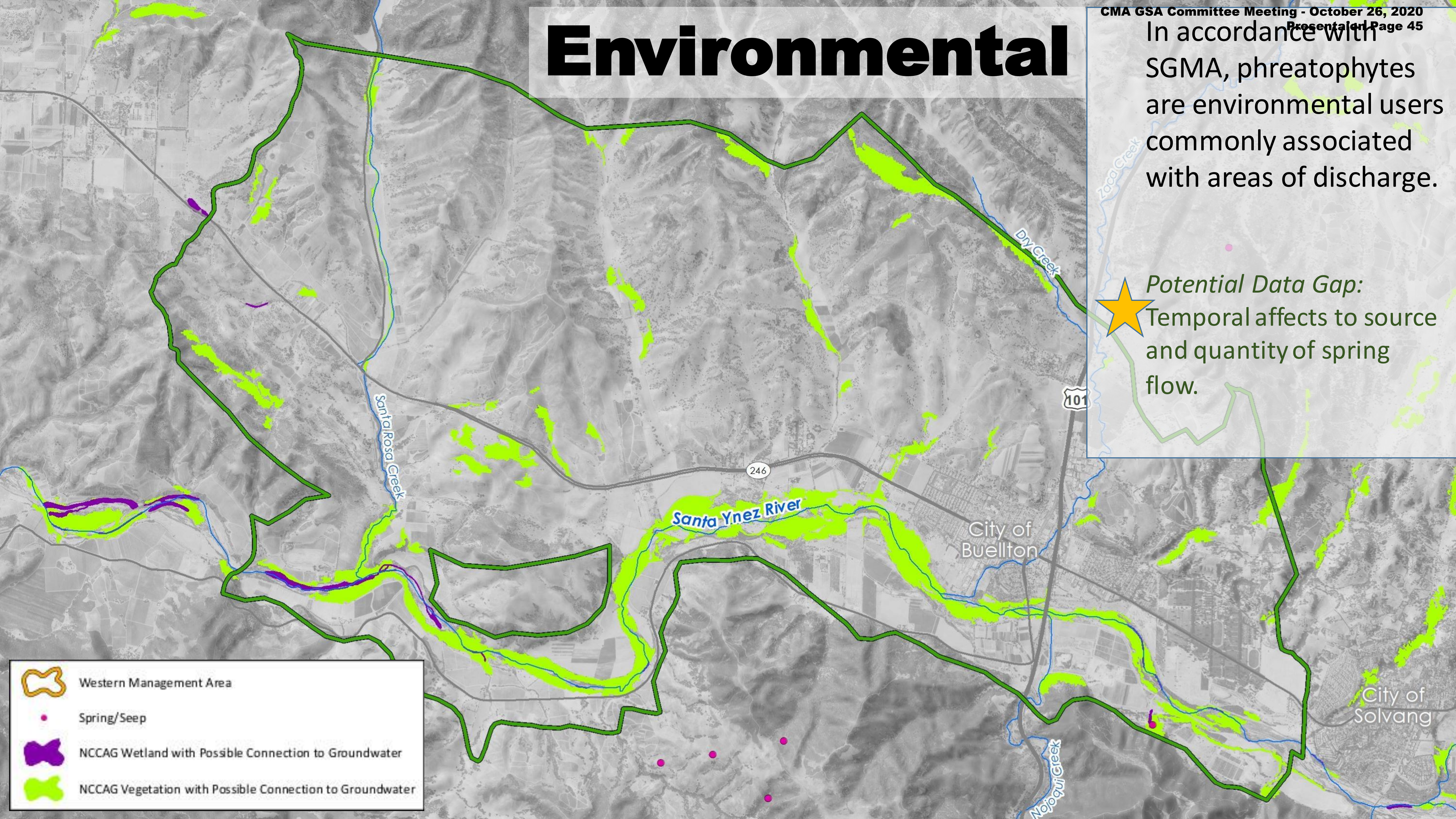

*2016 agriculture areas shown as provided by DWR

# Municipal & Industrial

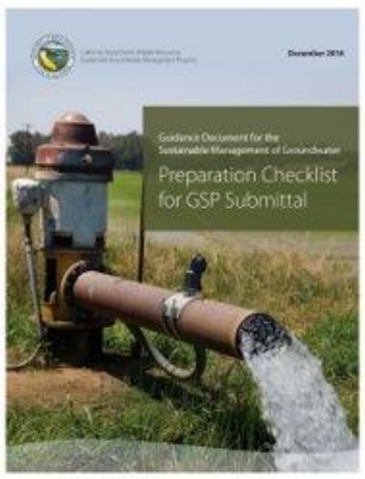
# Environmental

In accordance with SGMA, phreatophytes are environmental users commonly associated with areas of discharge.

*Potential Data Gap:*
Temporal affects to source and quantity of spring flow.



# HCM Section 5:
## *Uses of Groundwater in the CMA*

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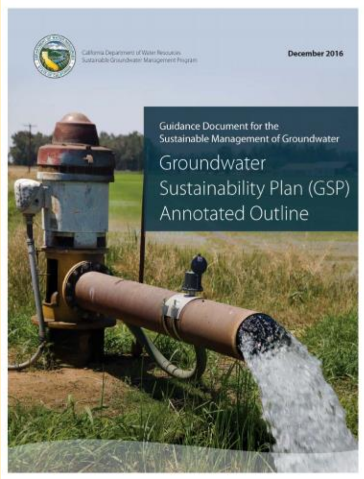


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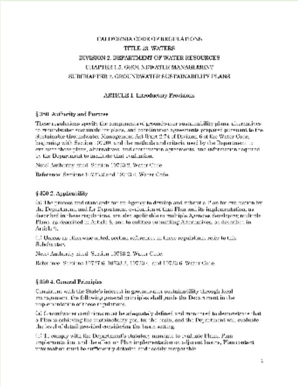

# HCM Section 5:
## *Uses of Groundwater in the CMA*

*Questions?*

# HCM Section 6:
## *Data Gaps and Uncertainty*

*Section 6* addresses the data gaps at the time that this memorandum was written and uncertainty with respect to certain components of the HCM.

**Highlights:**

- Influence of faults on groundwater movement
- Temporal affects to identified springs in the CMA

# HCM Section 6:
*Data Gaps and Uncertainty*

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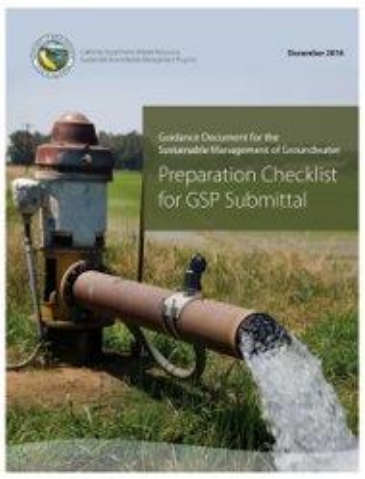


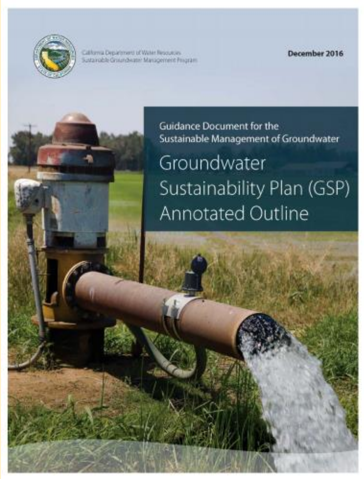


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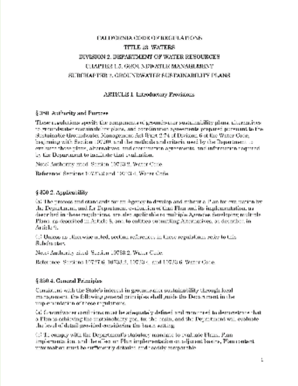
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# HCM Section 6:

## *Data Gaps and Uncertainty*

*Questions?*

# Upcoming Meetings & Opportunities for Engagement

***Regularly scheduled GSA Meeting / Workshop in November***

- Groundwater Conditions Technical Memo
- Groundwater Modeling status update
- Introduce Sustainable Management Criteria

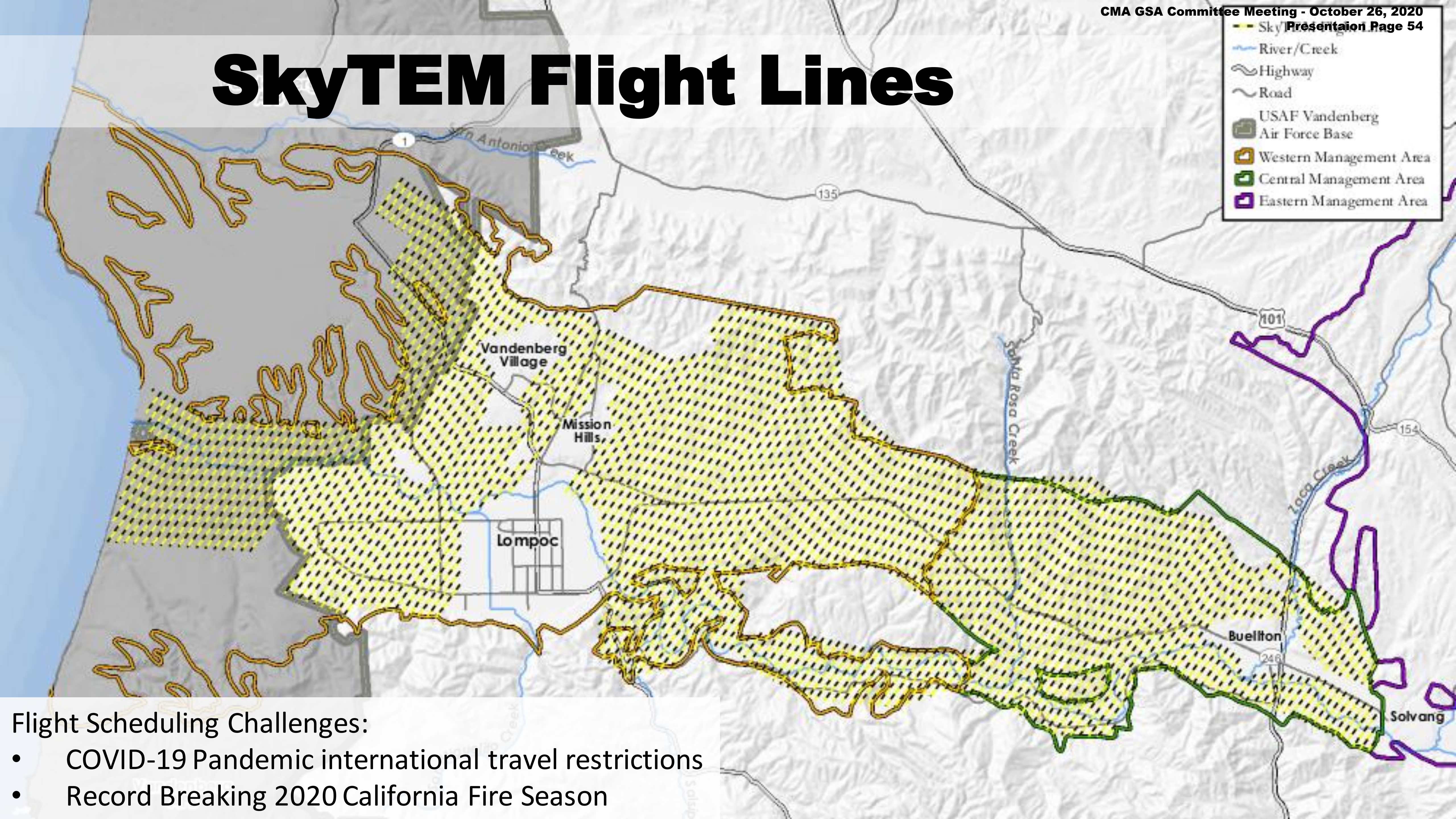
***GSA Special Meeting / Workshop in December***

- Water Budget Technical Memo
- Groundwater modeling construction, calibration and simulations
- Sustainable Management Criteria

***GSA Meeting / Workshop in January***

- Sustainable Management Criteria
- Monitoring Network

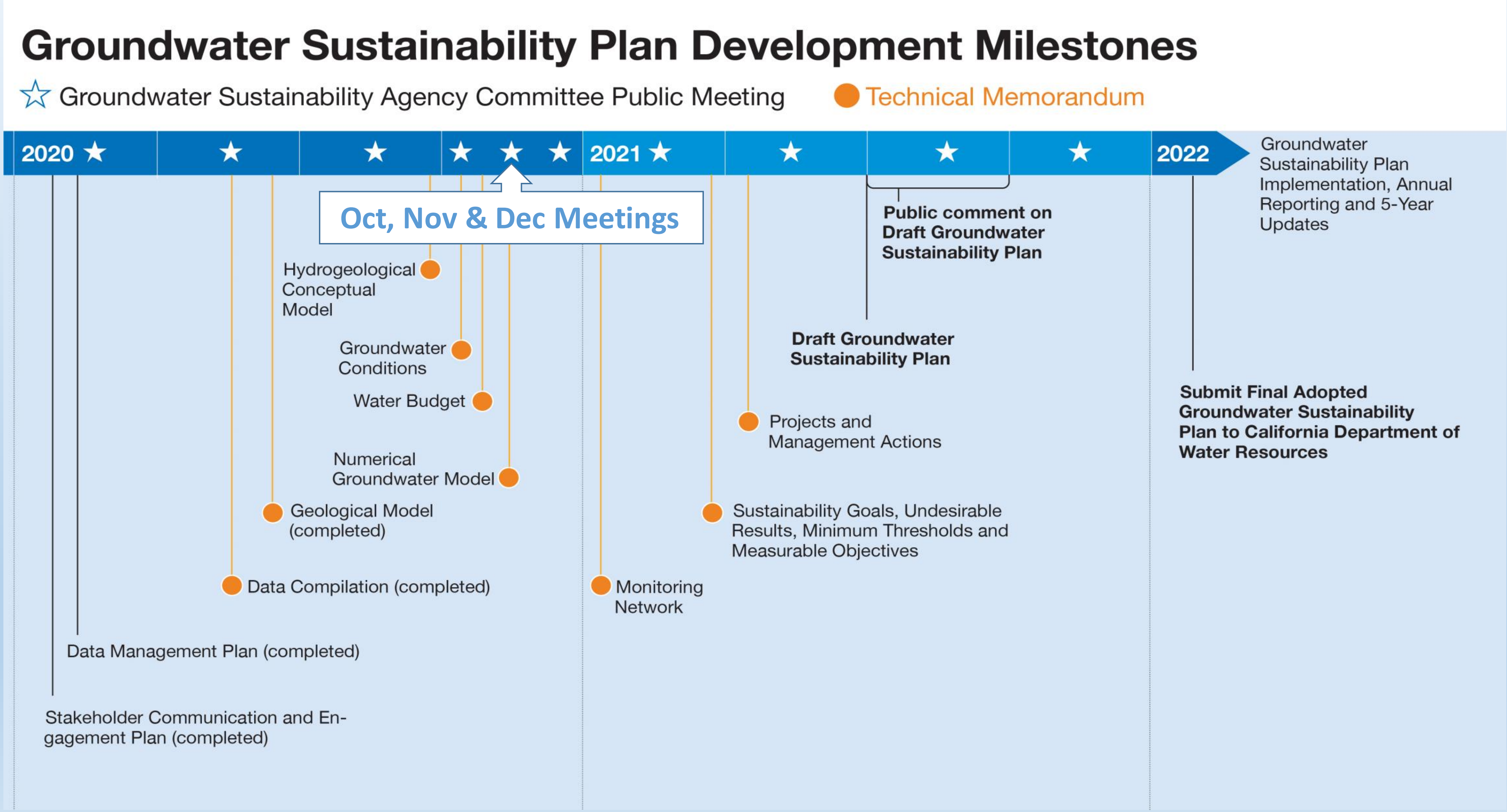
# SkyTEM Flight Lines




Flight Scheduling Challenges:

- COVID-19 Pandemic international travel restrictions
- Record Breaking 2020 California Fire Season

# The Way Ahead



CMA

Santa Ynez River Valley Groundwater Basin
Central Management Area
Groundwater Sustainability Agency

# Questions?

Outreach & Engagement Website
https://www.santaynezwater.org/