GSPAC — Big Valley Updates, GSP Education and Discussion
July 23, 2021
Big Valley Groundwater Updates
Technical Support Services

TSS General Application

• One application per subbasin
• Includes general questions about SGMA process, current funding programs within the Basin (e.g., How many GSPs?)
• Applicants must describe “the most challenging technical needs of the Basin”.
• Potential projects could include:
  1. Monitoring well installation
  2. Groundwater level monitoring training
  3. Borehole video logging
  4. Other field activities

Progress:
• Coordinate with regional DWR contact
• Groundwater Quality Sampling and Analysis
• Future Plan - Propose 1 multi-completion monitoring wells. One well per subbasin typically allowed.

Technical Support Services
for
Groundwater Sustainability Plan Development and Implementation

How to Apply:
Applications for TSS will be evaluated on a continuous basis as funding allows. The application process is two-part – a General Application and Individual Service Requests – and must be submitted through an online application system made available to the applicant following consultation with DWR Region Offices. PDF and MS Word copies of the General Application and Service Requests are provided as a resource to help applicants prepare for applying.

Applicants are encouraged to contact a Region Coordinator at sgma_rc@water.ca.gov to discuss the type and level of services needed prior to submitting an application. For additional information on DWR’s Technical Support Services and other assistance offerings visit, https://www.water.ca.gov/Programs/Groundwater-Management/Assistance-and-Engagement.
Technical Support Services Update

Figure 1. Locations of Wells with TDS Concentration Timeseries Graphs
Nine wells have been identified to sample for groundwater quality (Fig. 1). These wells are already integrated into the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. Well owners already cooperate with biannual groundwater elevation monitoring performed by the Lake County Watershed Protection District.

The nine wells will be added to a network of groundwater quality monitoring wells in DWR’s Water Data Library. This online platform allows for public access of groundwater quality data. It also provides groundwork for repeated sampling events, which are necessary to track temporal trends in groundwater quality.
Groundwater sampling will involve direct sampling from an existing well pump at the closest point of distribution from the well, such as from a valve or spigot in the pipeline connecting the well-head to the water storage tank. Sampling from further down the distribution line has the potential to introduce contaminants associated with the piping system, rather than local groundwater. If a well has been in regular use it does not need to be purged completely for a representative sample, however, water should be allowed to flow for several minutes prior to sampling to flush the plumbing system.

Standard groundwater quality parameters will include nutrients, mineral characters, and trace elements. Nutrients provide evidence of nutrient leaching from agricultural areas, livestock, or septic systems. Minerals and salts can influence the palatability and irrigation value of water. And some trace elements and metals can cause health and environmental problems.
Technical Support Services Update

- Install one multi-completion monitoring well
- Well location will be identified after HCM is completed and discussed with GSPAC
- Preferred location would be on County property
- Private property is an option but would require an access agreement (becoming more common)
Survey Area Overview

- Big Valley, Ukiah Valley, Napa Valley, Sonoma Valley, Santa Rosa Plain, Petaluma Valley
- Surveys would start in October; survey length, approximately 1 week.
- Data likely available until April 2022.
- *Determine whether area will be surveyed by early September.*
- *If area not surveyed in October, will be surveyed in Spring 2022.*
Airborne Electromagnetic (AEM) Method Overview

Project Implementation

- Funded through Proposition 68 and the General Fund.
- Conducted in all high- and medium-priority basins, where data collection is feasible.
- Data collected in coarse grid of approx. 2 by 8 mi spacing, oriented to capture major geologic structure.
- Grids edited to collect data over GSA, and state and federal agency important areas.

Modified from DWR, 2022
Airborne Electromagnetic (AEM) Method

- Geophysical method with equipment towed beneath helicopter.
- Signal bounces off layers in the subsurface and measures the electromagnetic (EM) response of subsurface materials.
- Create a 2-dimensional image of EM properties (shown as electrical resistivity or conductivity).

Depth of investigation: ~1,000 feet
Vertical resolution:
  - Shallow: ~5-10 feet
  - Depth: ~100 feet

Modified from DWR, 2022
AEM Overview

Airborne Electromagnetic Method

- 30 m (100 ft) above the ground
- 80 km/hr (50 mph)
- ~300 m (1000 ft)
- 250-350 km (150-220 miles) flown in a day
AEM Overview

AEM Interpretation Workflow

Well Data
- lithology
- resistivity

AEM Data

Inversion

Resistivity Model

- Increasing salinity
- Fresh water
- Increasing clay
- Unsaturated sediments
- Clay (fresh)
- Sand/gravel
- Granite

Resistivity (Ohmm)
AEM Overview

CONDUCTIVE MATERIALS
fine-grained materials (slit, clay)

RESISTIVE MATERIALS
coarse-grained material (sand, gravel)
Logistics POC

DWR’s consultant (Ramboll) will reach out with site specific survey logistic questions:

- Location of unmapped overhead powerlines
- Information about local permits and regulations
- Local contacts (nature reserves, military areas)
- Activities on terrain (e.g. para gliders air shows, shooting ranges)
- Animals (e.g. cattle and horses, seasonal critical species)
- Difficult landowners

Modified from DWR, 2022
AEM Overview

Outreach Materials

- AEM website
  https://water.ca.gov/Programs/SGMA/AEM
- Prop 68 Fact Sheet
- Existing Data Fact Sheet
- Survey schedule & map
- 2-minute AEM video (New!)
- Frequently Asked Questions (New!)
- Presentation slide deck
- News release
- Social media announcements
- Survey notification letter
GSP Education and Discussion
Groundwater Conditions Update

Bulletin 118 basin descriptions (drafted in 2004):

**Big Valley:**


**Map referenced in the description:**


- Possibly the Mesozoic ultrabasic intrusive rocks could be potentially why they separated the two basins, however the don’t explicitly explain in the description why there is a boundary, and they also note they could be hydrologically connected.
- In regards to SGMA, the current basin boundary is where SGMA is applicable.

**Scott’s Valley description:**

Groundwater Budgets (Support Chapter 2 & Chapter 3)

1. Surface Water System
2. Land System
3. Groundwater System
GSP Education and Discussion
June 9 Lake County Field Visit and Meetings

Lake County Water Resources Department
Scott De Leon
William Fox

Peter Windrem – GSPAC Member
Scott Hornung – Special Districts & GSPAC Member

LSCE and Santec
Ibrahim Khadam
Eddy Teasdale
John McHugh
Maliheh Karamigolbaghi
Evan Davis
Highland Springs and Adobe Reservoirs
Highland Springs and Adobe Reservoirs
Kelsey Creek Detention Structure
Kelsey Creek Detention Structure
Lower Kelsey Creek at Main St Bridge
Lower Kelsey Creek at Main St Bridge
Downstream view
Lower Kelsey Creek at Main St Bridge
*Upstream view*
GSP Section Review
• Comment log and updates to text complete for Sections 1 and 2.1
  • Well data
  • Clear Lake hitch
  • Data disclaimers

• Section 2.2.2 and 2.2.3 feedback was due 7/21 and in process of organizing it

QUESTIONS? REACTIONS?
• Geologic Setting
• Stratigraphy & Aquifers
• Boundary Condition
• Hydrogeologic Characteristics
Geologic Setting

• **Surface Geology**
  • QI, Qal, Qk, Volcanic, Franciscan Fm

• **Faults**
  • Big Valley Fault, Adobe Creek Fault, Wright Way Fault

• **Cross Sections**
  • A-A’ through to H-H’
  • DWR Well Completion Reports
  • CalGEM Geothermal Well Logs
Stratigraphy & Aquifers

• Stratigraphy
  • Q1, Qa1, Qk
  • Clear Lake Volcanics
  • Jurassic-Cretaceous (Franciscan Fm)

• Aquifers
  • Alluvium
  • Volcanic Ash
  • Fracture
Stratigraphy & Aquifers

- Stratigraphy
  - Ql, Qal, Qk
  - Clear Lake Volcanics
  - Jurassic-Cretaceous (Franciscan Fm)

- Aquifers
  - Alluvium
  - Volcanic Ash
  - Fracture
Boundary Conditions

- Precipitation Recharge
- River Leakage
- Lake Boundary (North)
- No Flow Boundary
  - East (perpendicular to contour line)
  - West
- Mountain Front Recharge (South)
Hydrogeologic Characteristics

Transmissivity (ft²/d)

- Alluvium Aquifer: 2 - >100,000
- Alluvium/Volcanic Material Aquifer: 50 - >5,000
- Alluvium/Fractured Bedrock Aquifer: 10 - >6,000
- Fractured Bedrock Aquifer: 2 - >2,000
Future Ad Hoc Meetings
### Big Valley Basin GSP Subcommittee and Ad Hoc Meetings

| Individual       | Affiliation                                  | GSPAC Member | Notes                                           | Integrated Hydrologic Modelling | Projects and Management Actions | Sustainable Management Criteria | Groundwater Dependent Ecosystems | GSP Implementation/Finance |
|------------------|----------------------------------------------|--------------|------------------------------------------------|-------------------------------|---------------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------|
| Sarah Ryan       | Big Valley Band of Pomo Indians,             |              |                                                |                               |                                 |                                |                                |                               |                             |
| Scott Hornung    | Lake County Special Districts               |              |                                                | x                             | x                               | x                               | x                               | x                             |
| Marina Dellianni| Lake County Watershed Protection District    |              | Long-term Stakeholder Engagement and Outreach suggested to be included in GSP Implementation/Finance group |                               |                                 |                                |                                | x                             |
| Kyle Reams       | Kelseyville Unified School District         |              | Have no info on him                            |                               |                                 |                                |                                | x                             |
| Brenna Sullivan  | Lake County Farm Bureau                     |              |                                                | x                             | x                               | x                               |                                | x                             |
| Peter Windrem    | Chi Council for the Clear Lake Hitch,       |              |                                                |                               |                                 |                                |                                | x                             |
| David Weiss      | Bella Vista Farming Company                 |              | Unsure if this reflects only David's interest or if this reflects Sky's and David's interest since they call in together |                               |                                 |                                |                                | x                             |
| Pat Scully       | Scully Packing Company                      |              |                                                | x                             | x                               | x                               |                                | x                             |
| Valerie Nixon    | Lake County Land Trust                      |              |                                                |                               |                                 |                                |                                | x                             |
| William Fox      | Lake County Watershed Protection District    |              |                                                |                               |                                 |                                |                                | x                             |
| Yuliya Osetrova  | Lake County Watershed Protection District    |              |                                                |                               |                                 |                                |                                |                               |
| Bethany          | FlowWest, Environmental Consultant          |              | Works with Sarah Ryan                          |                               |                                 |                                |                                | x                             |
| Marilza Flores   | Stantec, FSS/ GSP Facilitation Team         |              |                                                |                               |                                 |                                |                                |                               |
SMC Subcommittee

- Meeting #1 – Introduction to SMCs and proposed representative monitoring sites – Week of 8/2 (John/Ibrahim)
- Meeting #2 – Groundwater quality and subsidence - Week of 8/9 (Eddy)
- Meeting #3 – Groundwater levels and change in storage (meeting #1) – Week of 8/16 (Eddy)
- Meeting #4 – Surface water depletion (meeting #1) – Week of 8/23 (Ibrahim)
- Meeting #5 – Surface water depletion (meeting #2) – Week of 8/30 (Ibrahim)
- Meeting #6 – Review and confirm all SMCs – Week of 9/6 (Eddy)
• Meeting #1 – Identification of GDEs - Week of 8/9 (Ibrahim/Mali)

• Meeting #2 – Groundwater management potential effects on GDEs – Week of 8/16 (Ibrahim/Mali)

• Meeting #3 – Monitoring and management actions for GDEs – Week of 8/30 (Ibrahim/Mali)