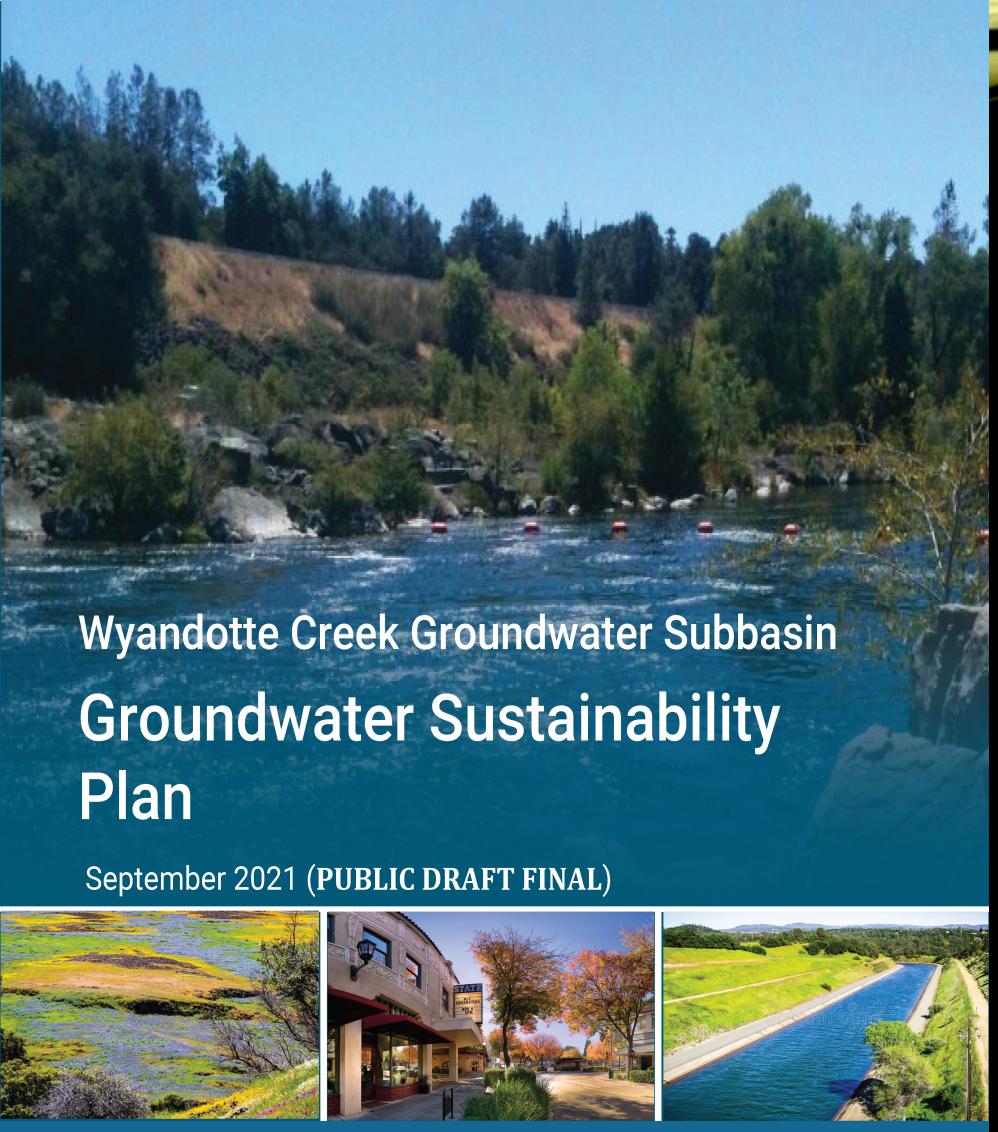
WYANDOTTE CREEK SUBBASIN GROUNDWATER SUSTAINABILITY PLAN PUBLIC WORKSHOP OCTOBER 20, 2021

Wyandotte Creek
GROUNDWATER SUSTAINABILITY AGENCY



Wyandotte Creek GROUNDWATER SUSTAINABILITY AGENCY

PREPARED FOR

WYANDOTTE CREEK GROUNDWATER SUSTAINABILITY AGENCY

- Executive Summary
- Chapter 1 - Agency Information, Plan Area, Communication
- Chapter 2 - Basin Setting
- Chapter 3 - Sustainable Management Criteria
- Chapter 4 - Monitoring Networks
- Chapter 5 - Project and Management Actions
- Chapter 6 - Plan Implementation

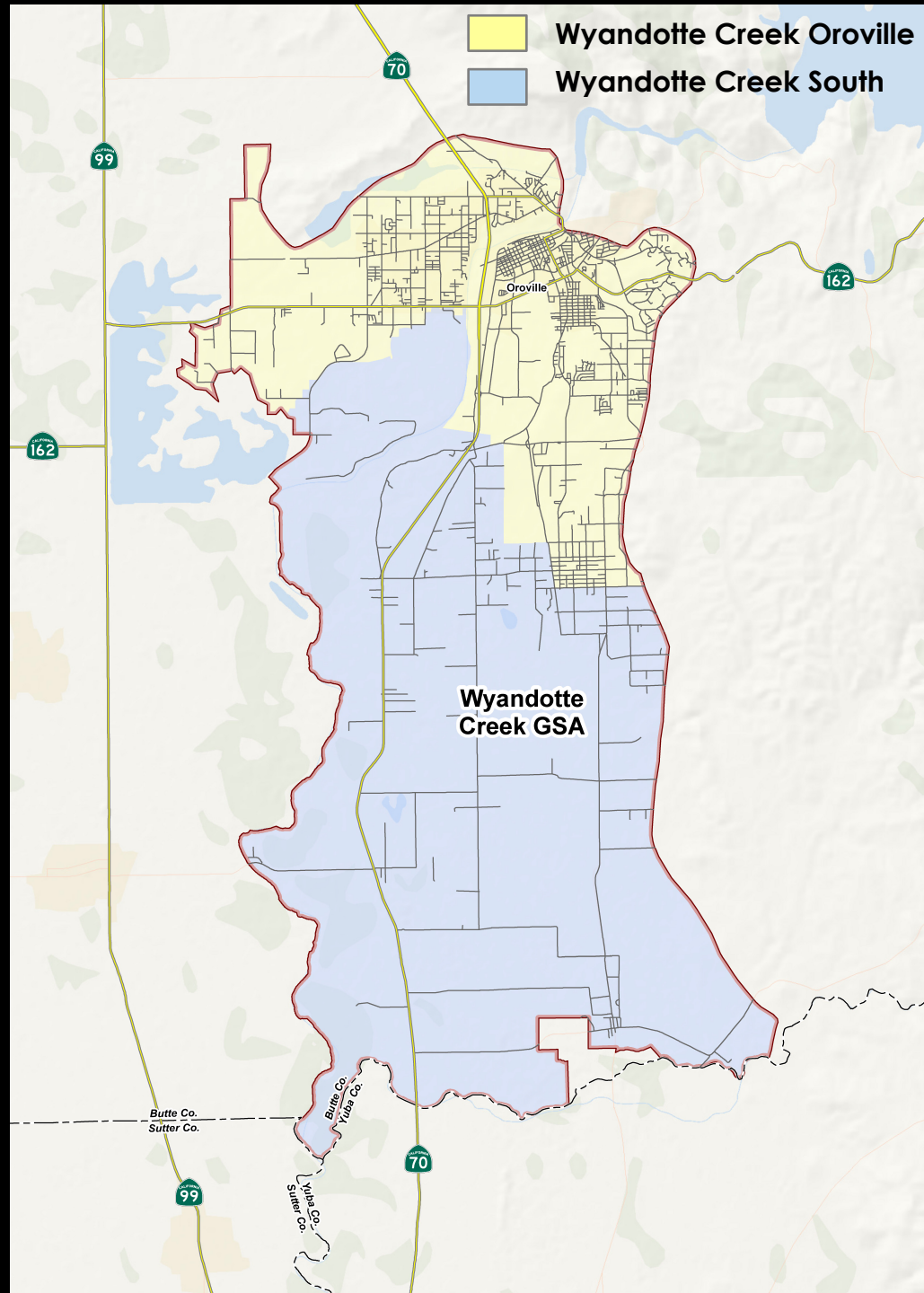
GSP Outline
Public Draft Final

CHAPTER 1
PLAN AREA

Plan Area

- One Groundwater Sustainability Agency
  - Wyandotte Creek GSA

- Two Management Areas
  - Wyandotte Creek Oroville
  - Wyandotte Creek South



What We Know

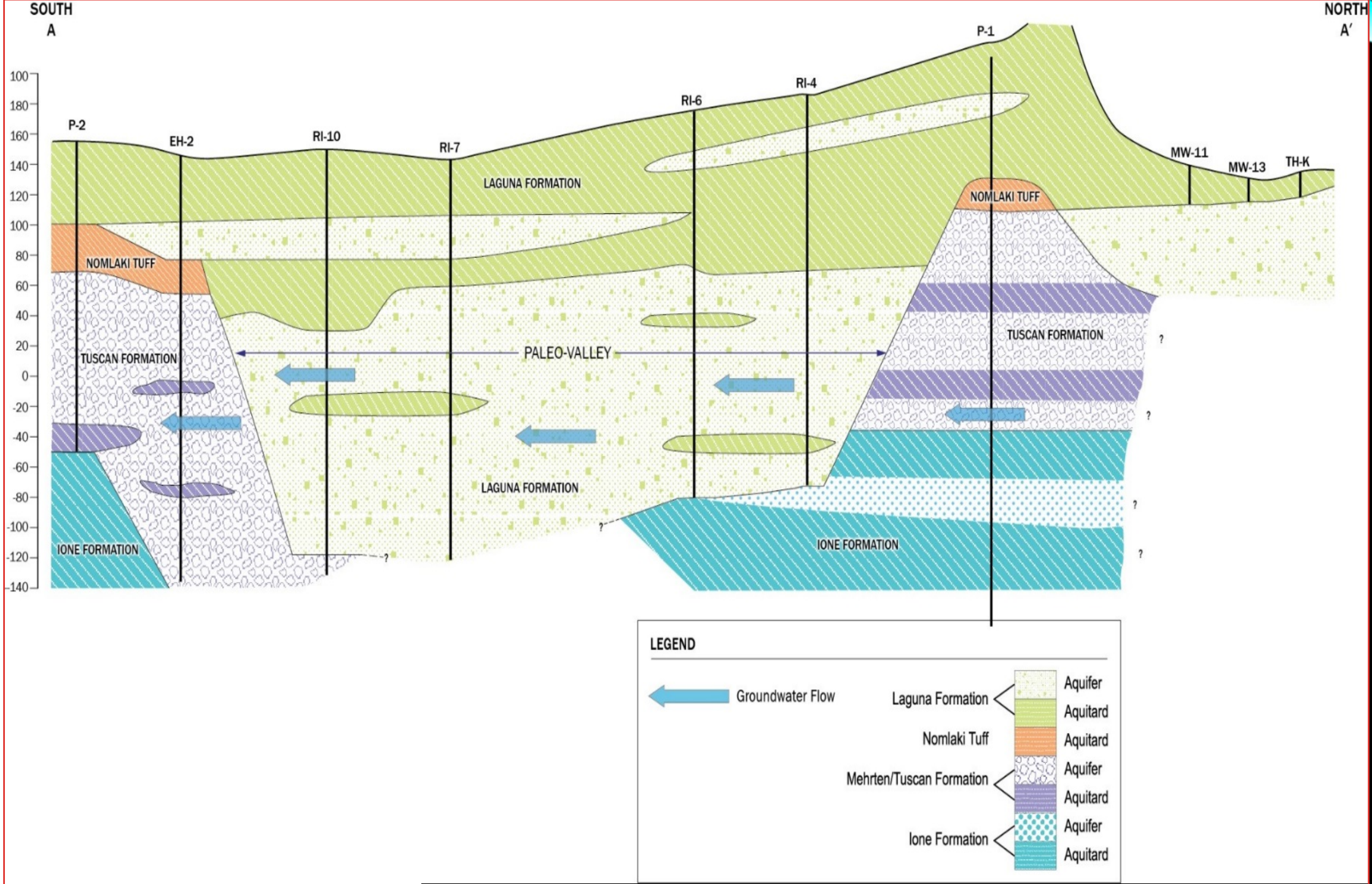
CHAPTER 2
BASIN SETTING

CHAPTER 2 – BASIN SETTING HYDROGEOLOGIC CONCEPTUAL MODEL (HCM)

- What Will You Find
  - ❖Basin Boundaries
  - ❖Topography, Surface Water, and Recharge
  - ❖Regional Geologic and Structural Setting
  - ❖Geologic Formations
  - ❖Groundwater Producing Formations
  - ❖Cross Sections
  - ❖Key Geologic Features
  - ❖Principal Aquifers and Aquitards
  - ❖HCM Data Gaps

PRINCIPAL AQUIFERS AND AQUITARDS

- Single Principal Aquifer
  - Composed of Several Geologic Units
  - Large Paleo Valleys – Former Channels of Feather River
  - Various Aquifer Zones
  - Leaky Aquifer System with Varied Hydraulic Connections
  - Varies From North to South


SOUTH
A
NORTH
A'
P-2
EH-2
RI-10
RI-7
RI-6
RI-4
P-1
MW-11
MW-13
TH-K
LAGUNA FORMATION
NOMLAKI TUFF
TUSCAN FORMATION
PALEO-VALLEY
LAGUNA FORMATION
IONE FORMATION
NOMLAKI TUFF
TUSCAN FORMATION
IONE FORMATION
100
180
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
-120
-140
LEGEND
Groundwater Flow
Laguna Formation
Aquifer
Aquitard
Nomlaki Tuff
Aquitard
Mehrten/Tuscan Formation
Aquifer
Aquitard
Ione Formation
Aquifer
Aquitard

HCM DATA GAPS

Additional Monitoring to Increase Understanding of Aquifer

Further Assess Groundwater Recharge

- Expand Isotopic Analysis
- General Water Quality Analysis
- Recharge Rate

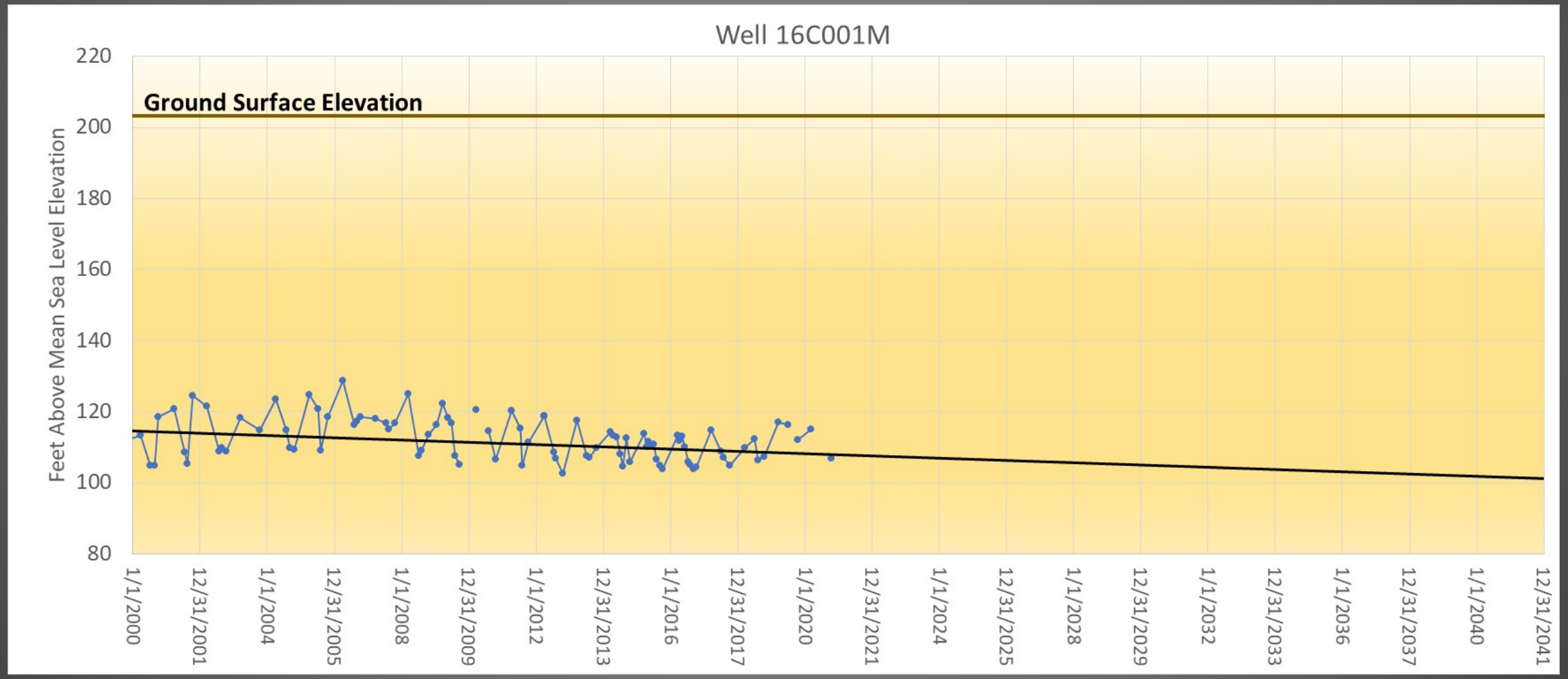
Additional AEM Data Collection

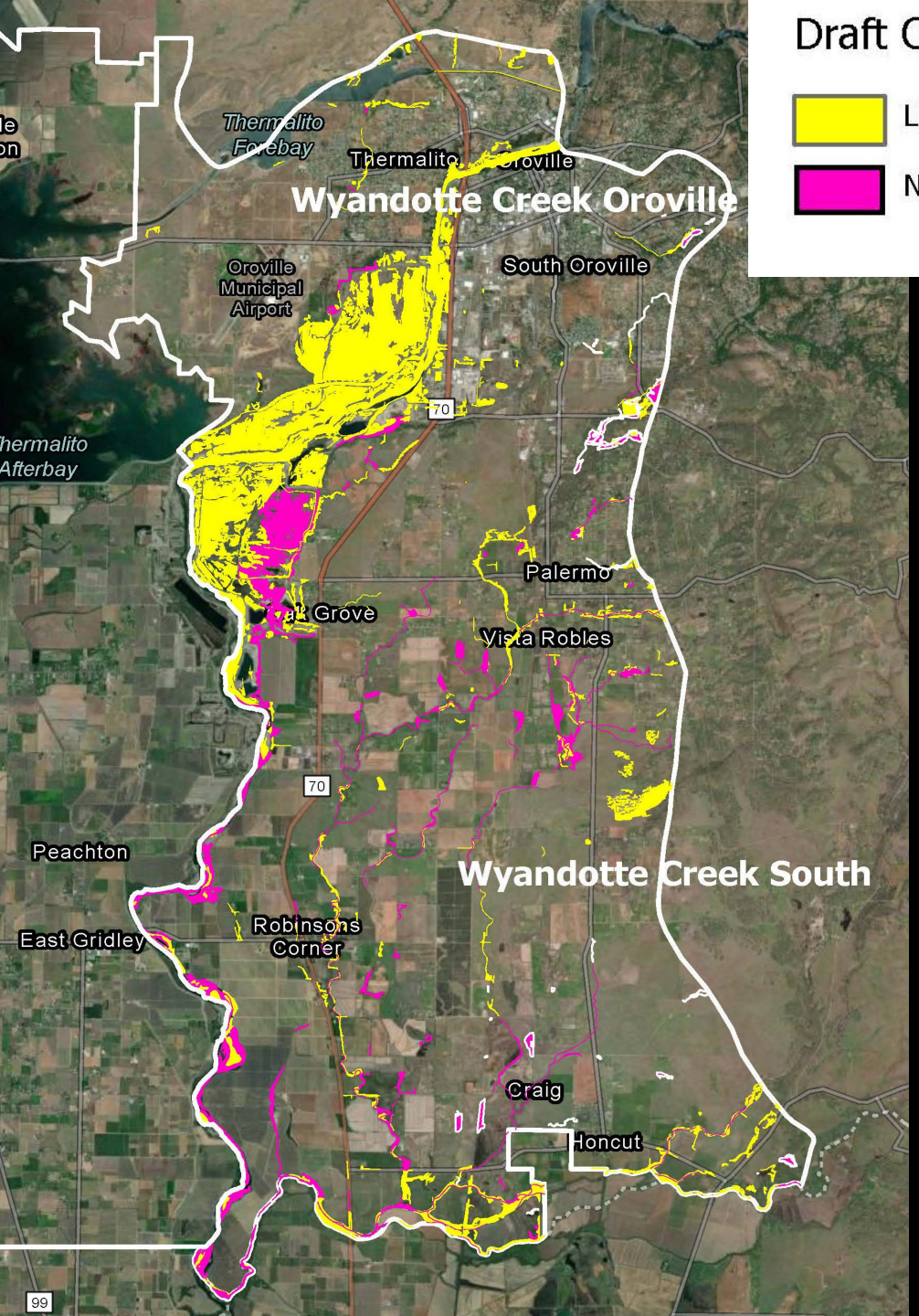
CHAPTER 2 – BASIN SETTING GROUNDWATER CONDITIONS

- What Will You Find
  - Description of Current and Historical Conditions
  - Groundwater Trends
  - Seawater Intrusion
  - Groundwater Quality
  - Land Subsidence
  - Interconnected Surface Water
  - Groundwater Dependent Ecosystems

Groundwater Trends

- Groundwater Flows from the North to South
- Since 2000 many areas have been stable, but some areas have shown some decreases in water level





POTENTIAL GROUNDWATER DEPENDENT ECOSYSTEMS

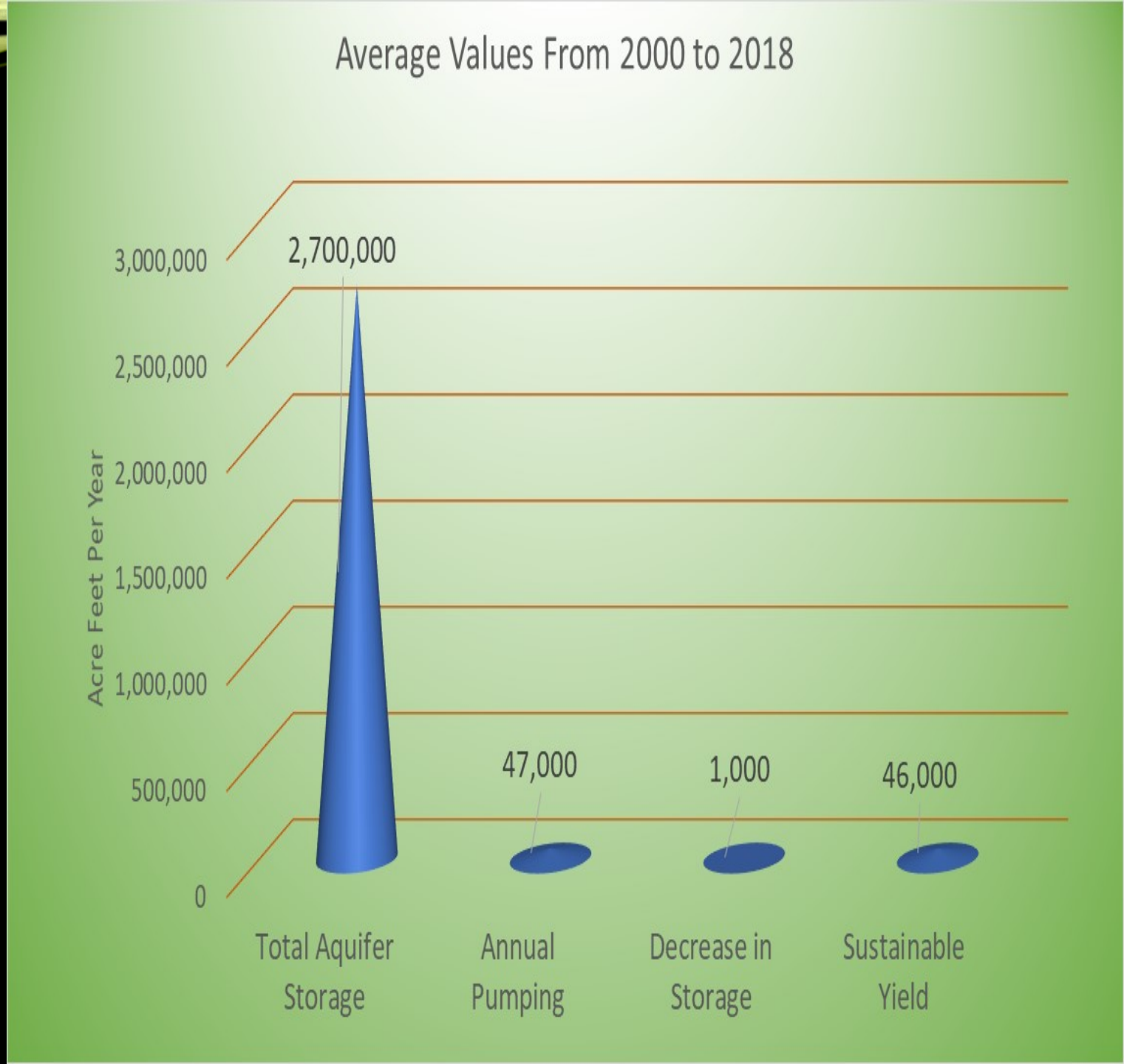
CHAPTER 2 – BASIN SETTING WATER BUDGET

- What Will You Find
  - ❖Selection of Hydrologic Periods
  - ❖Usage of Groundwater Model
  - ❖Water Budget Assumptions
  - ❖Water Budget Estimates
  - ❖Water Budget Uncertainty
  - ❖Overdraft Conditions
  - ❖Sustainable Yield Estimate
  - ❖Recommended Next Steps

DECREASE IN STORAGE AND SUSTAINABLE YIELD

Sustainable Yield

"Maximum quantity of water, calculated over a base period representative of long-term conditions in the basin, and including any temporary surplus that can be withdrawn annually from a groundwater supply without causing an undesirable result."



CLARIFYING QUESTIONS

CHAPTER 3 SUSTAINABLE MANGEMENT CRITERIA

TRACKING CONDITIONS TO MAINTAIN SUSTAINABILITY

SUSTAINABILITY GOAL

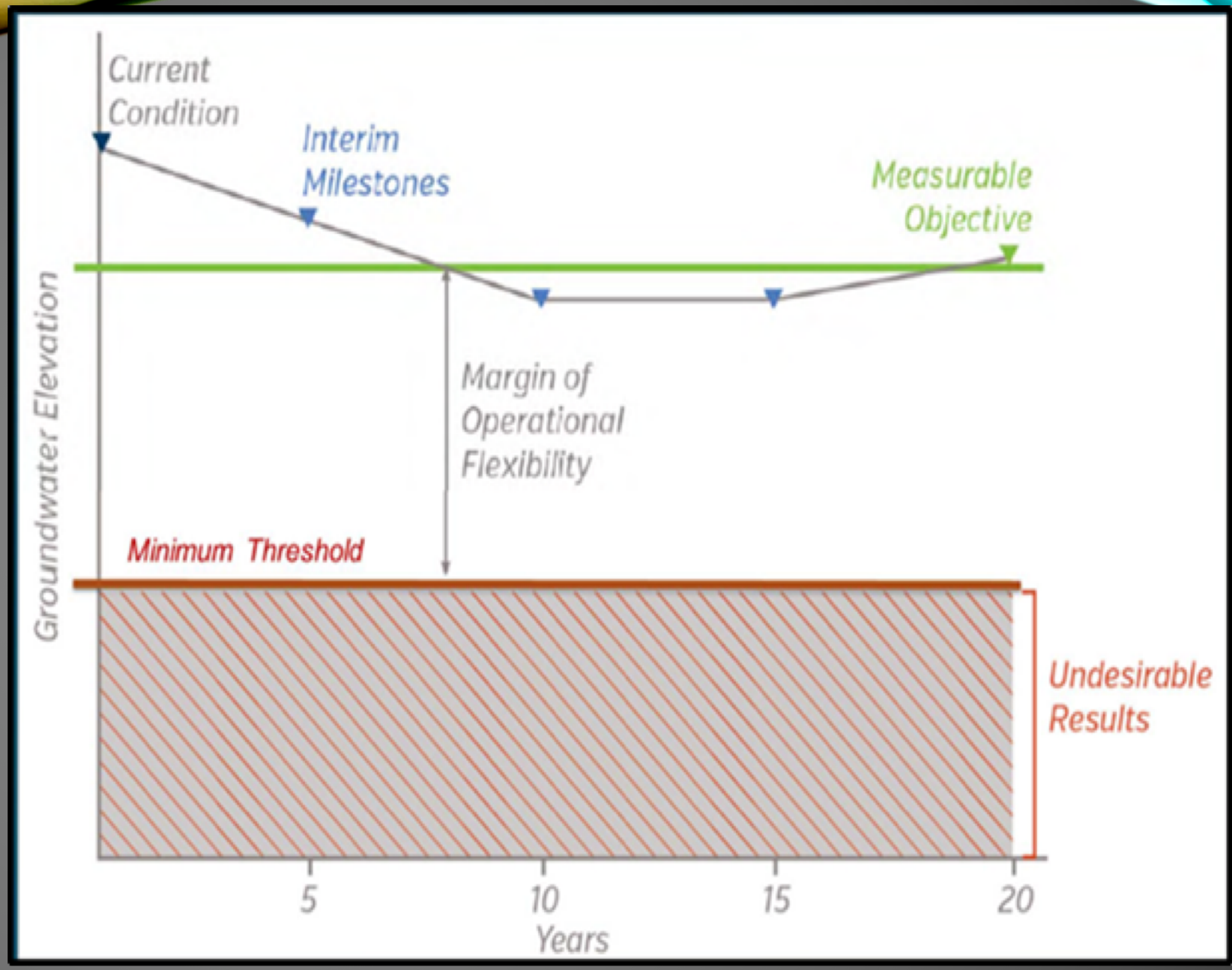
To ensure that groundwater is managed to provide a water supply of adequate quantity and quality to support beneficial users of groundwater including but not limited to rural areas and other communities, the agricultural economic base of the region, and environmental resource uses in the Subbasin now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

SUSTAINABILITY INDICATORS

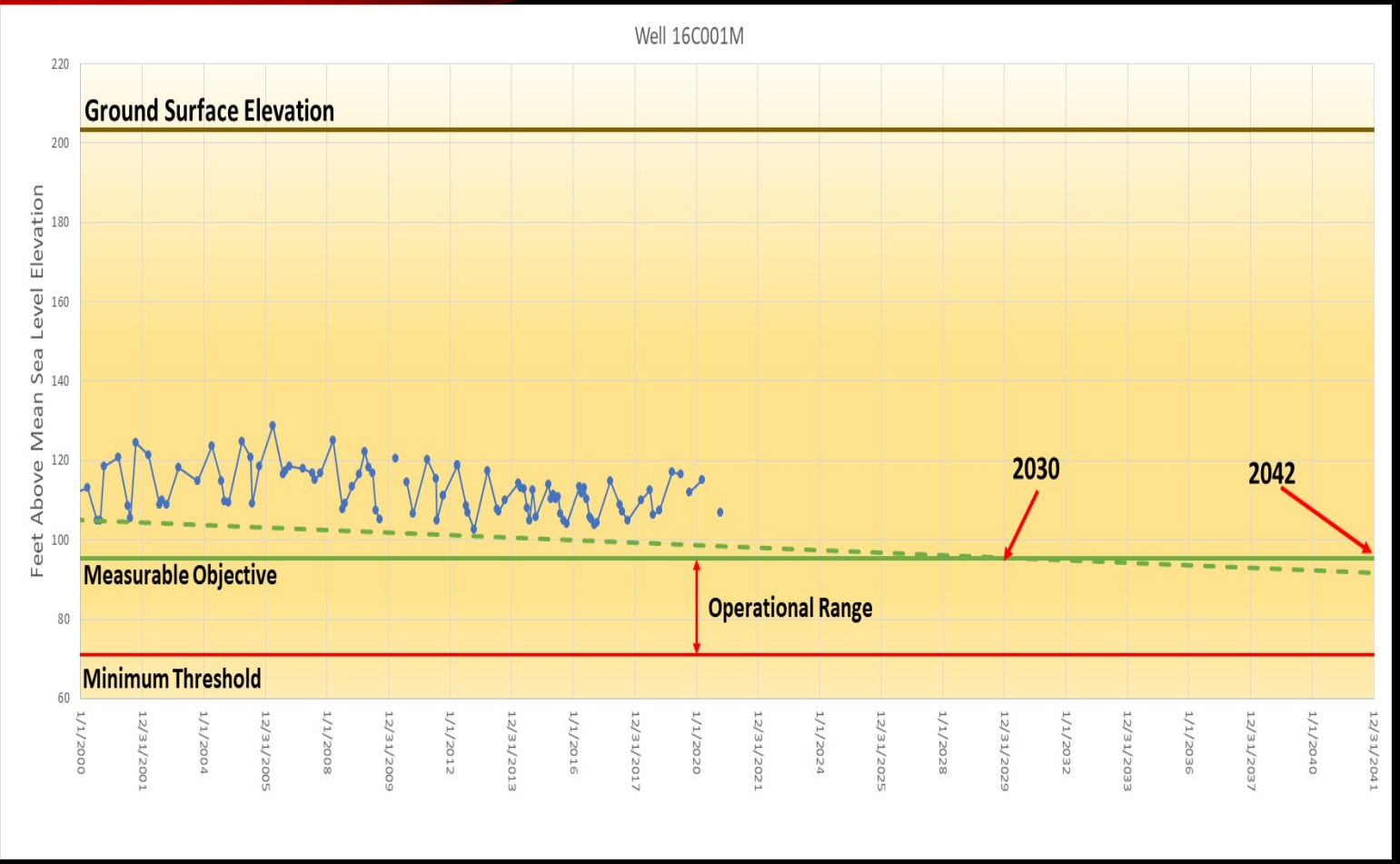
- Used to Characterize Groundwater Conditions Throughout the Subbasin

SUSTAINABLE MANAGEMENT CRITERIA

- Measurable Objective (MO)
  - ✓ Where We Want To Be
- Minimum Threshold (MT)
  - ✓ Point Where Undesirable Results May Start to Occur
- 20 Year Implementation Period



MEASURING SUSTAINABILITY - GROUNDWATER LEVELS

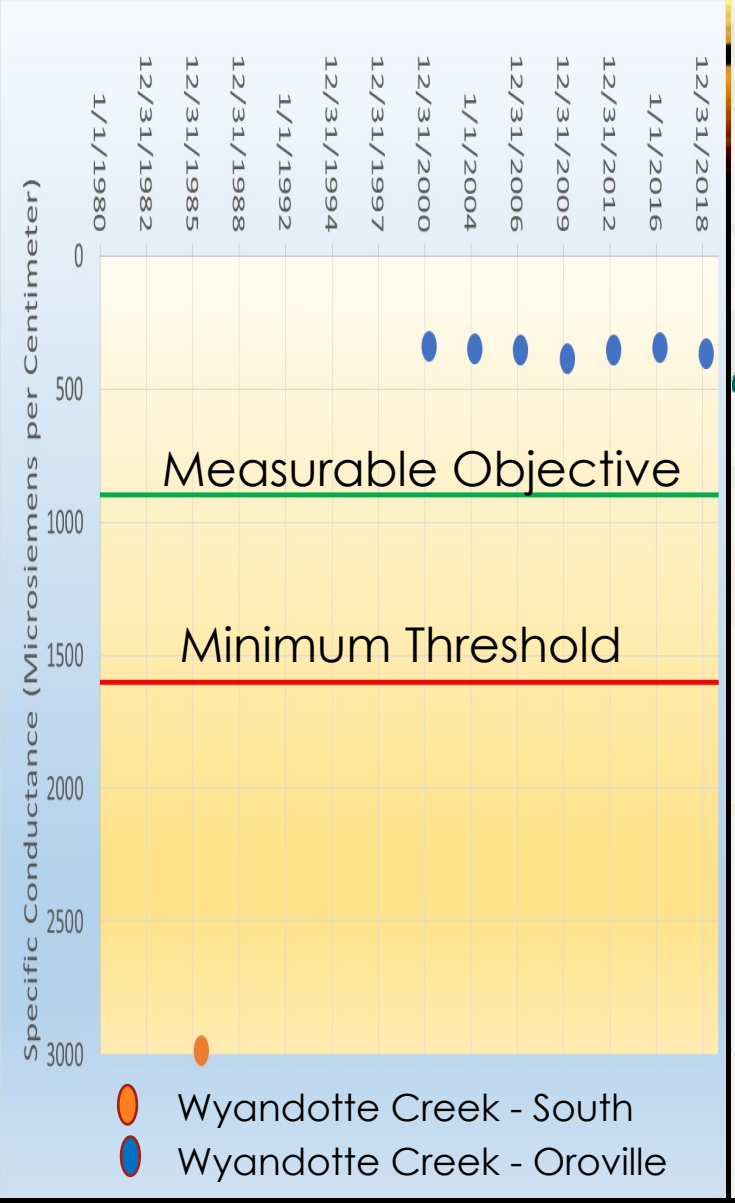


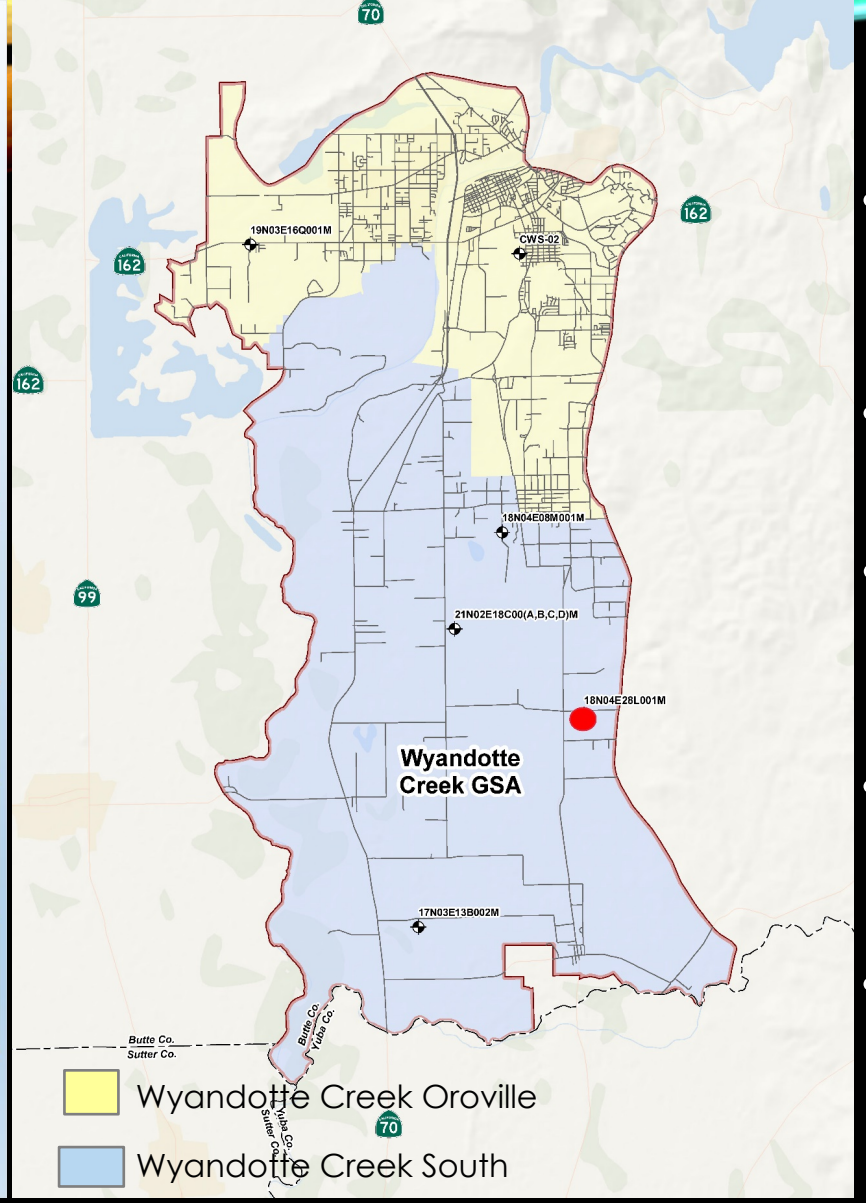
MO - *Groundwater level based on the groundwater trend line for the dry periods (over the period of record) of observed short-term climatic cycles extended to 2030*

MT – *Protective of Sustainably Constructed Domestic Wells.*

- *Installed after 1980*
- *Constructed per County Well Standards*

- *Proxy For:*

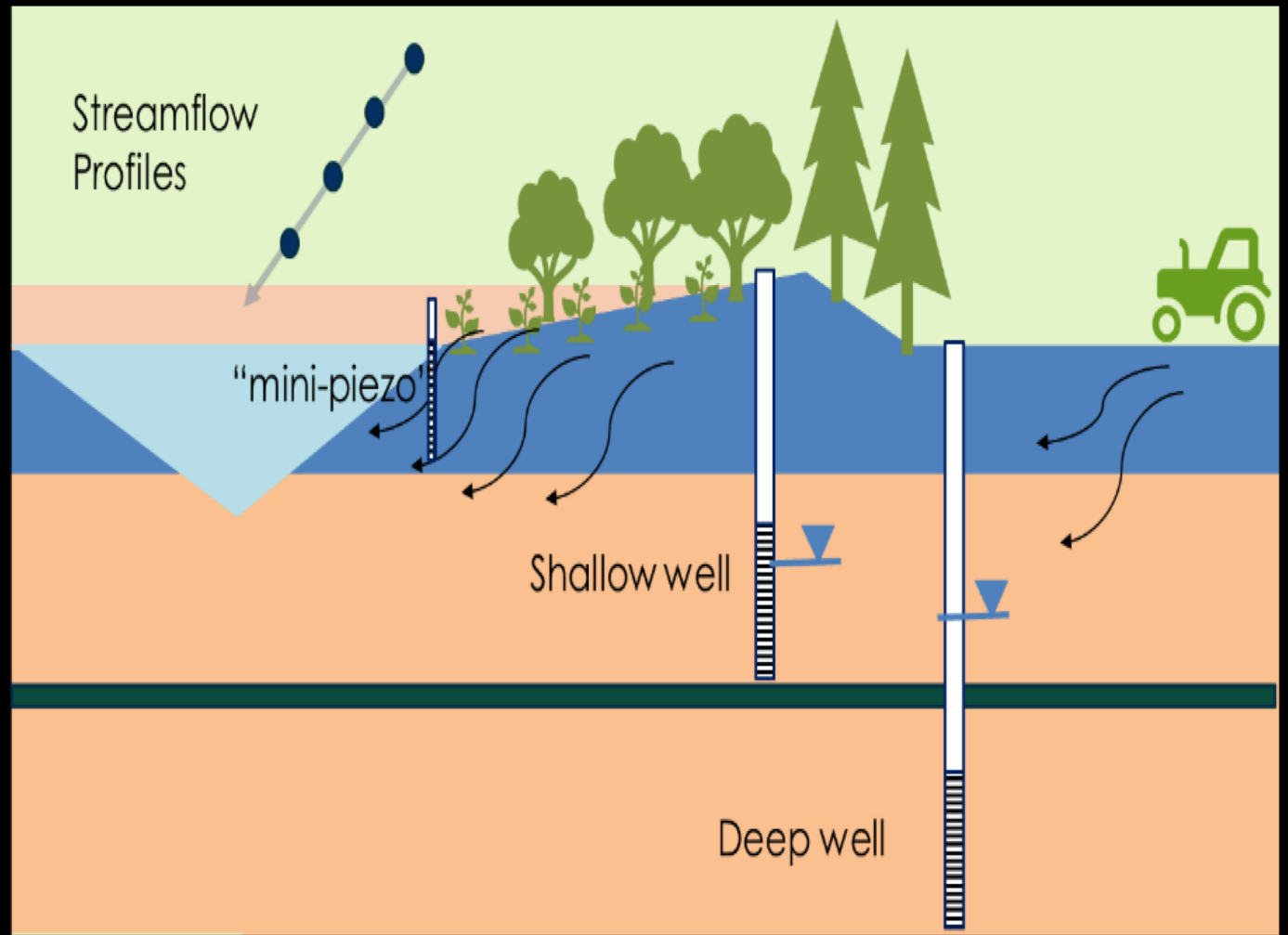




- **MO – USEPA Secondary Maximum Contaminant Level (MCL)**
  900 µS/cm
- **MT – USEPA Upper Secondary MCL**
  1,600 µS/cm
- **Values below these levels are acceptable for drinking water use**
- **Reported Values in Wyandotte Creek Oroville significantly below MO**
- **Data Gap in Wyandotte Creek South with values above 2,000 µS/cm in 1986 in one Well**

CHAPTER 3 – SUSTAINABLE MANAGEMENT CRITERIA
MEASURING SUSTAINABILITY - GROUNDWATER QUALITY

MEASURING SUSTAINABILITY INTERCONNECTED SURFACE WATERS

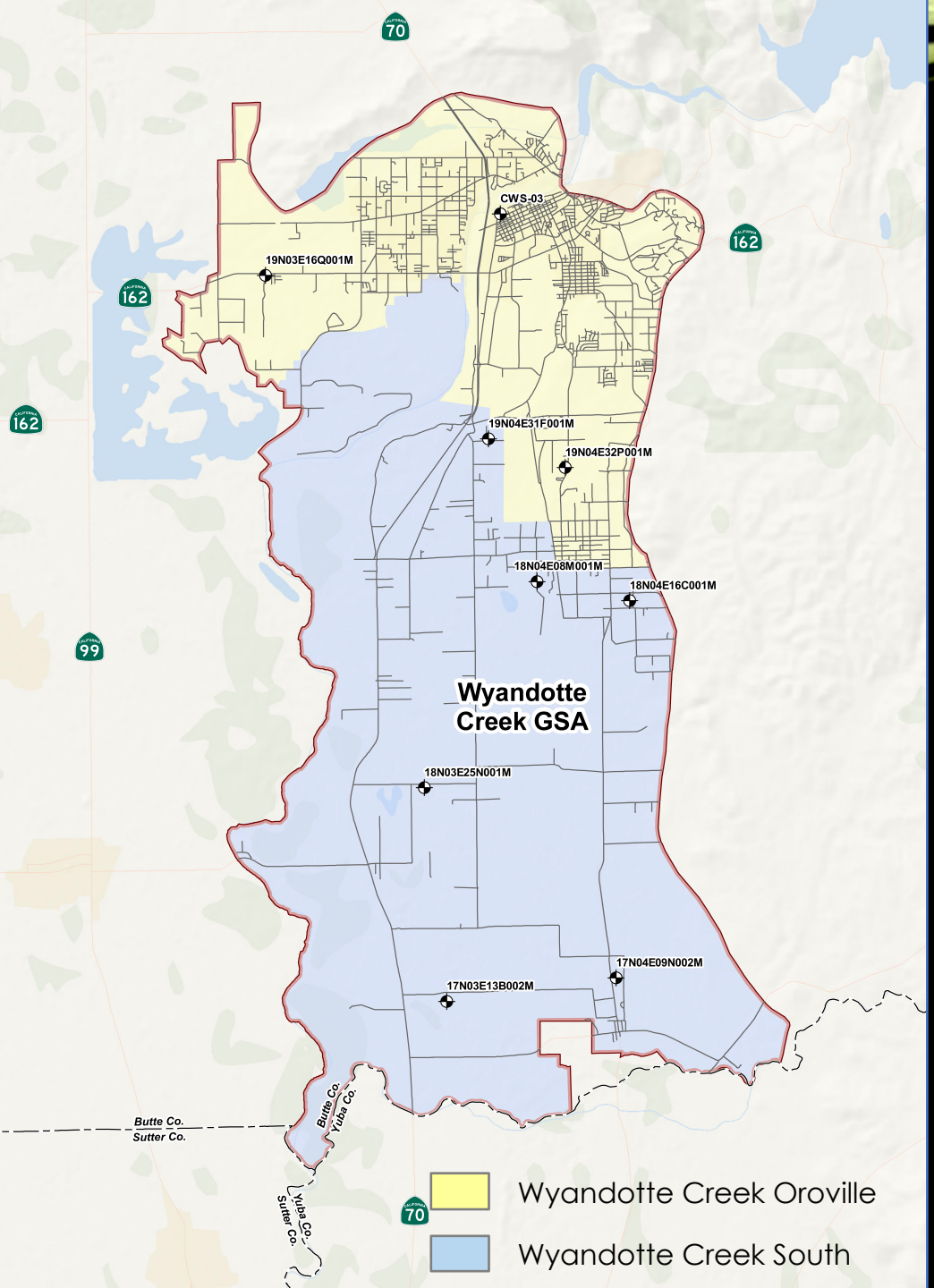


DATA GAP

- GSP Presents Framework to Develop SMCs
- Uses Groundwater Levels as Proxy Until Developed

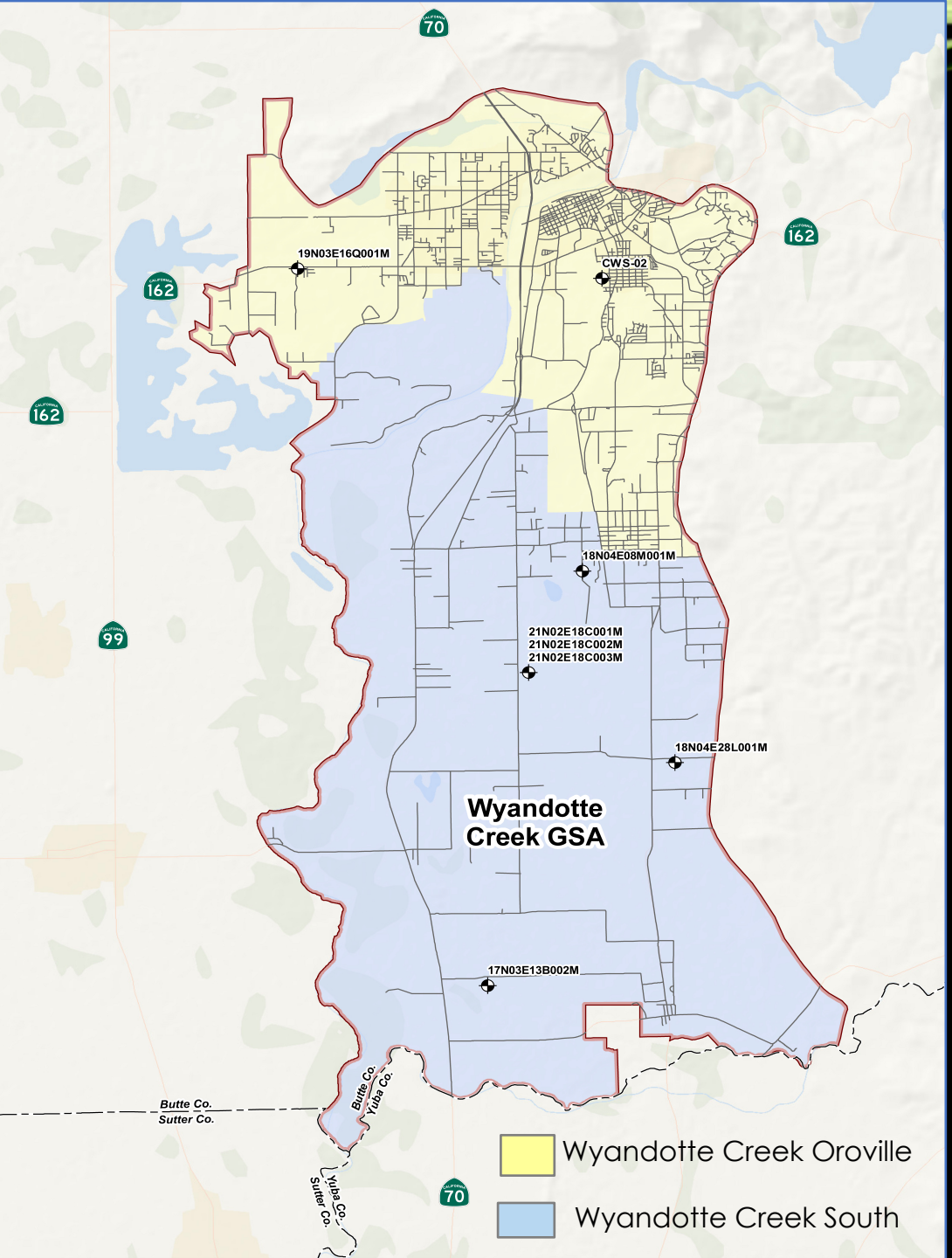
Where Sustainability Is Measured

CHAPTER 4 MONITORING NETWORKS



REPRESENTATIVE MONITORING SITES GROUNDWATER LEVELS

- Table 3.1 lists the MOs and MTs for Each RMS Well.
- Table 4.5 provides well construction details for each RMS Well.



REPRESENTATIVE MONITORING SITES WATER QUALITY

- Table 3.2 lists the MOs and MTs for Each RMS Well.
- Table 4.7 provides well construction details for each RMS Well.

CHAPTER 5 PROJECTS AND MANAGEMENT ACTIONS

How Sustainability will be Maintained

Projects

- 15 Projects Identified
  - 8 Planned
  - 5 Potential
  - 2 Conceptual

Management Actions

- 5 Management Actions Identified
  - General Plan Updates
  - Domestic Well Mitigation
  - Well Permitting Ordinance
  - Landscape Ordinance
  - Expansion of Water Purveyors

PLANNED PROJECTS

Residential Water Conservation

- Implement a series of urban water conservation measures
- 100 AF/year

Agricultural Irrigation Efficiency

- Implement a voluntary program to adopt BMPs for irrigation
- 4,000 AF/year

Flood MAR

- Utilize high flow water for direct recharge
- TBD AF/year

PLANNED PROJECTS

Oroville Wildlife Area Robinson's Riffle Project

- Restoration of wildlife area
- TBD AF/year

Streamflow Augmentation

- Utilize high flow waters to increase stream flow for use in-lieu of ground water
- 1,000 - 5,000 AF/year

TWSD Water Treatment Plant Capacity Upgrade

- Increased capacity of plant will reduce groundwater needs
- 550+ AF/year

PLANNED PROJECTS

Water Loss Monitoring

- Water providers to implement programs to reduce water loss
- TBD AF/year

Palermo Clean Water Improvement Project

- SFWP to expand service area to Palermo
- TBD AF/year

POTENTIAL PROJECTS

- Inter-Basin Water Transfer
- Agricultural Surface Water Supplies
- Well Upgrades
- Fuel Management for Watershed Health
- Removal of Invasive Species

CONCEPTUAL PROJECTS

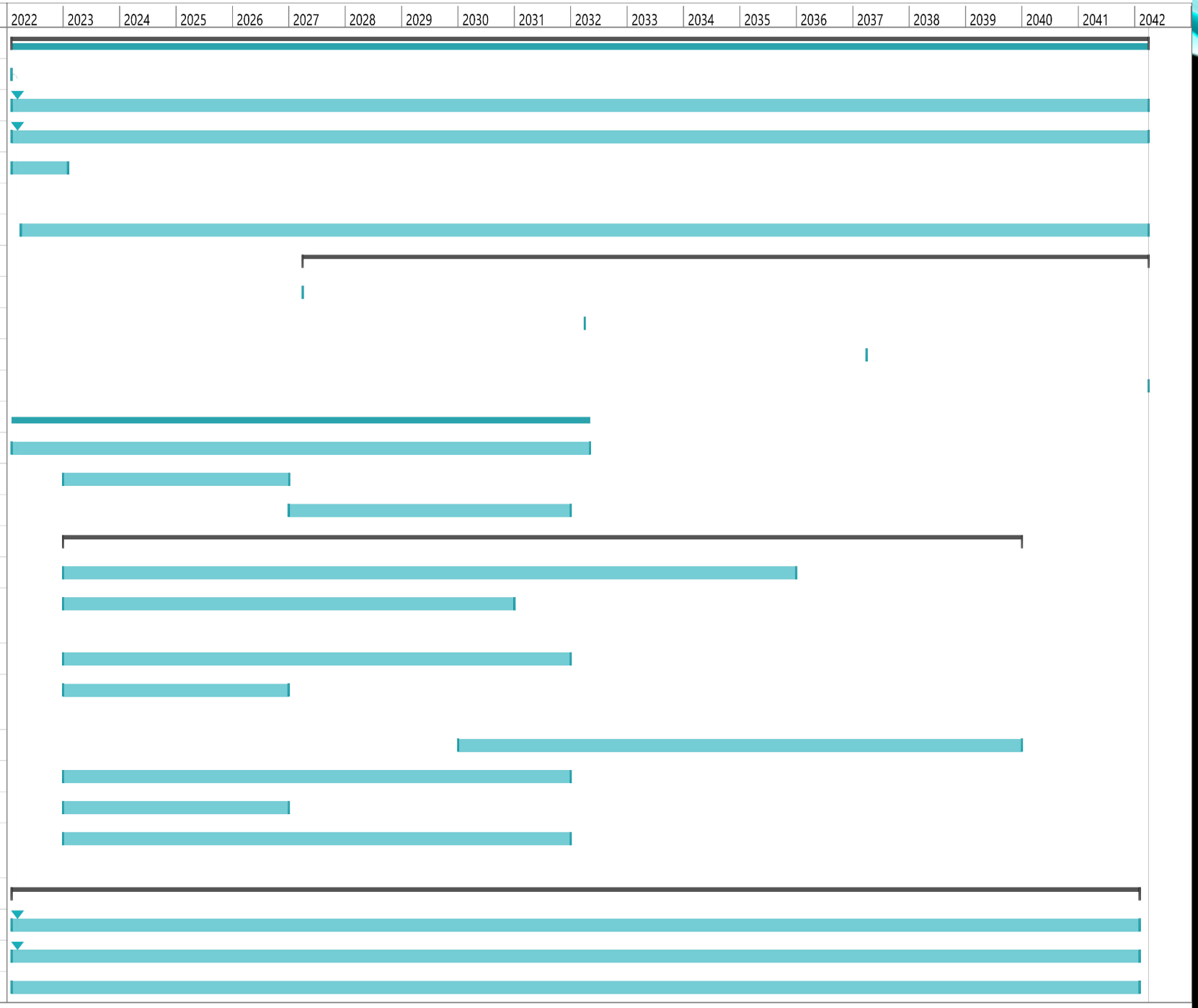
- Recharge Well
- Extend Orchard Replacement

CHAPTER 6 IMPLEMENTATION

Schedule, Funding, and Reporting

- Estimate of Costs
- Funding Alternatives
- Schedule
- Data Management System
- Annual Reporting
- Evaluation Report
- Interbasin Coordination

ID	Task Name	Start	Finish
1	**GSP Implementation**	**1/31/22**	**4/1/42**
2	GSP Submittal	1/31/22	1/31/22
3	Public Outreach	2/1/22	4/1/42
4	Monitoring	2/1/22	4/1/42
5	Develop Intial DMS	2/1/22	2/1/23
6	**Annual Reports**	**4/1/22**	**4/1/42**
28	Interbasin Coordination	4/1/22	4/1/42
29	**Five Year Updates**	**4/1/27**	**4/1/42**
30	2027 Update	4/1/27	4/1/27
31	2032 Update	4/1/32	4/1/32
32	2037 Update	4/1/37	4/1/37
33	2042 Update	4/1/42	4/1/42
34	**Data Gaps**		
35	Contour Mapping	2/1/22	5/5/32
36	Update Butte Basin Model 1	1/1/23	1/3/27
37	Update Butte Basin Model 2	1/1/27	1/1/32
38	**Project Implementation**	**1/1/23**	**1/1/40**
39	Project 1: Residential Conservation	1/1/23	12/31/35
40	Project 2: Agricultural Irrigation Efficiency	1/1/23	1/1/31
41	Project 3: Flood MAR	1/1/23	12/31/31
42	Project 4: Oroville Wildlife Area Robinson's Riffle Project	1/1/23	12/31/26
43	Project 5: Streamflow Augmentation	1/1/30	1/1/40
44	Project 6 TWSD Plant Upgrade	1/1/23	1/1/32
45	Project 7: Water Loss Monitoring	1/1/23	1/1/27
46	Project 8: Palmero Water Improvement	1/1/23	1/1/32
47	**Adaptive Management**	**2/1/22**	**2/2/42**
48	Evaluate Potential Projects	2/1/22	2/2/42
49	Evaluate New Projects	2/1/22	2/2/42
50	Evaluate Management Actions	2/1/22	2/2/42



COST ESTIMATE OF GSP IMPLEMENTATION

Administrative Costs

- $100,000 - $300,000/year

Monitoring

- $20,000/year

Data Analysis

- $10,000/year

Reporting and Evaluation

- $30,000/year

Data Gaps

Projects and Management Actions

FUNDING ALTERNATIVES

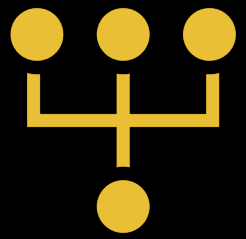
Existing funding and programs to minimize overlap

State and federal grants

Other funding mechanisms (i.e., Prop 218 or 26)

INTER-BASIN COORDINATION

Participate in on going coordination efforts with surrounding 10 basins



Norther-Valley Inter-basin Coordination

Provides a framework for coordination efforts

Discussions to determine GSA priorities

CLARIFYING QUESTIONS