Groundwater Monitoring Implementation Project

Update
Monitoring Well
Site Selection

Joe Zilles, PG, C-57

December 10, 2025

EASTERN SAN JOAQUIN GROUNDWATER AUTHORITY

KLEINFELDER
Bright People. Right Solutions.

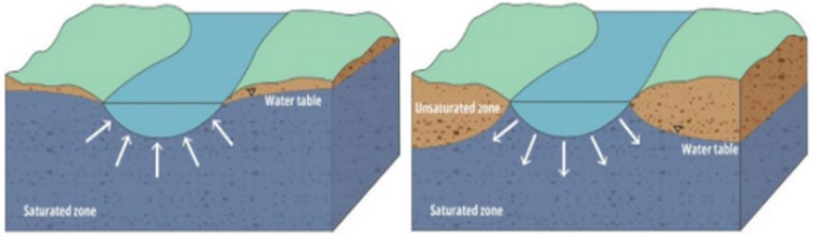
Undesirable Results within the Subbasin:

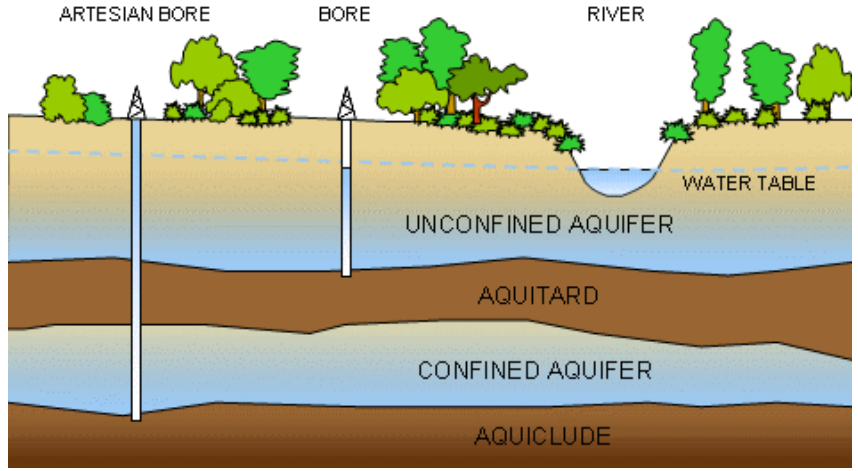
1. Chronic Lowering of Groundwater Levels (HCM)
2. Reduction in Groundwater Storage (HCM)
3. Degraded Water Quality
4. Depletion of Interconnected Surface Water (ISW) affecting Groundwater Dependent Ecosystems (GDEs)
5. Seawater Intrusion
6. Land Subsidence

KLEINFELDER
Bright People. Right Solutions.

Issue: Data Gaps exist within the Subbasin

- ISWs, GDEs and their relationship
  - Wells near streams needed
  - Identify Natural Communities Commonly Associated with Groundwater (NCCAG). Reclassify as GDEs if appropriate
  - Understanding how ISWs impact GDEs
- Groundwater Levels
  - Data near streams, Subbasin boundaries, and Subbasin groundwater depression
- Groundwater Quality
  - Spatial distribution, well construction data, monitoring frequency and additional constituents

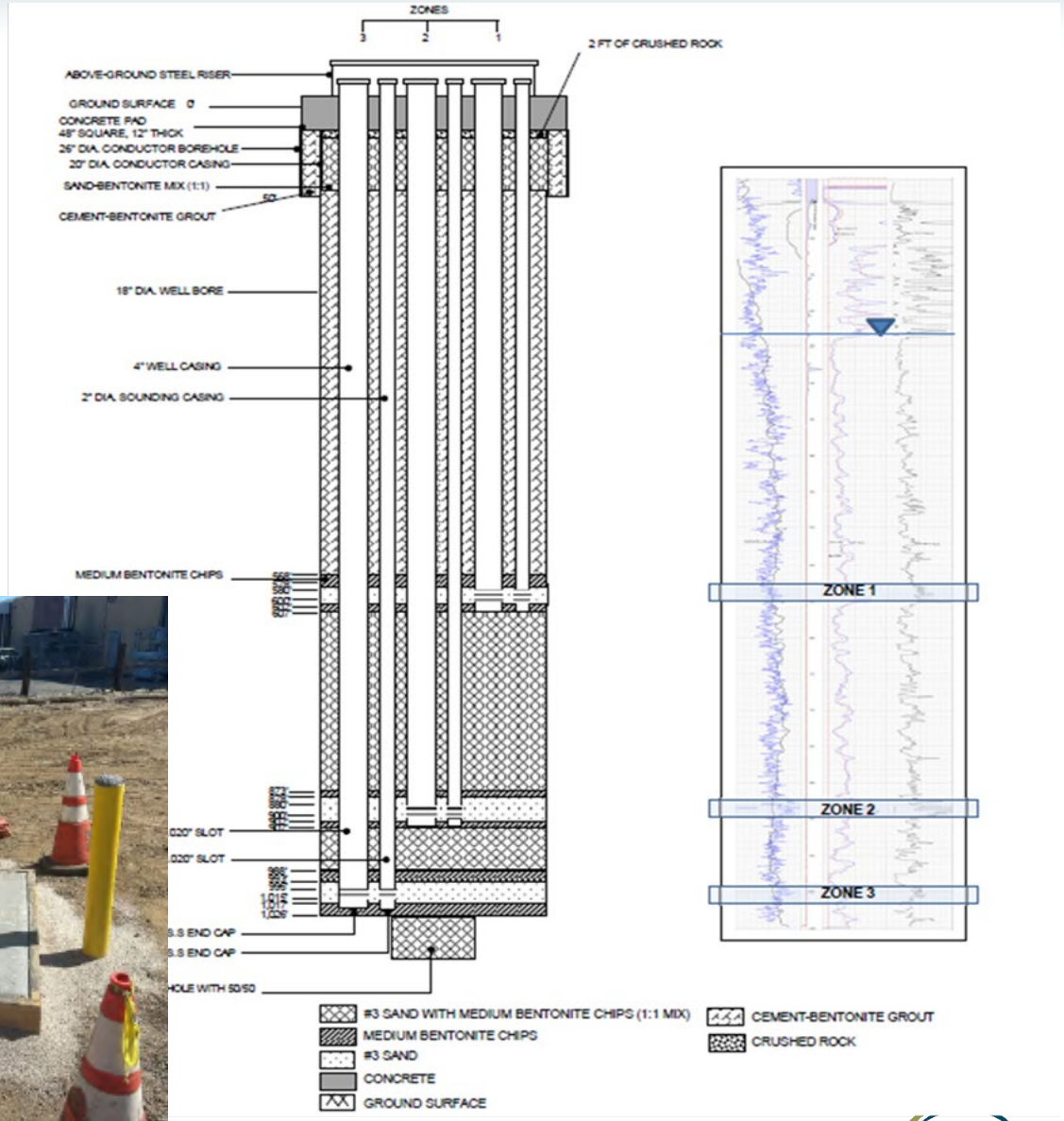




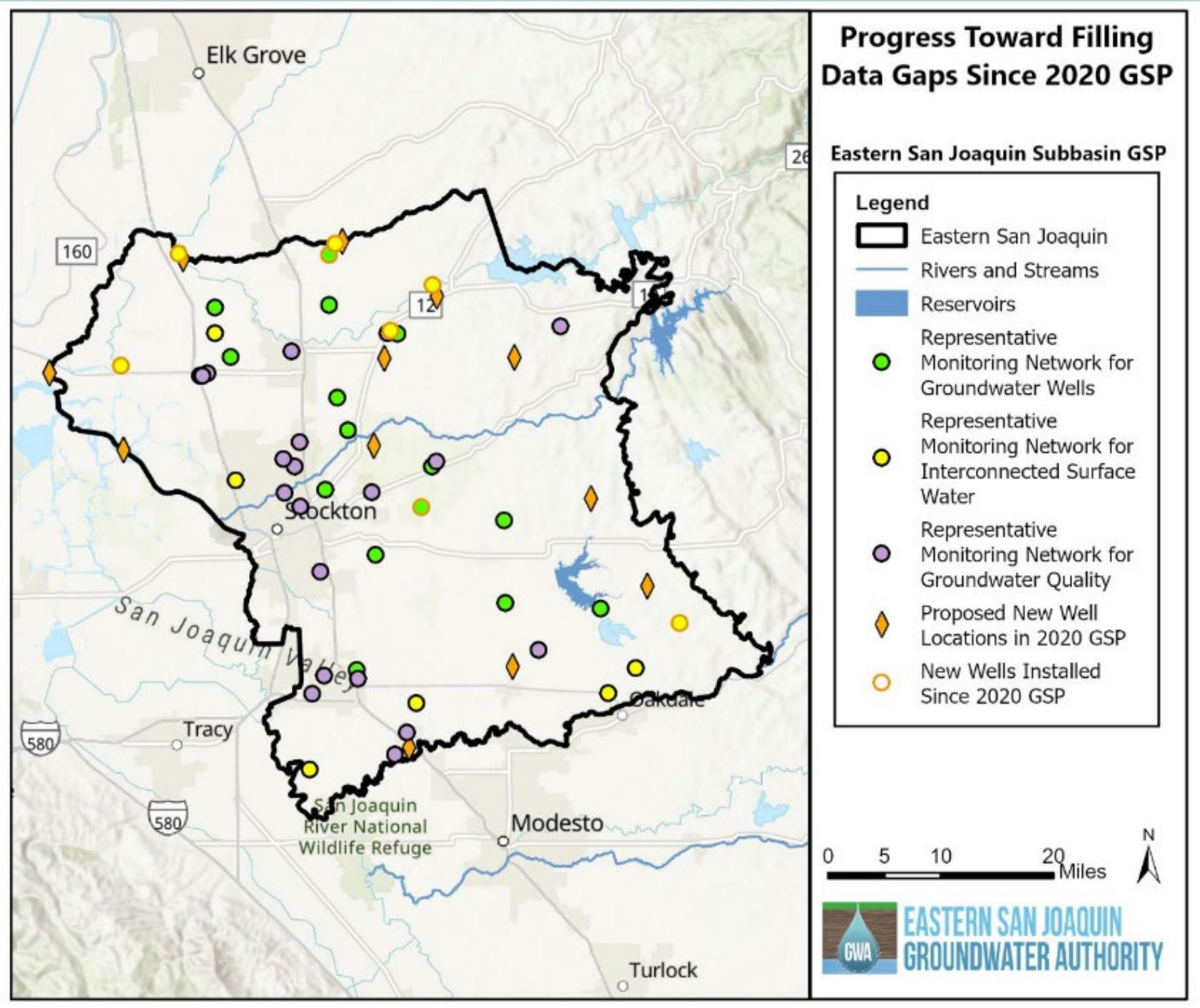
KLEINFELDER
Bright People. Right Solutions.

TYPICAL NESTED MONITORNG WELL

- 18-inch borehole
- Three screened zones for monitoring separate aquifer/zones
- 4-inch casings for dedicated pump
- 2-inch casings for water-level measurements and data logger transducer

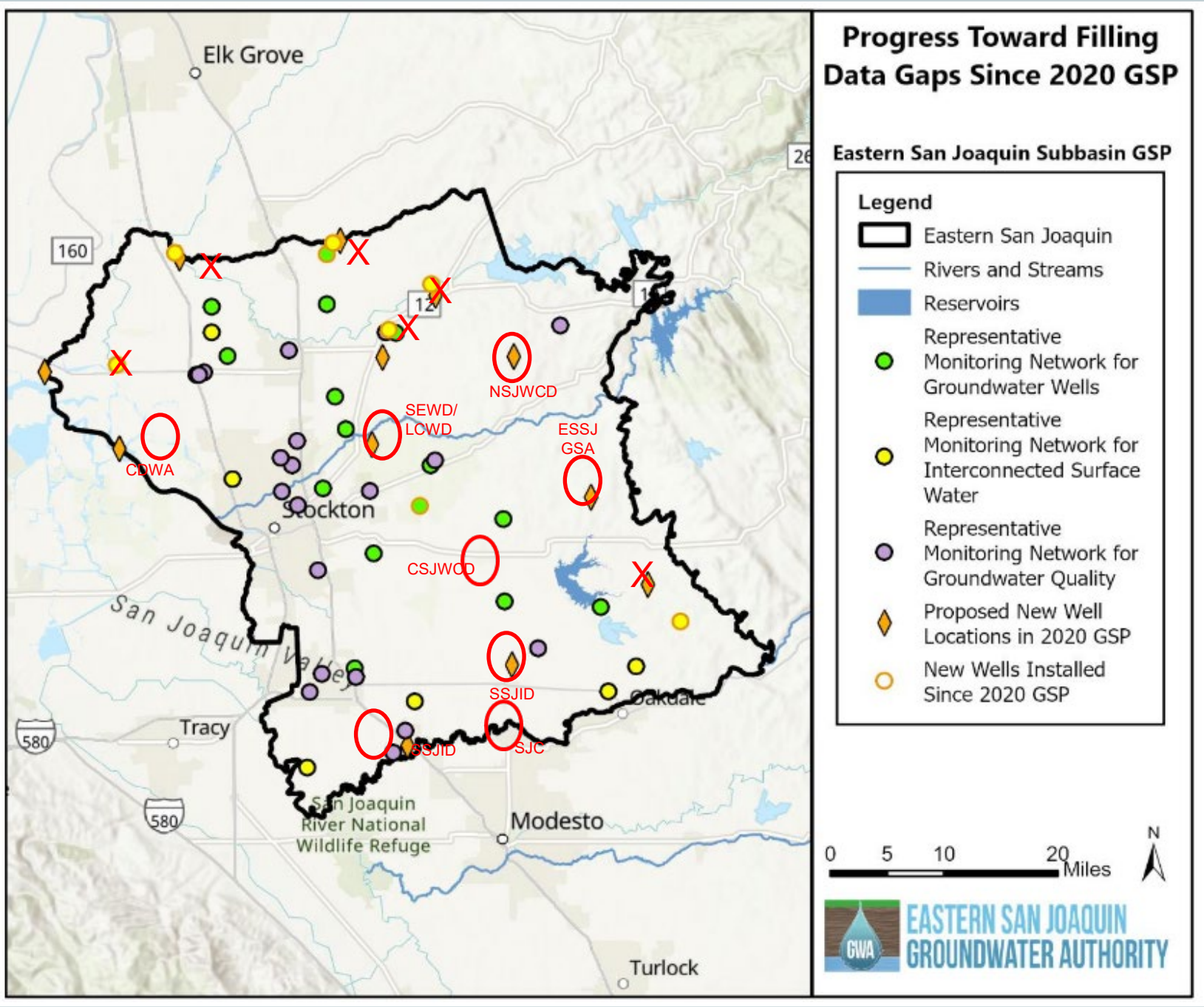


KLEINFELDER
Bright People. Right Solutions.



GSP Proposed New Monitoring Wells at 12 Candidate Sites (Orange Diamonds)

KLEINFELDER
Bright People. Right Solutions.



Since 2020:

6 Locations Completed: X

6 Remaining Locations:

Potential Site GSAs include:

- SJC
- CDWA
- NSJWCD
- SEWD
- LCWD
- CSJWCD
- ESSJ GSA
- SSJID

KLEINFELDER
Bright People. Right Solutions.

Request for Information

- 8 RFIs sent Oct 22
  - (LCWD, SEWD, CDWA, NSJWCD, CSJWCD, SSJID, SJC, ESSJ)
- We received 7 responses from initial RFI list (LCWD, NSJWCD, CSJWCD, SSJID, SJC, Stanislaus County for ESSJ, CDWA, plus Calaveras County.

KLEINFELDER
Bright People. Right Solutions.

GSA Jurisdiction	Number of Potential Sites	GW Levels	GW Quality	Interconnected Surface Water	Groundwater-Dependent Ecosystems
Central Delta Water Agency	4	x	x	x	x
Stockton East Water District	5	x	x		
Linden County Water District	6	x	x		
Eastside San Joaquin GSA	4	x	x		
North San Joaquin Water Conservation District	1	x	x		
Central San Joaquin Water Conservation District	2	x	x	x	x
San Joaquin County 1	1	x	x	X	x
South San Joaquin Irrigation District	7	X	X	X	x

KLEINFELDER
Bright People. Right Solutions.

Candidate Sites for Projects

- LCWD – Deep nested well on former District Well #3 site. Include data logging equipment.
- NSJWCD – Deep nested well. Include data logging equipment.
- CSJWCD – Shallow ISW/GDE well in Farmington between Littlejohns and Duck Creeks (School District property). Include data logging equipment. CSJWCD working to secure a location.
- SSJID – Deep Nested well, ISW, WQ, southern basin boundary conditions. Include data logging equipment. SSJID considered three of the suggested locations.
- ESSJ/Calaveras County – Add data recording equipment to existing USGS monitoring wells (2 to 3) owned by Calaveras County within the ESSJ GSA.

KLEINFELDER
Bright People. Right Solutions.

Ranking Criteria: 5 Categories

- Data Gaps
- Candidate Site Locations
- Land Ownership
- Operational Costs
- Costs to Complete Well Installation Projects (pending ranking)

KLEINFELDER
Bright People. Right Solutions.

Ranking Criteria: Data Gaps

Filling data gaps is a high priority and the key to achieving sustainability goals.

- Interconnected Surface Waters
- Groundwater Dependent Ecosystems
- Groundwater Levels:
  - near streams
  - near Subbasin boundaries
  - near the Central Subbasin groundwater depression
- Groundwater Quality from Multiple/Nested Completion Wells

KLEINFELDER
Bright People. Right Solutions.

Ranking Criteria: Candidate Site Location

Site location conditions and surrounding area conditions have a considerable impact on candidate site feasibility.

- Site Accessibility:
  - Paved roads, dirt roads, access trails etc.
- Site Terrain/Slope:
  - Level, relatively level, uneven surfaces, etc.
- Surface Conditions:
  - Paved and compacted surfaces, dense native soil vs. soft native soil, presence and density of vegetation, etc.
- Site Resources:
  - Accessibility to water and power near candidate site

KLEINFELDER
Bright People. Right Solutions.

Ranking Criteria: Land Ownership

The land ownership of potential project site locations can greatly affect the difficulty, cost, and timely manner in which groundwater monitoring wells are constructed.

- Land Owned by a GSA or part of the ESJGWA:
  - City and County-owned lands (parks, schools, maintenance facilities, etc.) are preferable.
- Privately-Owned Land:
  - Agricultural, undeveloped land, etc., will require a coordinated Right of Entry agreement with private property owners.
- Federally-Owned Land:
  - Encroachment permits, environmental reviews, and various Federal requirements can limit ease of securing a candidate site.
- Land Within 300-feet of a Levee:
  - Encroachment permits and regulatory hurdles with the Central Valley Flood Protection Board may be prohibitive.
- Protected Lands:
  - Wildlife refuges, preserves, and areas with conservation easements are viewed as prohibitive.

KLEINFELDER
Bright People. Right Solutions.

Ranking Criteria: Operational Costs

Operational costs for well maintenance and data collection can be attributed to the factors below.

- Site Accessibility:
  - Is the site accessible via paved roads or via difficult access on unmaintained roads?
- Vegetation Maintenance:
  - How frequently does vegetation need to be cut back for site/well access?
- Cell Phone Coverage:
  - Will data be collected via telemetry system (using cellular) vs. field staff site visits?
- Power Source Availability for Telemetry Systems:
  - If telemetry, is the system power source hardwired or solar panels?
- Potential for Vandalism:
  - Unmonitored infrastructure such as solar panels are at risk for vandalism and/or theft.

KLEINFELDER
Bright People. Right Solutions.

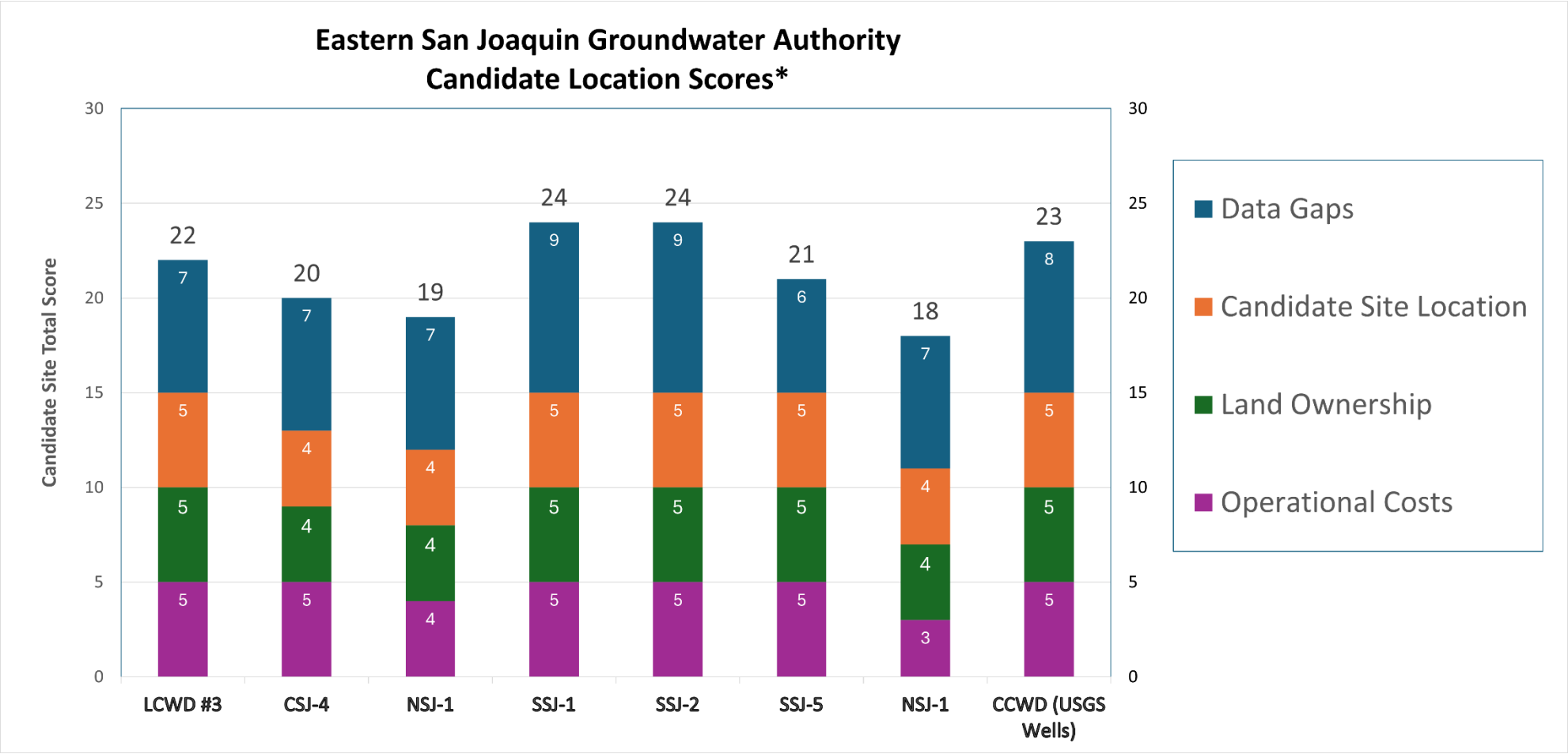
Ranking Criteria: Costs to Complete Project

The overall cost to complete a well installation project must be weighed against the data gap(s) to be filled; however, inexpensive projects can potentially allow for the funding of more completed projects. Costs to complete each well may vary widely and depend on multiple factors such as targeted depths, well construction details, anticipated site/subsurface conditions, and applied drilling methods.

- Shallow Wells:
  - $40,000 to $85,000
- Deep Wells:
  - $100,000 to $200,000
- Multi-Completion Wells:
  - $140,000 to $240,000

KLEINFELDER
Bright People. Right Solutions.

Ranking Results



* Well installation costs to complete each project have not yet been factored into the above scores.

KLEINFELDER
Bright People. Right Solutions.

Next Steps

- Finalize Site Selection(s)
- Develop Rough Order of Magnitude Cost estimates
- Develop Project Descriptions and Scope of Work
- Advertise Projects
- Award Projects
- Build Projects

KLEINFELDER
Bright People. Right Solutions.

ACTION ITEMS AND SCHEDULE

- Dec 2025 COMPLETE SITE SELECTIONS
- Dec 2025 DEVELOP PROJECT SCOPE(S)
- Jan 2026 ISSUE RFP(S) FOR WORK
- **WORK BEGINS EARLY 2026**
- **WORK MUST BE COMPLETED BY DEC 31, 2026**

KLEINFELDER
Bright People. Right Solutions.

KLEINFELDER
Bright People. Right Solutions.