



# Well Permit Testing Update - May 2024

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science | policy | solutions

# Approach to comply with Executive Order

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- Use Butte Valley as example
- Evaluate depth and capacity of wells and run model scenarios looking at hypothetical new wells with a combination of depth and capacity
- Evaluate drawdown at the well and radius of influence
- Next steps:
  - Develop a well inventory to include consideration of possible impact to nearby wells
  - For each zone within the Butte valley basin, develop tables with criteria to provide preliminary guidelines
  - Same approach can be then implemented in Scott and Shasta

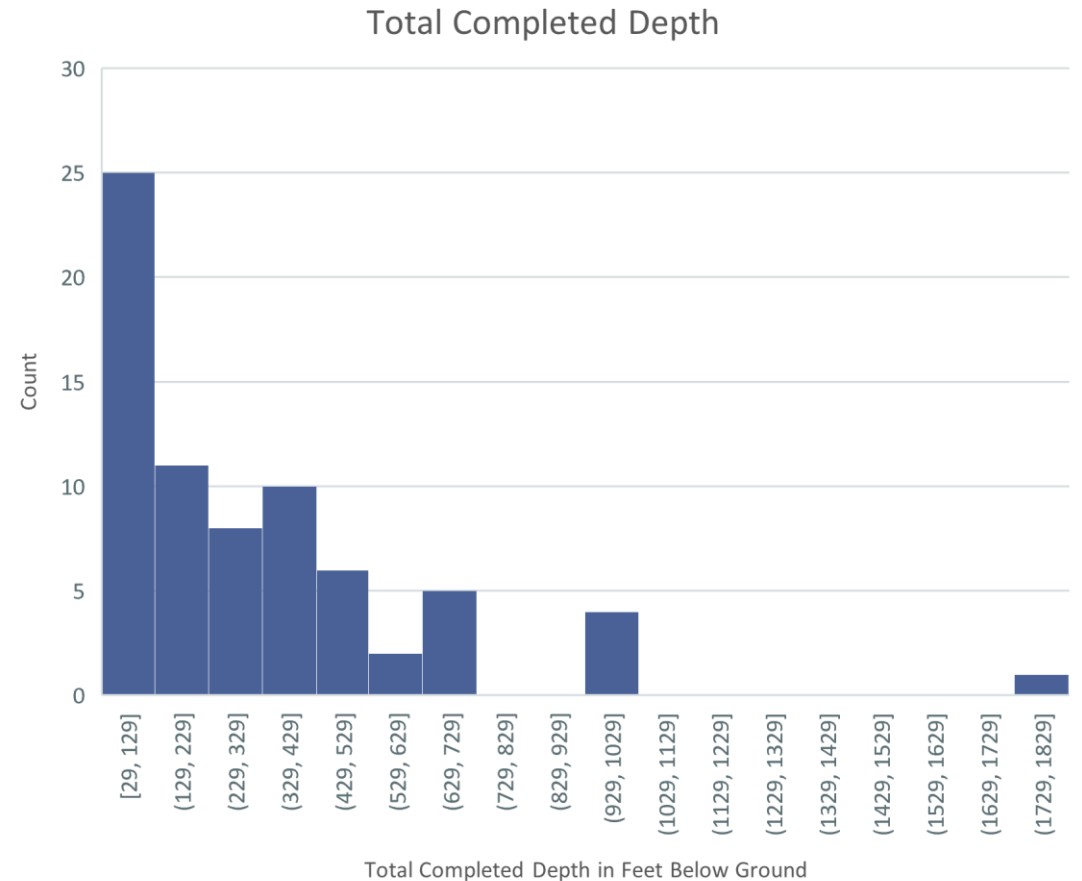
# DWR Well Completion Report dataset

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- Not all wells provide reports
  - Not all drillers pump test data
  - Pumping rates may be wrong
  - The best available data for an initial study
- Only considering non-exempt wells under the Executive Order
  - Only considering wells since 1989 to gain an understanding of recent conditions

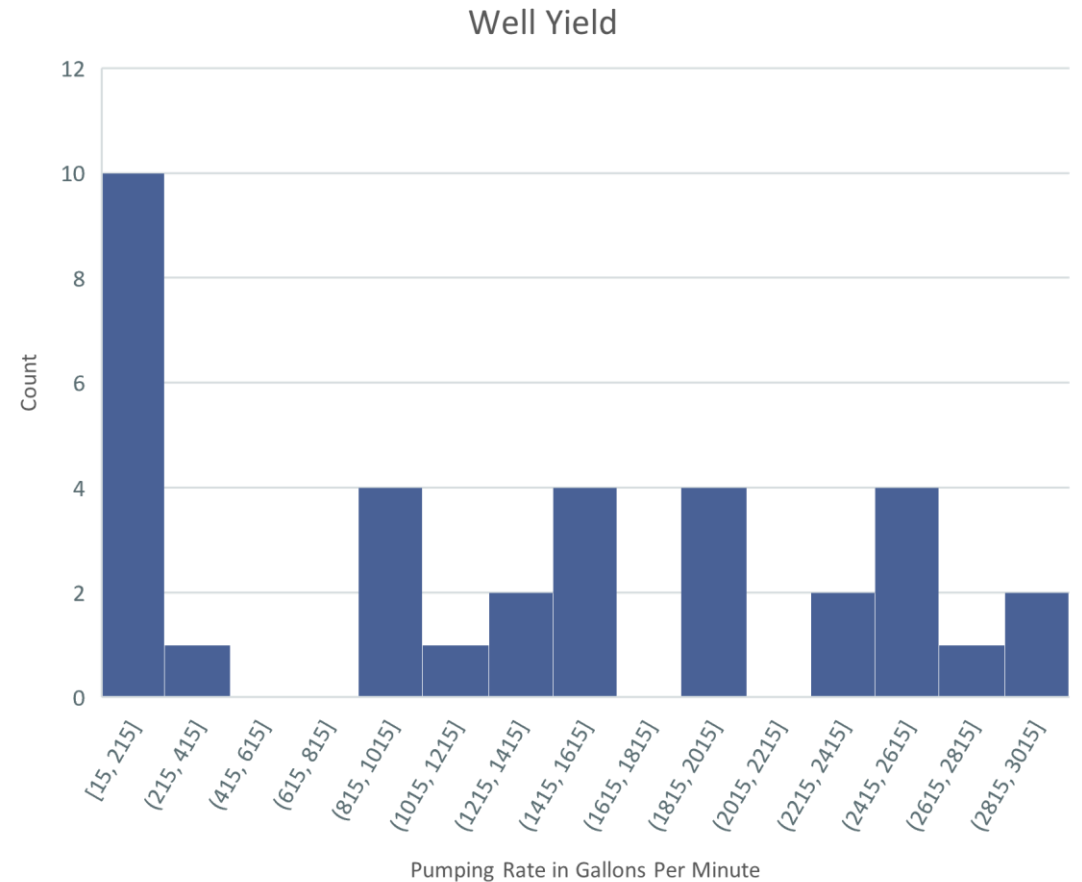
# Total Depth of non-exempt wells in Butte

- Total Completed Depth dataset is complete. All wells provide depth data
- The average depth is 448 feet
- The median depth is 400 feet (half are deeper and half are shallower)



# Well Yield of non-exempt wells in Butte

- 37 out of 43 non-exempt wells provided pump test data from 1989-2024
- The average yield is 1355 gpm
- The median yield is 1387 gpm (half are less and half are more)



# 138 hypothetical wells

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- 23 combinations of well construction
- 6 preliminary locations in and around Butte Valley

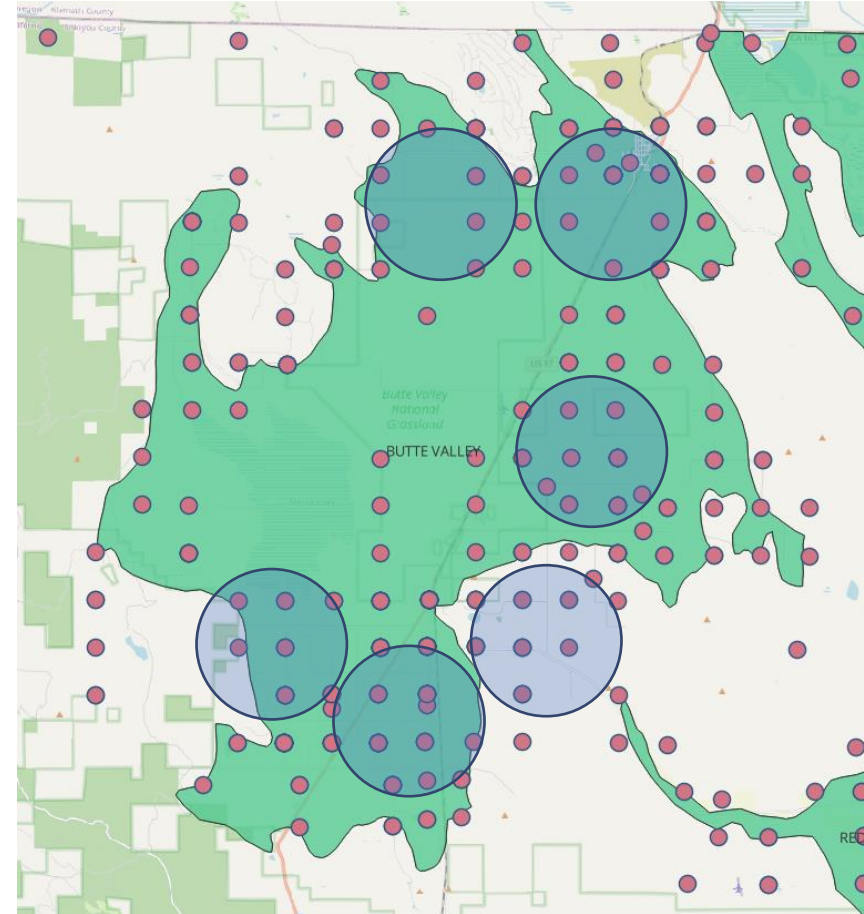
## PUMPING SCENARIOS:

- A **variety** of pumping scenarios considered (**depth, rate**):
  - Depth: 200, 400, 600, 800, 1200 ft
  - Capacity: 600, 800, 1200, 1600, 2000, 2500, and 3000 gpm
- **Predictions** were made by placing a **hypothetical** well within the Butte Valley Basin
- Observing drawdown as **predicted** by the **model**



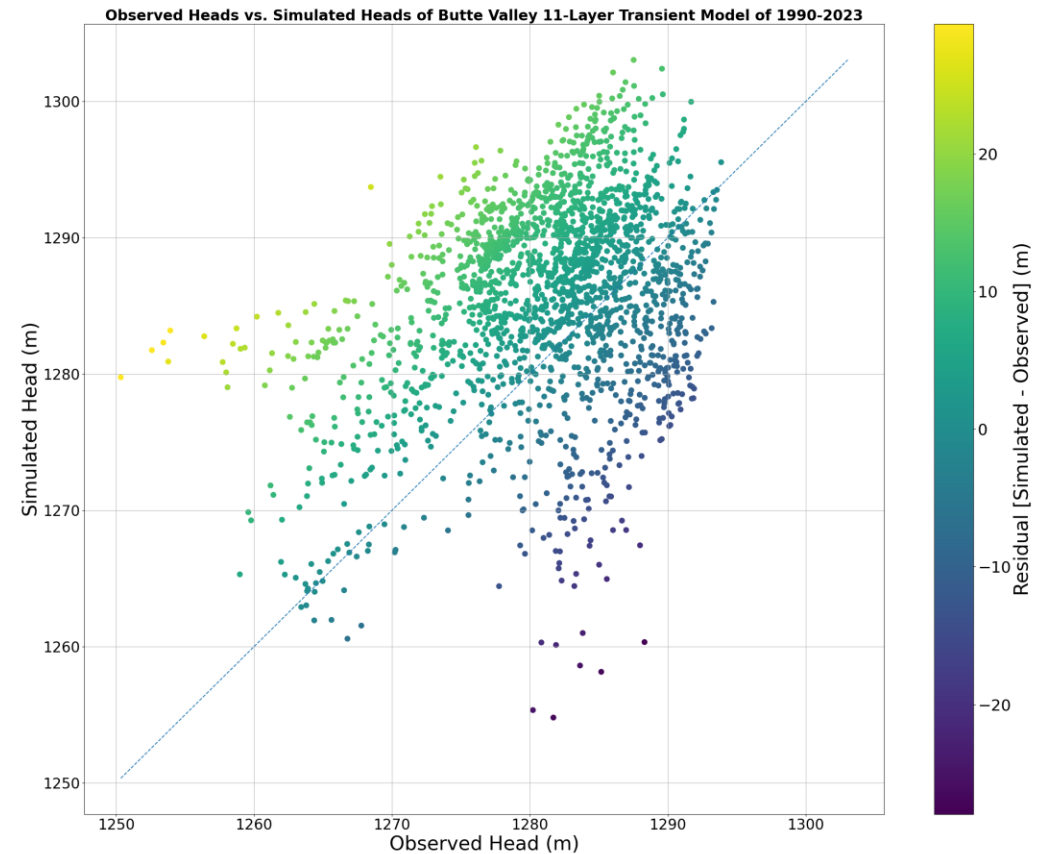
# Approximate Well Locations

- Approximate locations of non-domestic well in the Butte Valley area.
- Circled area are where hypothetical pump tests are being calculated
- The Executive Order allows setting limits on wells both inside and outside the SGMA basin



# Limitations

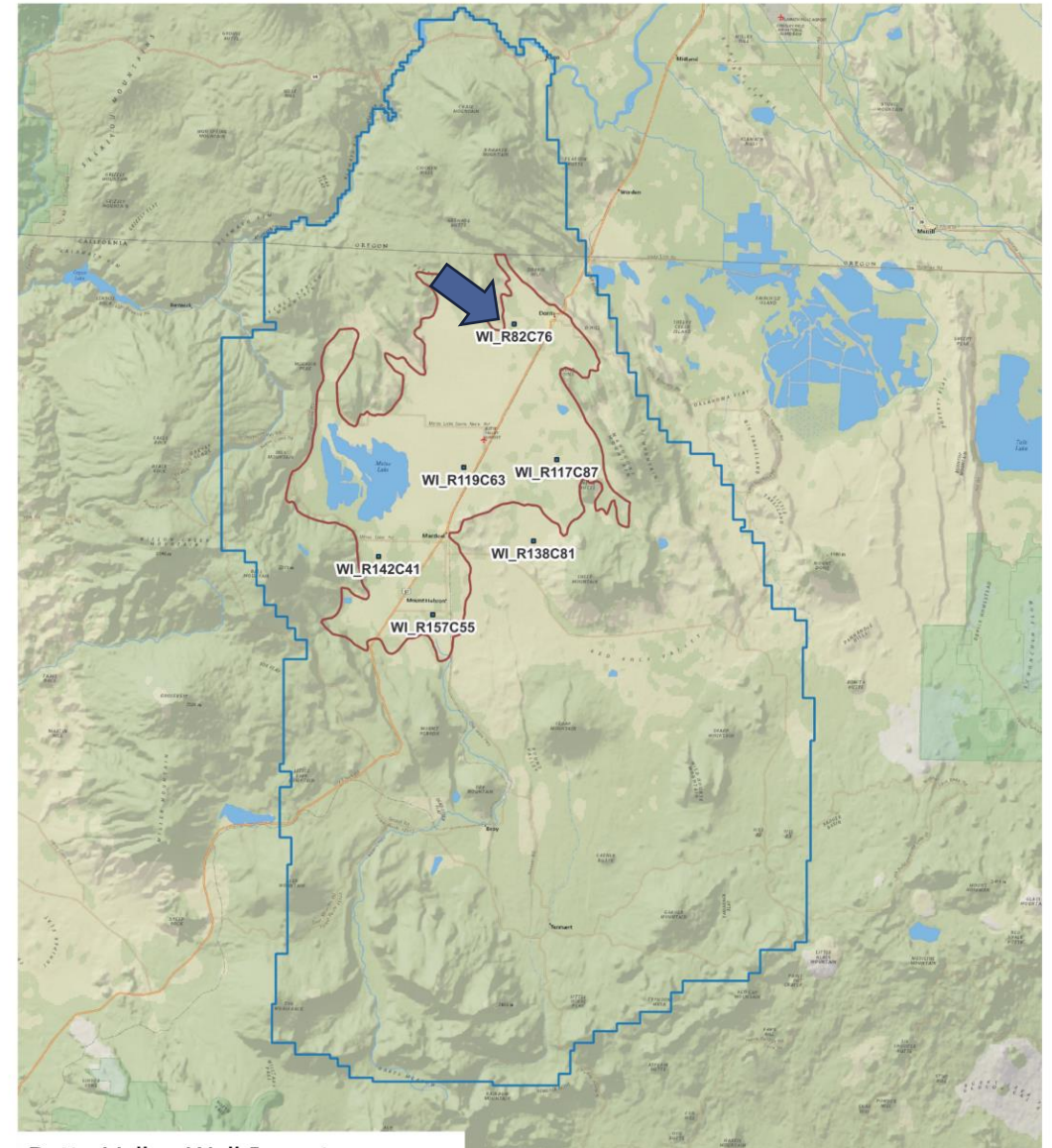
- The model has **generally good** correlation between observed and predicted groundwater levels
- Does **not bias significantly** to over or under prediction
  - Not over or under estimating
- **Still needs further calibration**





# ZONE 1: North Well

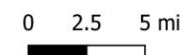
- Pumping starts in April
- Results are presented for August

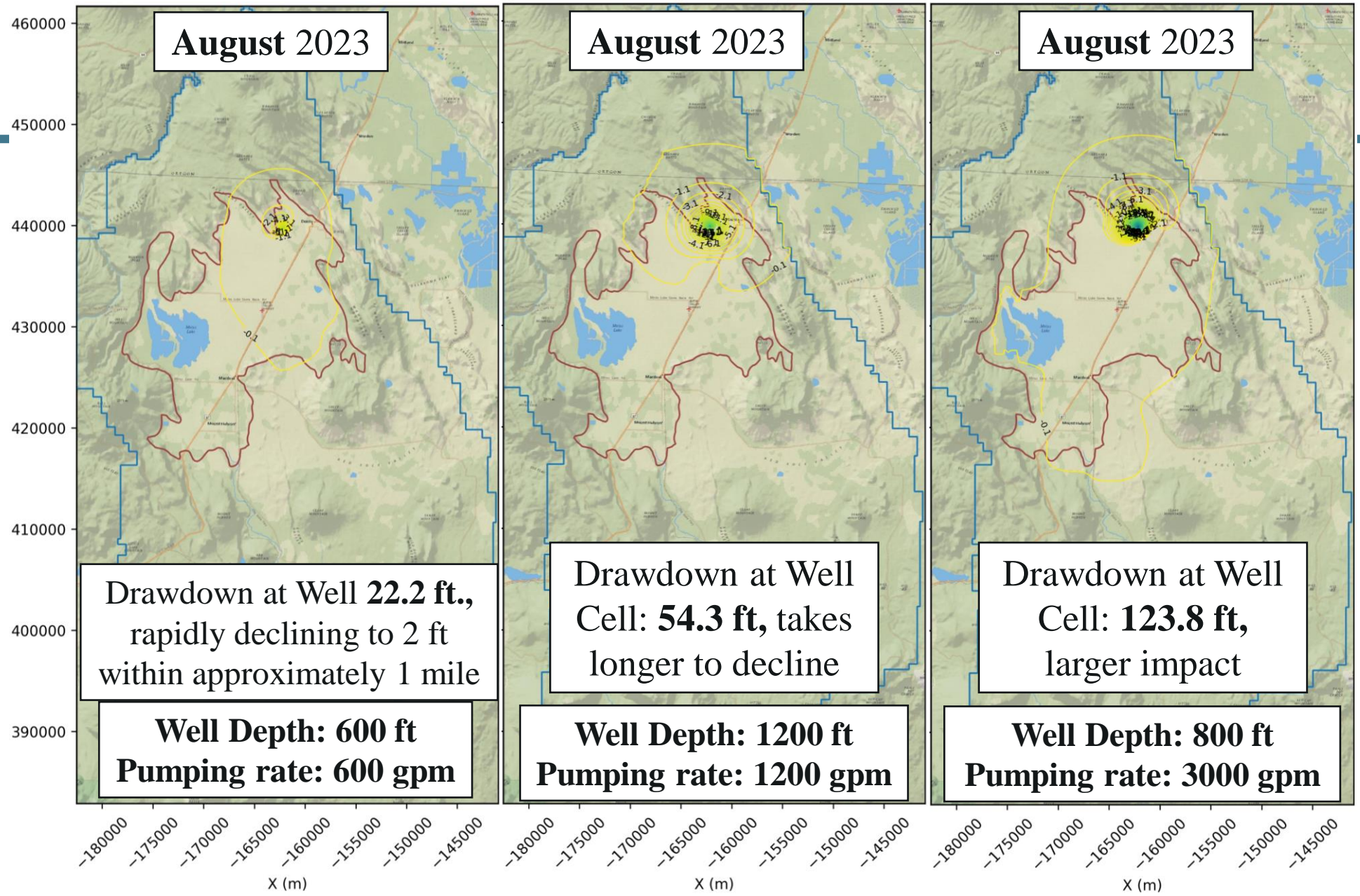


Butte Valley Well Inventory

- Butte Valley Active Grid Boundary
- Butte Valley Basin (Bullet-118) Boundary
- Butte Valley Well Inventory

ESRI National Geographic





August 2023

August 2023

August 2023

Drawdown at Well **22.2 ft.**,  
rapidly declining to 2 ft  
within approximately 1 mile

Drawdown at Well  
Cell: **54.3 ft**, takes  
longer to decline

Drawdown at Well  
Cell: **123.8 ft**,  
larger impact

**Well Depth: 600 ft**  
**Pumping rate: 600 gpm**

**Well Depth: 1200 ft**  
**Pumping rate: 1200 gpm**

**Well Depth: 800 ft**  
**Pumping rate: 3000 gpm**

X (m)

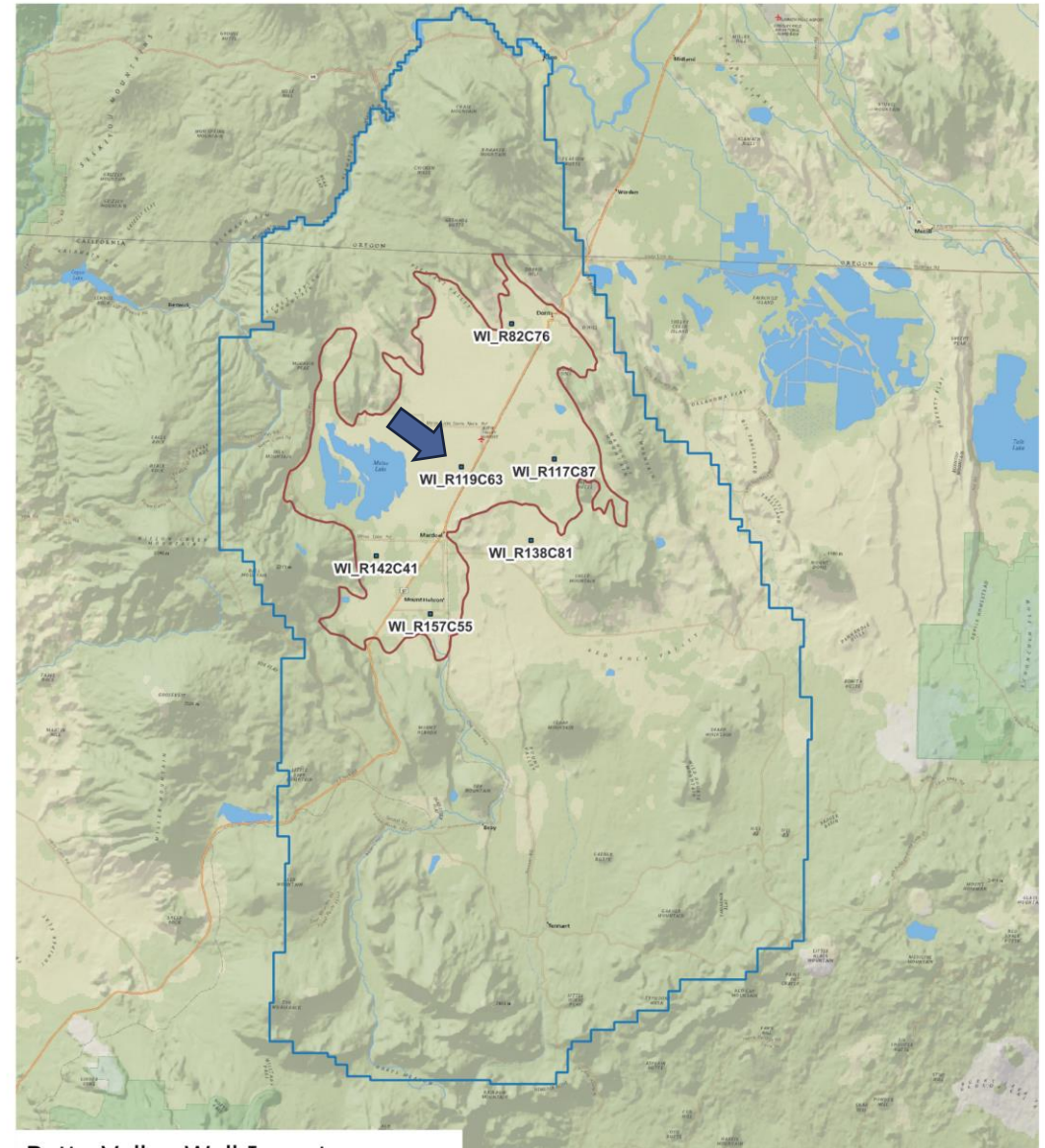
X (m)

X (m)



# ZONE 2: Central Well

- Pumping starts in April
- Results are presented for August



Butte Valley Well Inventory

- Butte Valley Active Grid Boundary
- Butte Valley Basin (Bullet-118) Boundary
- Butte Valley Well Inventory

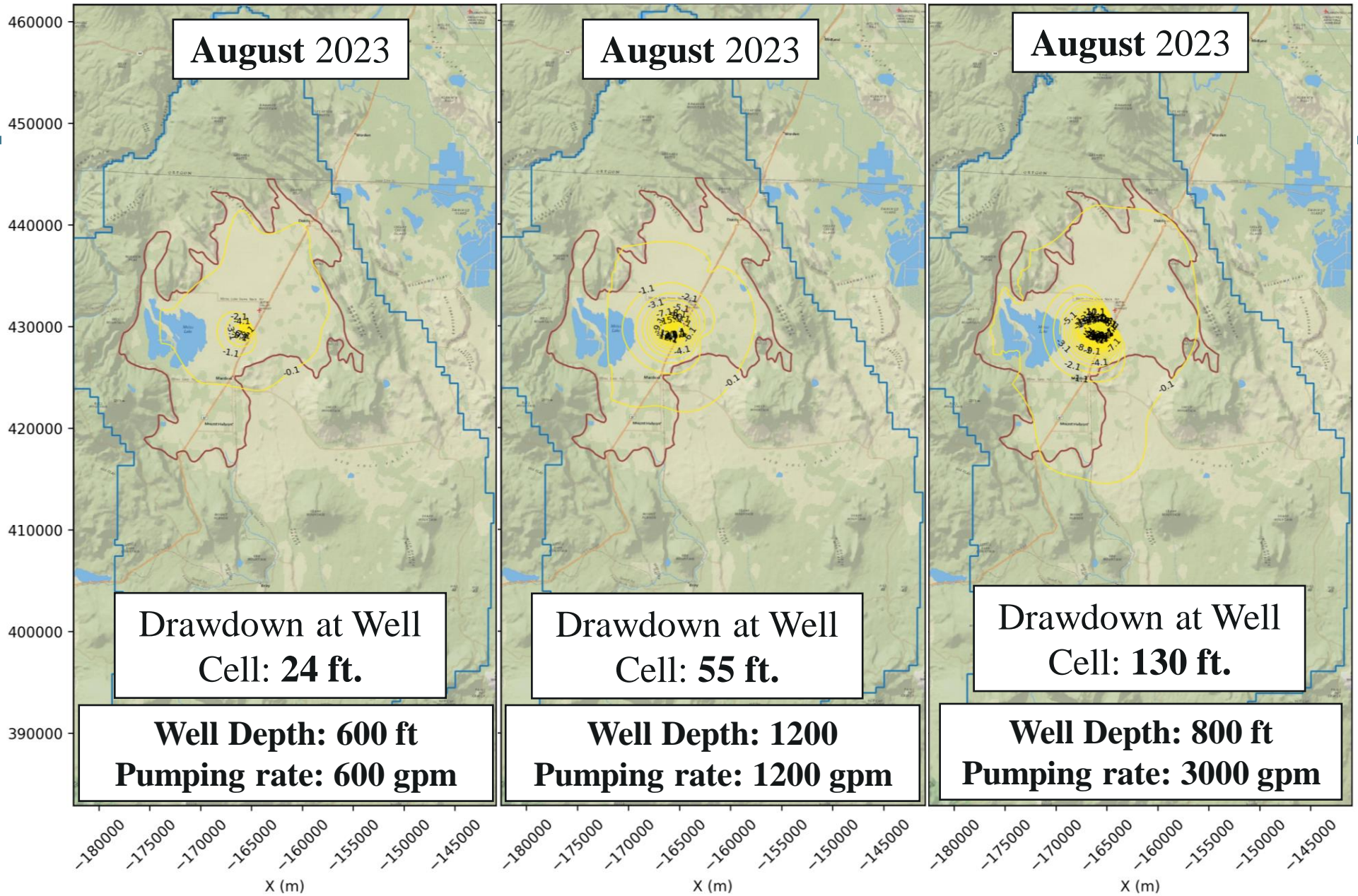
ESRI National Geographic

0 5 10 km



0 2.5 5 mi

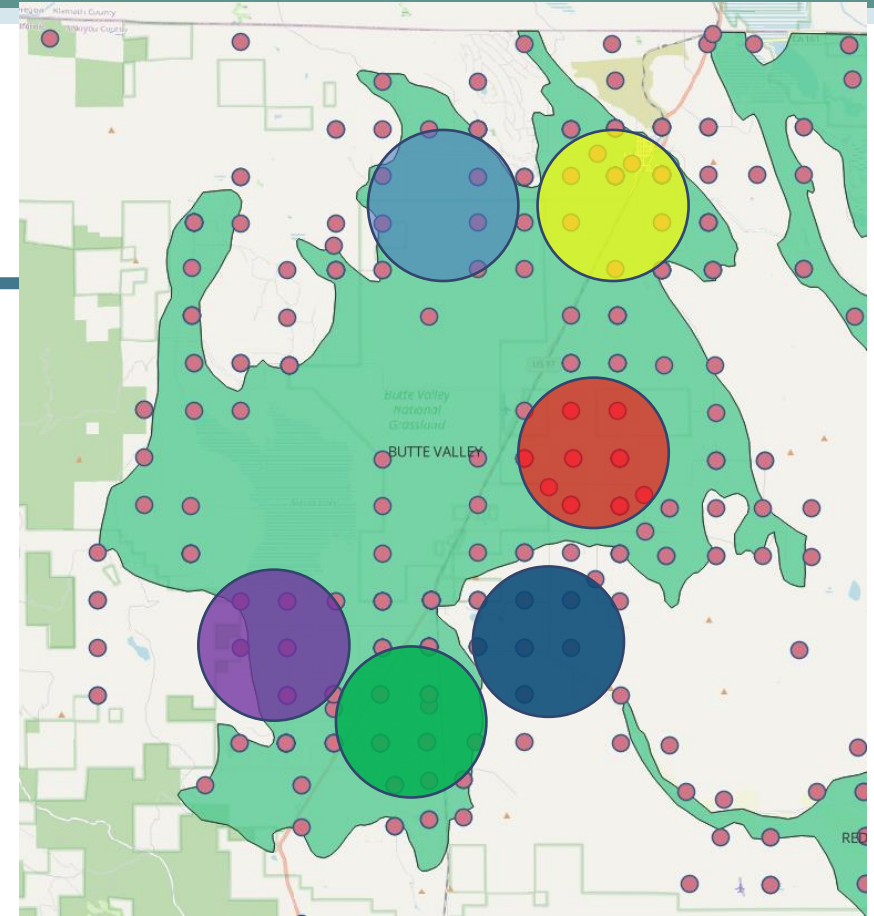






# Summary and next steps

- Once all the scenarios are finalized: what is the accepted drawdown? Are there other wells nearby?
- For each zone, develop summary table:



ZONE	Depth (ft)	Capacity (gpm)	Expected drawdown (ft)	Expected radius of influence (ft)	Are there other wells nearby?	Can it be permitted or needs more analysis?
1	800	3000	10	1000	Yes	Needs more analysis



**Thank You**