Freeway Well Planning Project

Feasibility Study

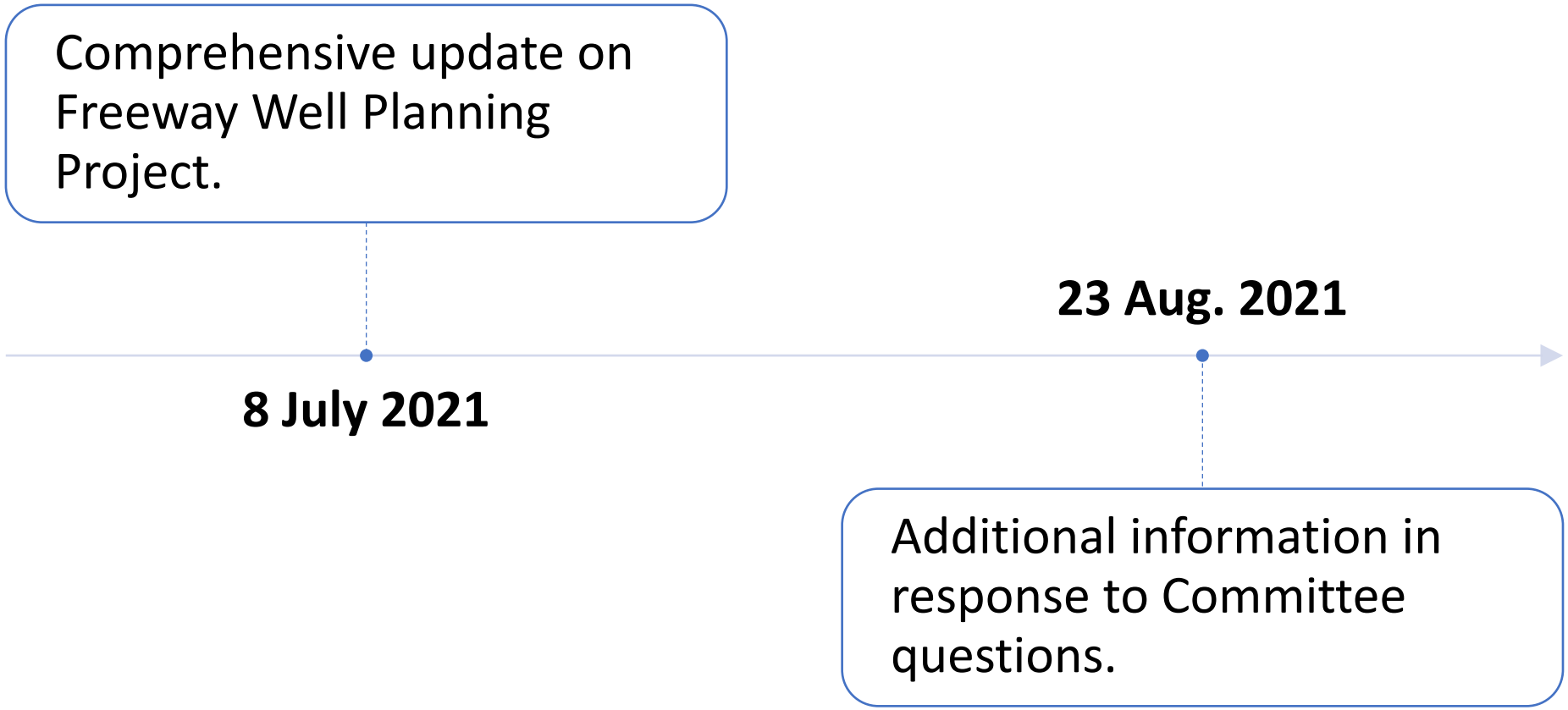
September 2, 2021

Board of Public Utilities

Colin Close, Senior Water Resources Planner

Jim Connell, West Yost

Groundwater Ad Hoc Committee

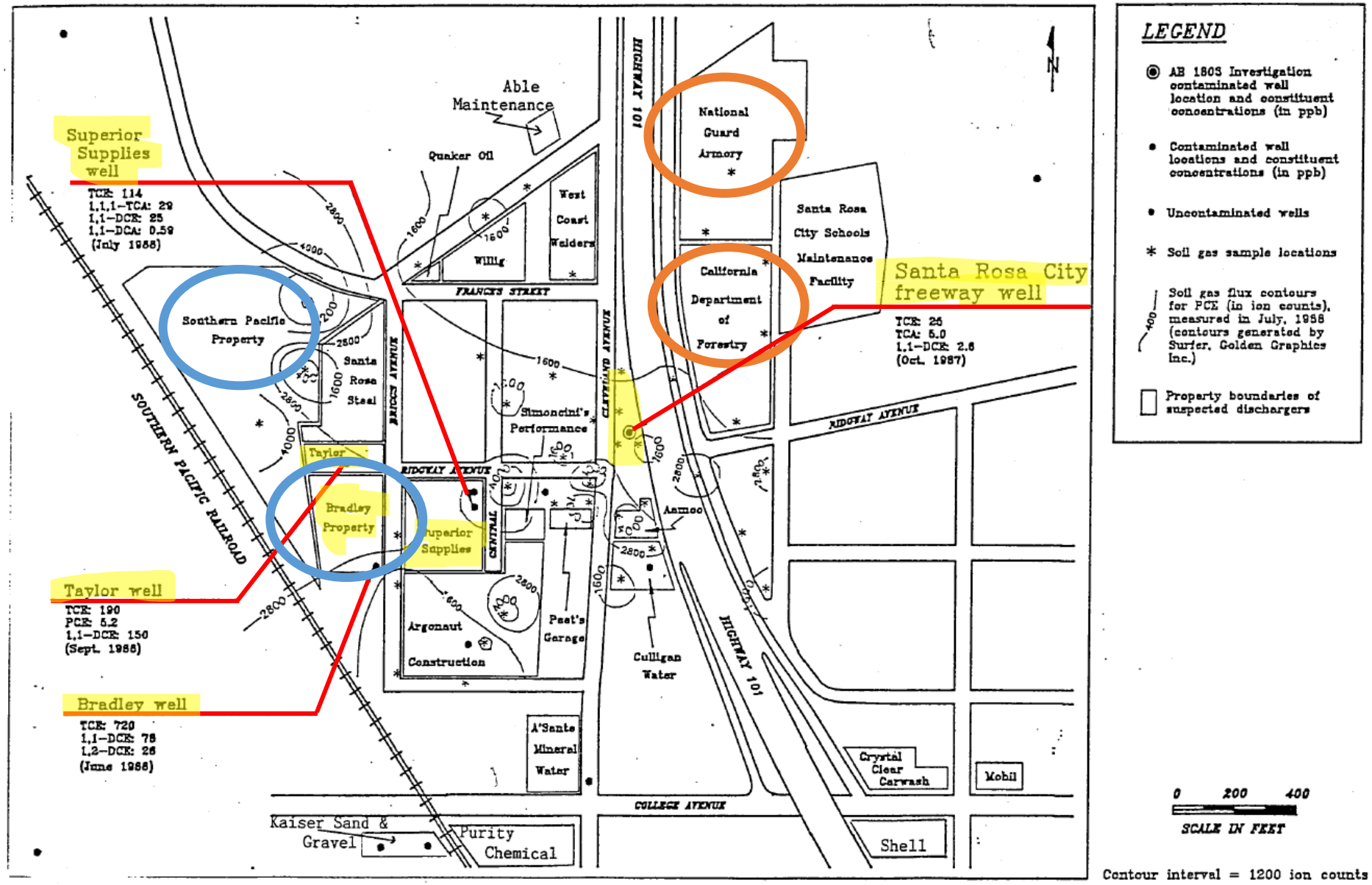


Freeway Well

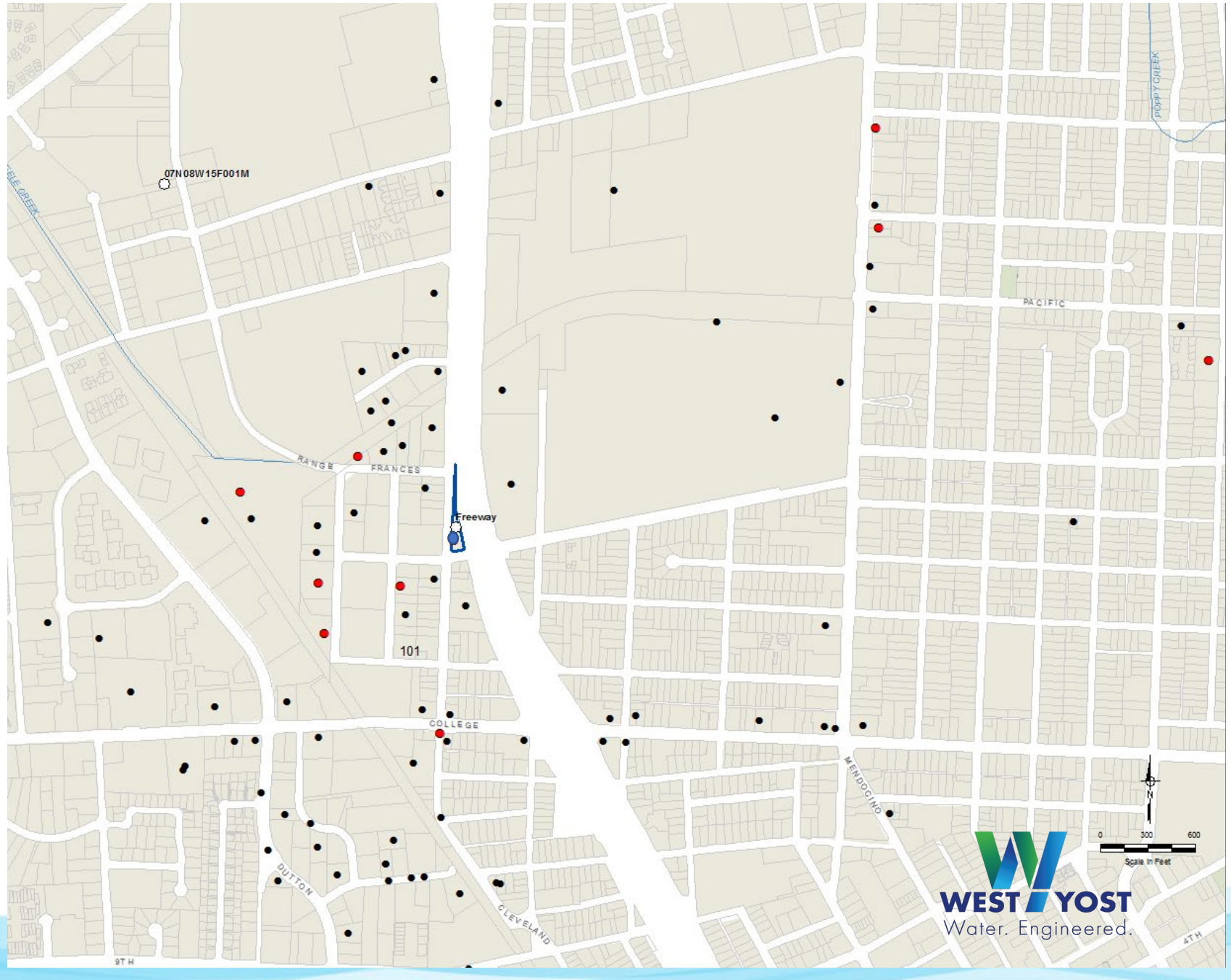
1304 Cleveland Avenue

- Built in 1957
- 817 feet deep, 16” diameter
- Productive (~ 1 mgd)
- Volatile organic compounds (VOCs) discovered in 1987

SANTA ROSA CITY FREEWAY WELL SURVEY AREA, WELL INVESTIGATION PROGRAM, NORTH COAST REGIONAL WATER QUALITY CONTROL BOARD



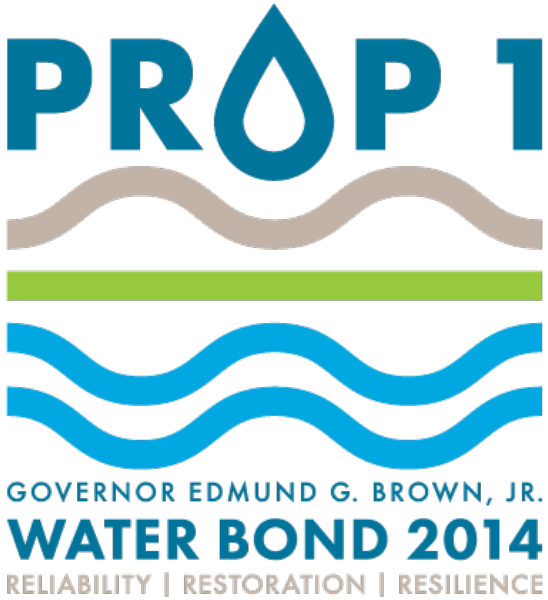
Status of State investigations as of 2016



Symbology

- Reported Toxic Release; Case Closed
- Reported Toxic Release; Case Open
- Water Level Monitoring Well
- Public Supply Wells
- Creek
- Freeway Well Site
- Parcel

Proposition 1 Groundwater Grant Program



- For projects that prevent and/or cleanup contamination of groundwater that serves, or has served, as a source of drinking water.
- Competitive process and 50% local match required.
- State invited City to submit pre-application and then final application.
- City's application was approved for funding.
- Project timeline: Sept 2018 - Mar 2021.

Budget - $977,866 (50% match*)

Line Items	State Grant	City Match*	Total
Direct Project Admin Costs	$ -	$ 53,216	$ 53,216
Planning / Design / Engineering / Env'l	$ 222,424	$ 51,389	$ 73,813
Construction / Implementation	$ 252,966	$ 380,144	$ 633,110
Education / Outreach	$ 13,446	$ 4,281	$ 17,727
TOTALS	$ 488,836	$ 489,030	$ 977,866

* In-kind & cash

Technical Advisory Committee

Santa Rosa Water

- Water Resources
- Local Operations
- Water Quality
- CIP Engineering
- West Yost

State

- State Water Board
- Regional Water Board

Opportunities for Public Participation

- Presentations at BPU
- Presentations at Council
- Outreach to well owners within 2000’
- Notices to parcels within 500’
- Stakeholder Advisory Group
- Webpage www.srcity.org/FreewayWell

Remedial Investigation

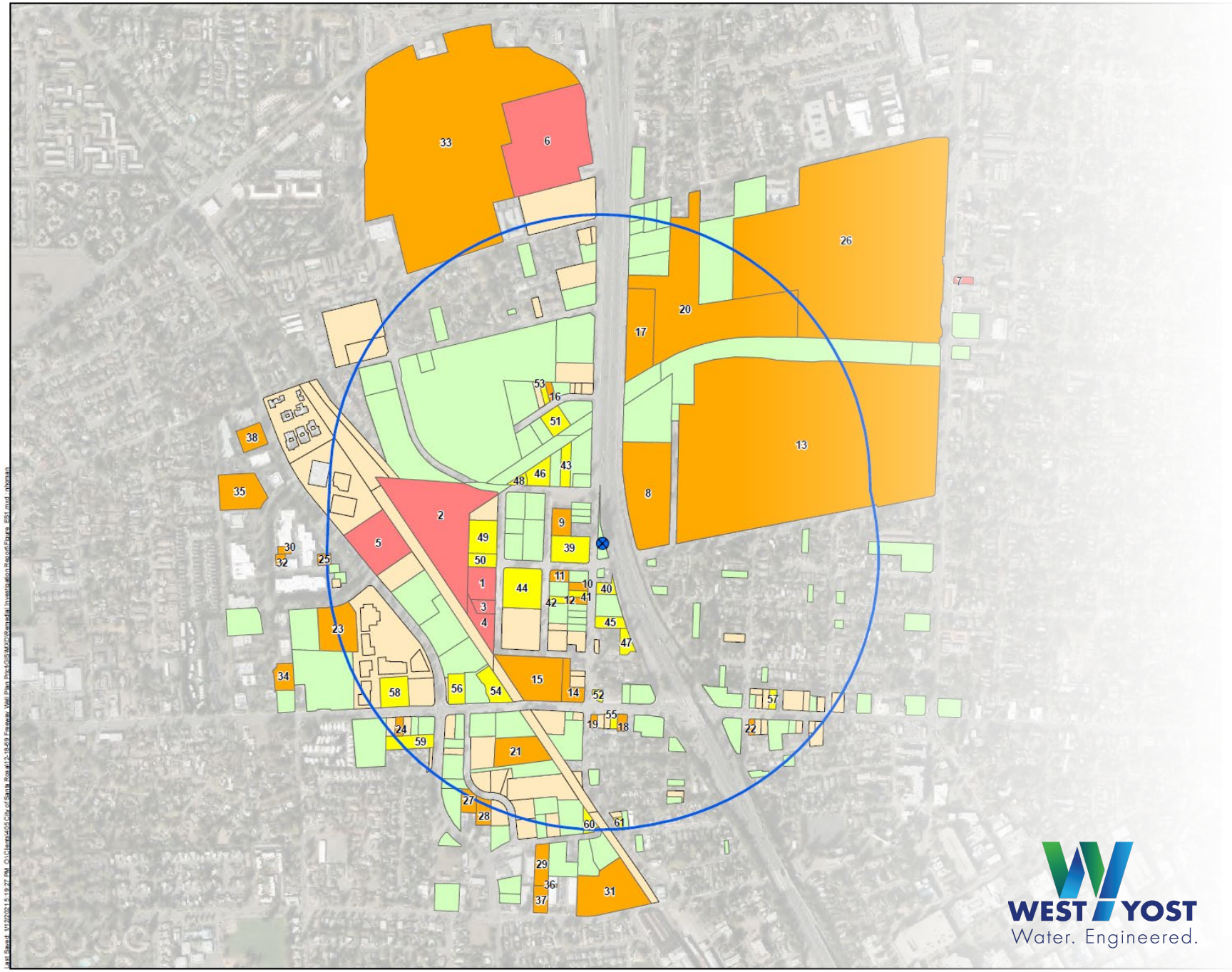
Site Assessment

- Conduct thorough records review.
- Gather and analyze all available data.
- Interview sites with potential history of VOC use.

Site Characterization

- Drill test boring and install monitoring well complex.
- Monitor private observation wells within 2000 feet.
- Perform aquifer pump testing.
- Analyze water quality at various depths.

Risk Ranking



Symbology

- Freeway Well
- 2,000 ft Radius from Freeway Well

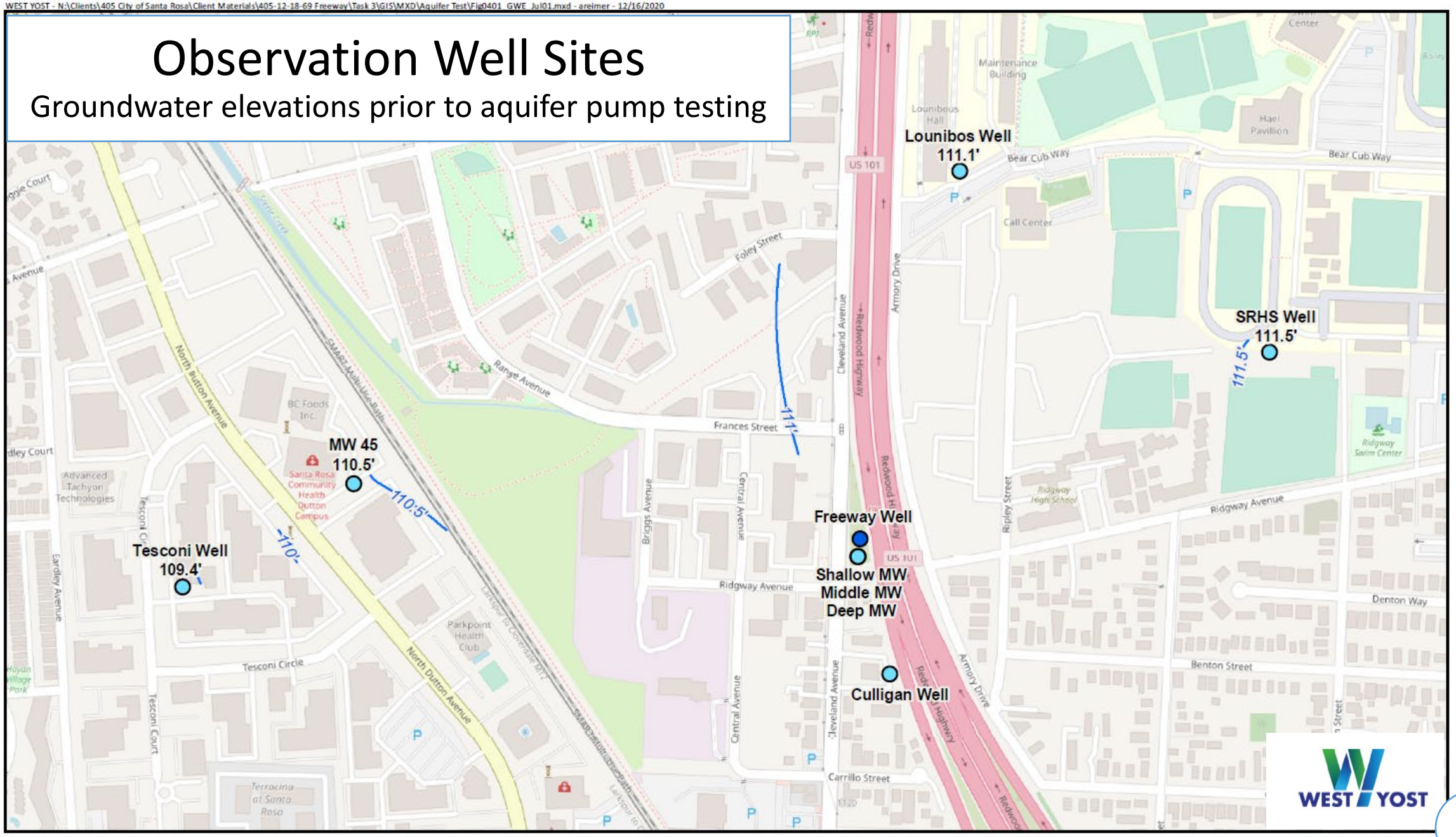
Risk Rating

- Very High - Known Spills of TCE, PCE, or Other Solvents
- High - Known Storage of TCE, PCE, or Other Solvents
- Medium - Potential Usage of Solvents based on Site History
- Low - No Indication of Solvent Use
- Data Gap - Commercial or Industrial Land Use with No Available Records

WEST YOST
Water. Engineered.

Observation Well Sites

Groundwater elevations prior to aquifer pump testing



Drilling Jan-Feb 2020

Boring

- 800 ft bgs
- 8” diameter

Completed

- ✓ 520 ft bgs
- ✓ 14” diameter

Monitoring wells

1. 150-160 ft bgs
2. 288-298 ft bgs
3. 508-518 ft bgs

Pump testing delayed

Scheduled for March 2020.

- Mar-Aug 2020 – Shelter in Place public health orders stopped field work.
- Aug 2020 – LNU/Lightening Complex Fire/Walbridge Fire
  - Evacuations = no lodging available for pump test contractor.
- Pump testing and water quality sampling completed in Sept 2020, prior to start of Glass Fire.

Requested grant timeline extension (9 months). Approved by State.

Aquifer Pump Testing – Sept 2020

52.7 hours after Start of Constant Rate Test

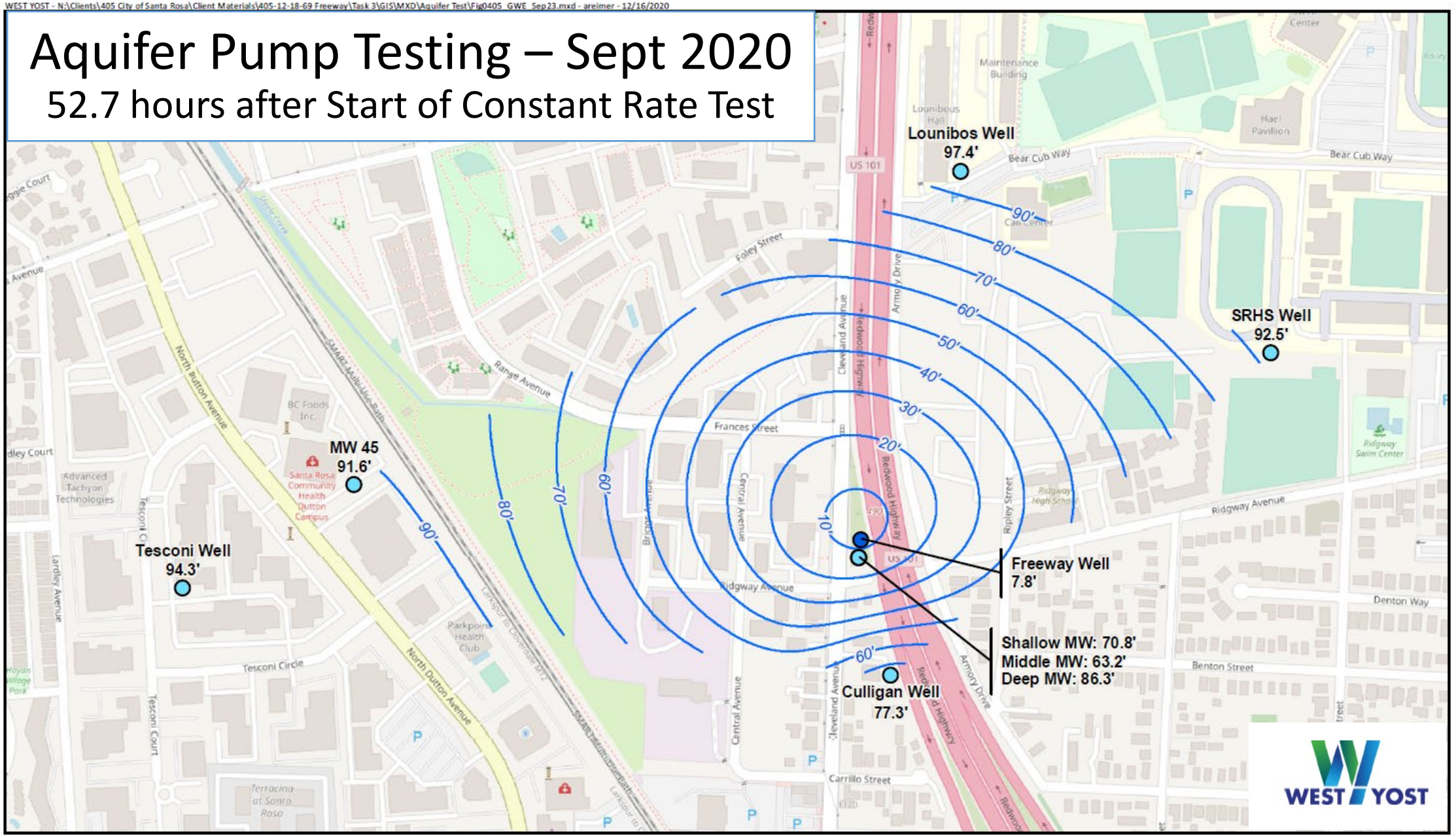
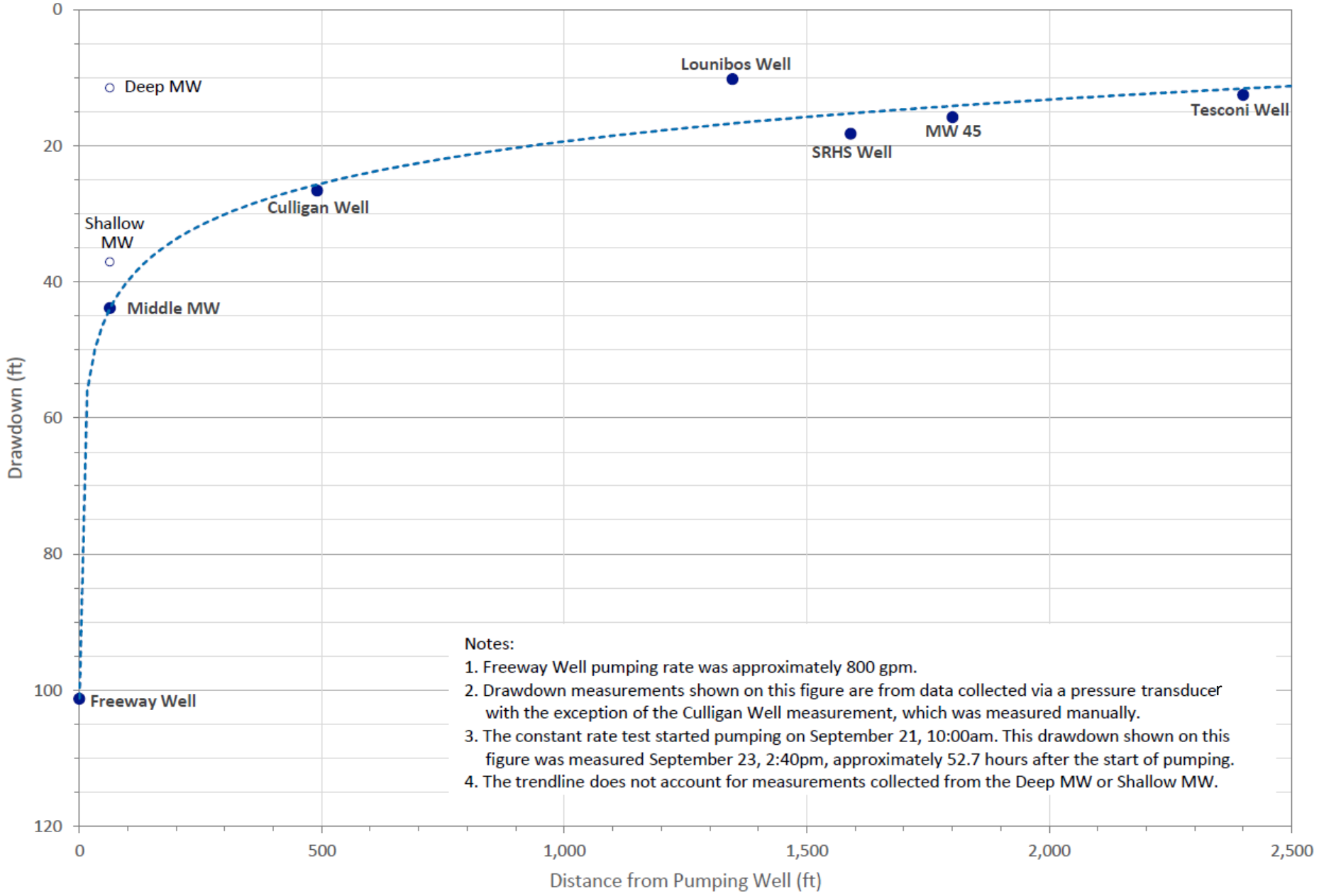


Figure 4-6. Drawdown with Distance from the Freeway Well



Water Quality Sampling

VOCs detected in Freeway Well and each of the onsite monitoring wells. Concentrations highest in Freeway Well.

TCE exceeded MCL in Freeway Well and Shallow and Middle monitoring wells.

The types of VOCs detected in Shallow and Middle monitoring wells included those detected in Freeway Well, plus additional VOCs.

Manganese detected at 620 µ/L (secondary limit: 50).

Remedial Investigation - Findings

No new releases or responsible parties discovered during research.

Freeway Well remains contaminated and is almost certainly a conduit for cross-contamination.

Modifying Freeway Well to block contaminated aquifer zones not considered feasible.

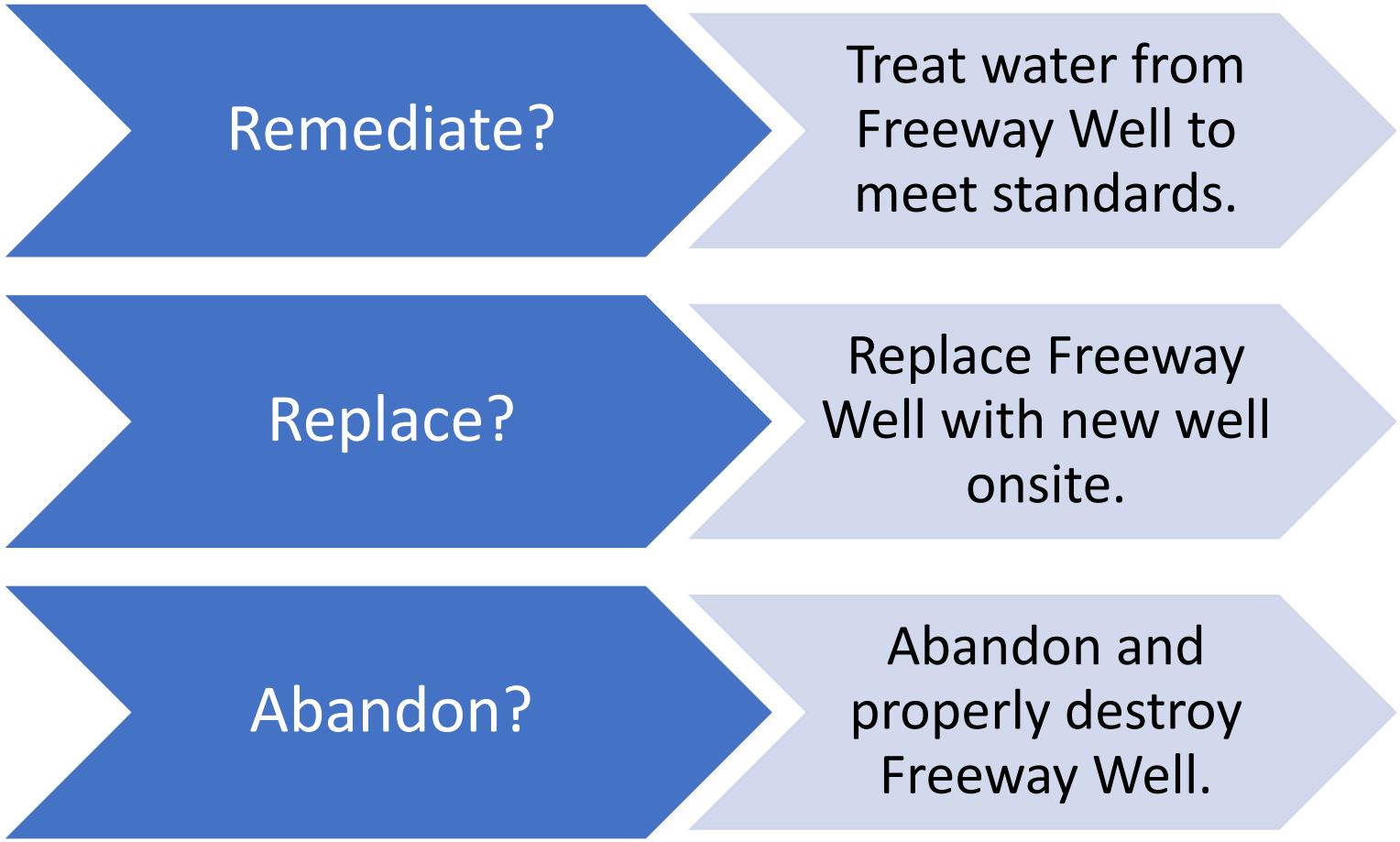
A new well screened only in lower aquifer expected to have lower concentrations of VOCs but would be less productive.

Remedial Investigation - Recommendations

Properly abandon Freeway Well.

Conduct feasibility study to assess alternatives for protecting and/or remediating groundwater.

Feasibility Study



Remediate?

MANGANESE

- Reduce manganese to meet secondary standard drinking water standard.
- Filtration using a manganese oxide-coated media.
- Upstream of VOC treatment.

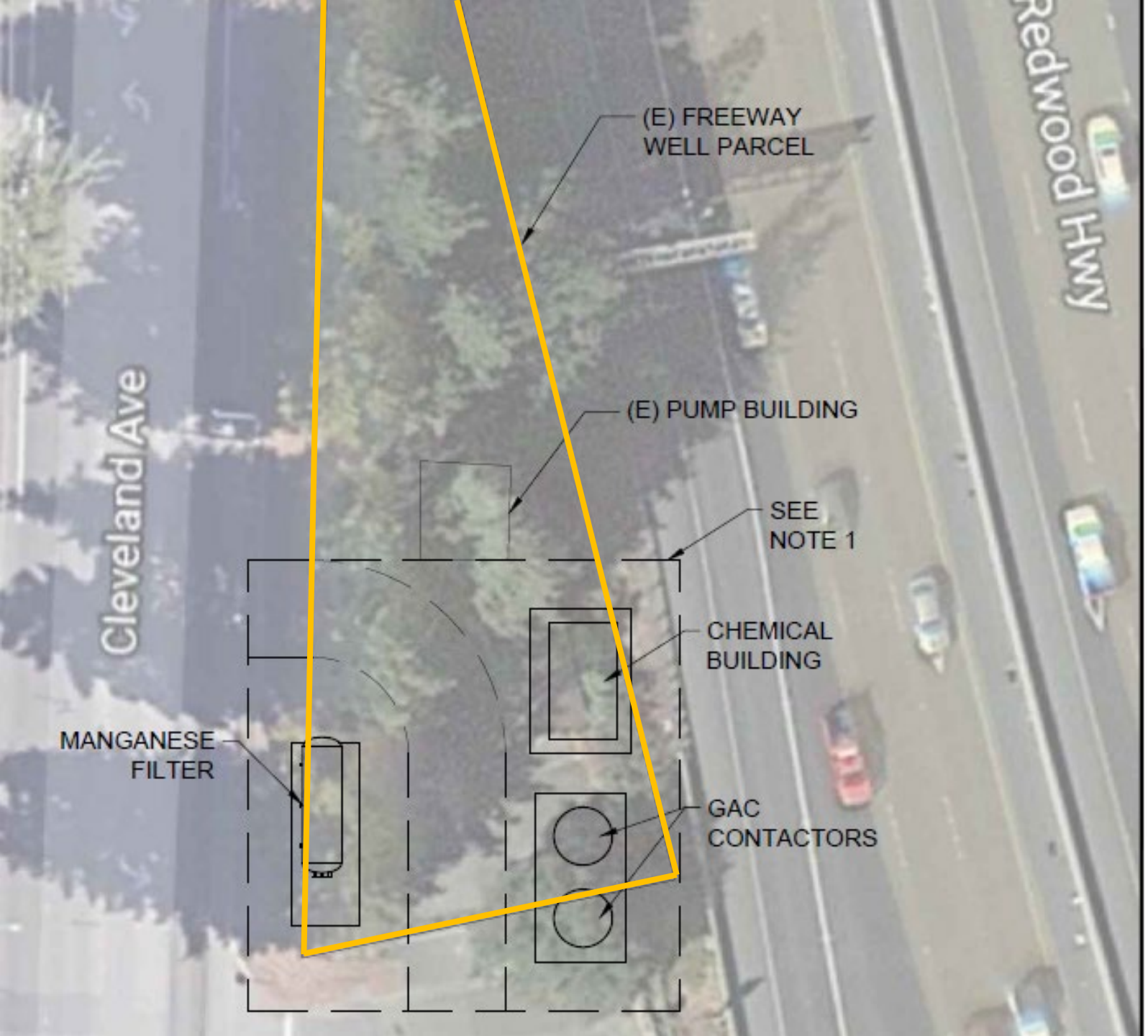
Remediate?

OPTIONS FOR REMOVING VOCs

- Packed Tower Air Stripping
- Granular Activated Carbon

Packed Tower Air Stripping Site Layout

- Air quality emission limits may trigger permitting.
- Not cost effective compared to new well at clean site.
- Footprint would exceed available space



Granular Activated Carbon Site Layout

- Not cost effective compared to new well at clean site.
- Footprint would exceed available space.

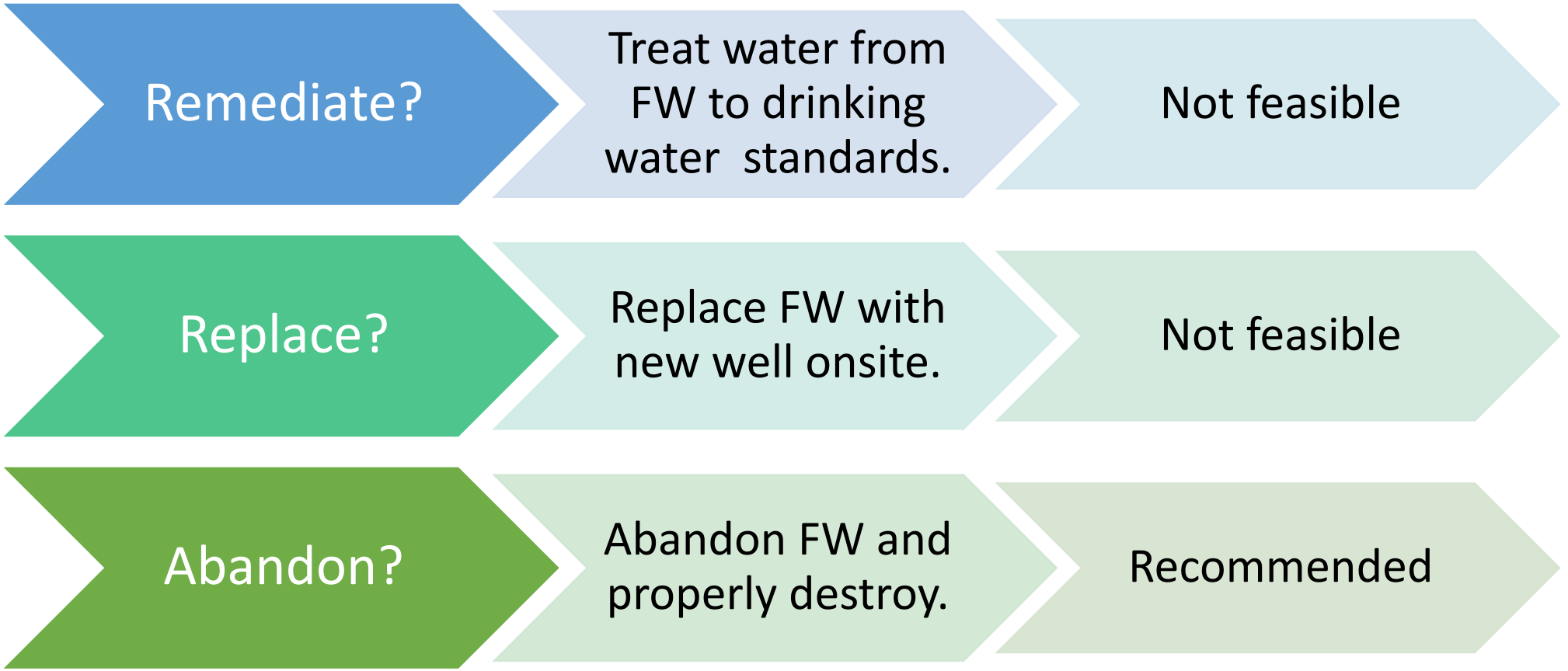
Replace with new well on site?

Purpose	Approach	Assessment
• Install new well onsite to replace FW.	• Install screens only in lower aquifer.	• Yield uncertain. • Water quality issues (VOCs). • Much more expensive than new well at clean site.

Abandon Freeway Well?

Purpose	Approach	Assessment
• Eliminate conduit between aquifer zones.	• Blast perforate the blank casing and fill with sand cement slurry.	• Would help protect groundwater resources.

Feasibility Study Conclusions



State comments on draft Feasibility Study Report

Report is logical, straightforward, and well done.

Satisfied with quality of study, data, and findings.

Minor changes requested:

- Table 1-1 – Correct typo (section numbers).
- Section 2.2 – Add info about lateral extent of known plume.
- Section 2.3 - Add discussion regarding behavior of contaminants.

Recommendation

It is recommended by Santa Rosa Water that the BPU, by motion, accept the Freeway Well Planning Project Feasibility Study report.

Questions?