



**Department of Toxic Substances Control**

# **Groundwater Education Foundation**

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# Welcome!

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# Agenda

- History and Overview of Site
- Expansion of Remediation System
- Upgrades to GWTP
- Source Area Remediation
- Update of Groundwater Numerical Model
- Aquifer Restoration and Recharge Project

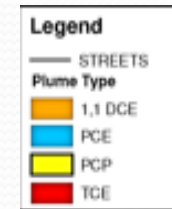
# Chico Central Plume Groundwater Project



# Site History

- 1984 - PCE was first detected in municipal wells.
- 1985 - Two of the impacted wells were removed from service, and formally abandoned by 1990.
- 1986 - DTSC began its investigations of the PCE.
- 1988 - DTSC began installation and sampling of MWs.
- 1989 – Soil Gas Investigations conducted for sources.
- 1990 – I/SE Orders issued for (Flair/Esplanade).
- 1990's – Investigations funded by RPs show sewer lines in disrepair, caused releases to shallow soil and GW.
- 1995 – IRM installs two extraction wells (S-1 & S-2).
- 1997 – IRM EWs go online sending water to GETS.

# Chico Plumes

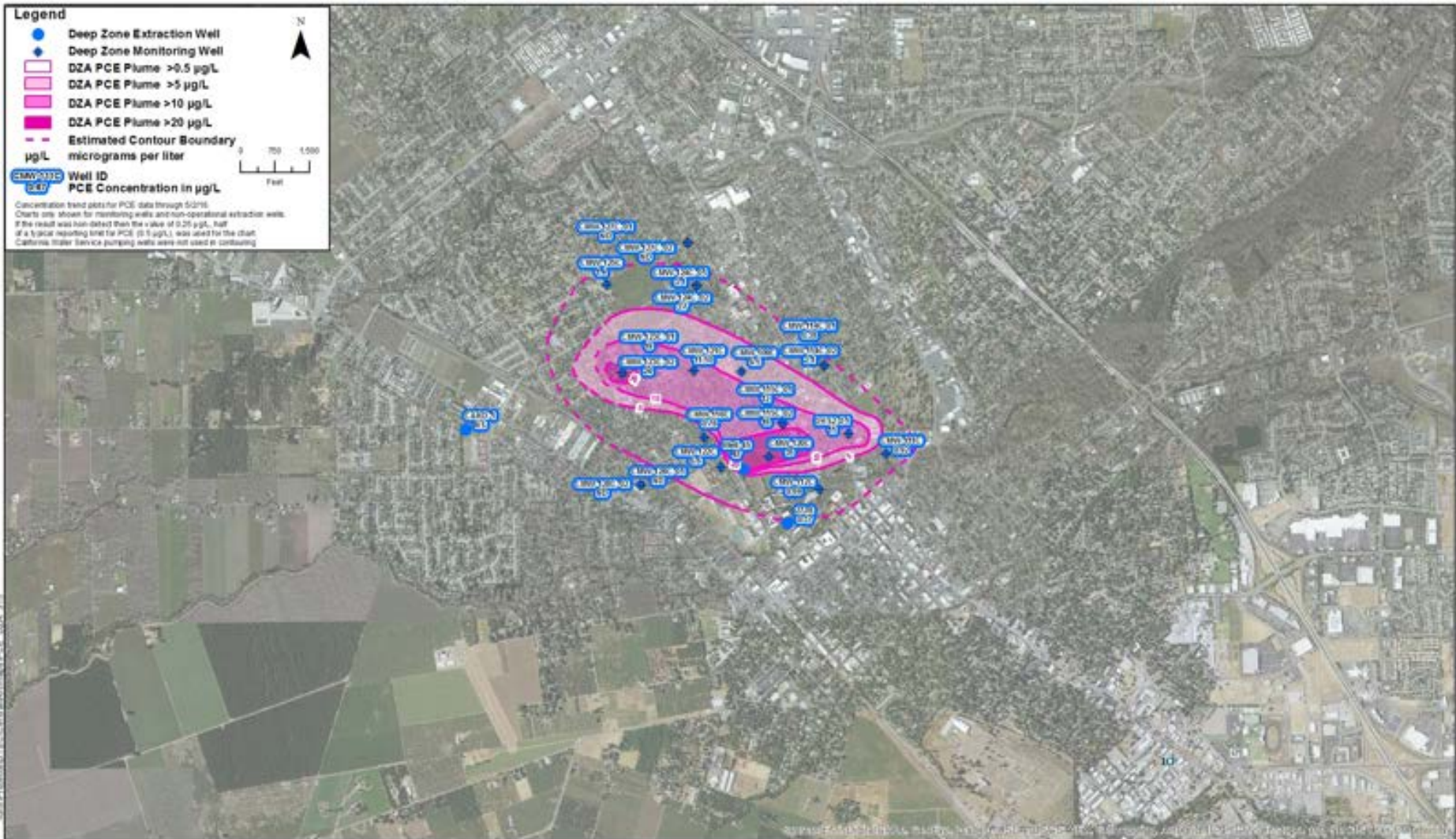








# Deep Zone Aquifer



## Historical PCE Concentrations in DZA Wells

Central Plume Intermediate and Deep Zone Aquifers Semiannual Groundwater Monitoring Event-April 2016  
Chico, California

# Recent Remedial Activities

- Upgraded GETS to handle extra capacity (<800gpm).
- Conducted tank assessment for long term operation.
- Installation of SCADA system controls.
- Expansion of EW network to four (4) EWs. – Jan. 2014
- Source Area Remediation - KMnO<sub>4</sub> Injections – July & October 2014.
- Hydraulic studies for plume influences.
- Calibration of GW Flow and Fate & Transport Numerical Models.



# Groundwater Treatment Plant



# Pre-filtration Units



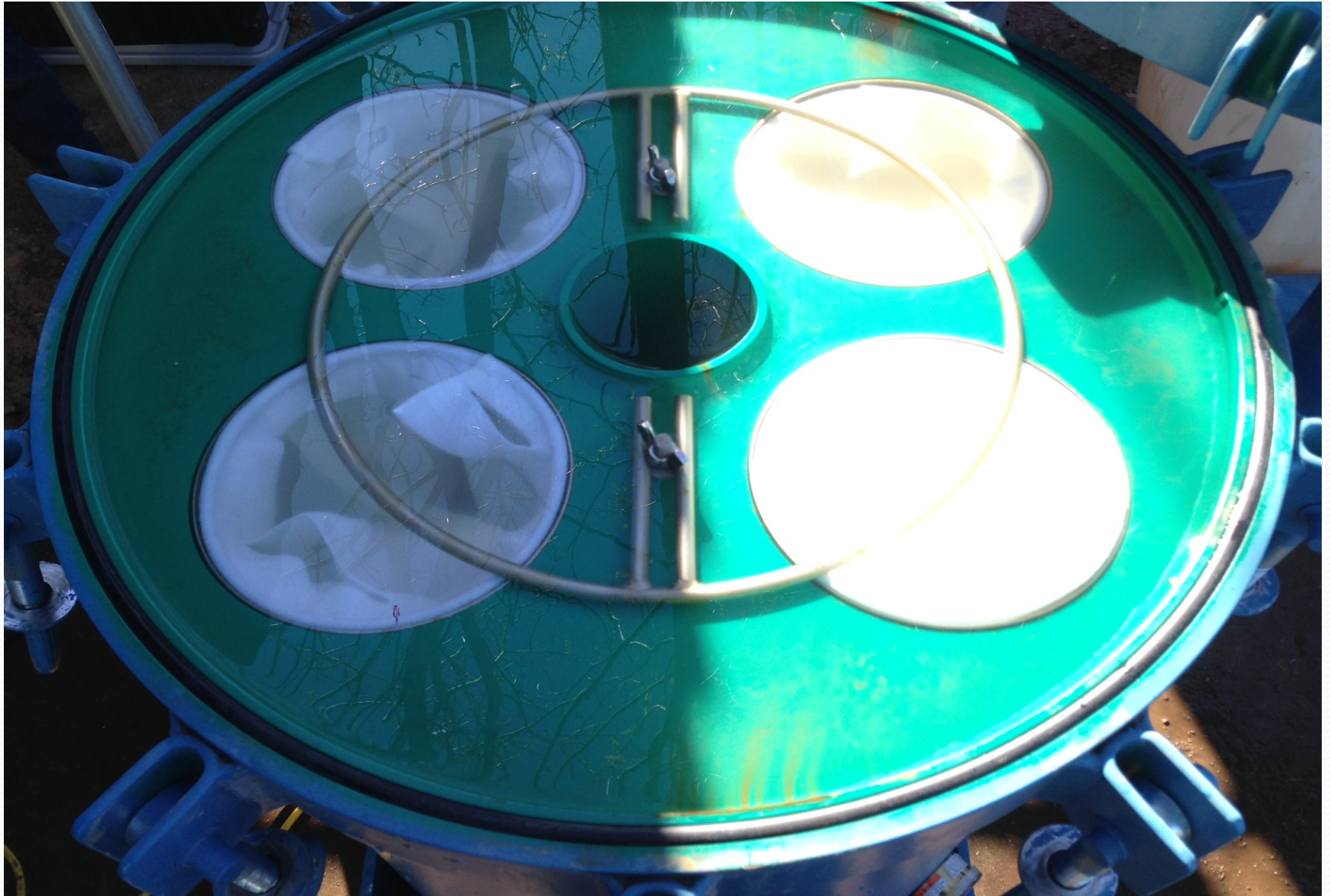
# Groundwater Treatment Plant Upgrades



# Filter Baskets- Old



New





# New Manifold Assembly



# Post Upgrades



# Effluent Line Assembly with Bypass and Chlorine



# After Painting



# New Entrance and Chlorine Shed Foundation



# Chlorine Tank



# Chlorine Shed

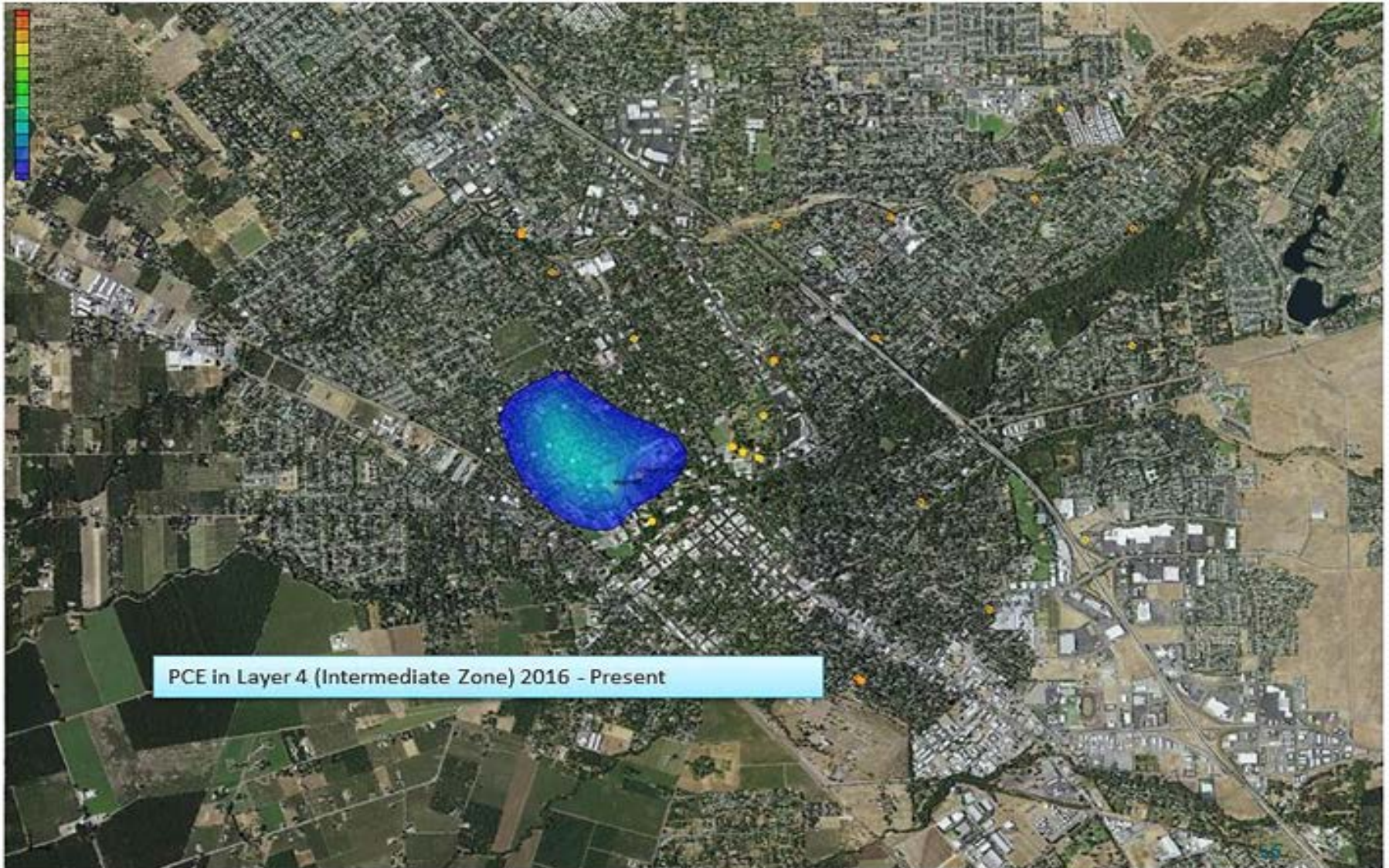


# Update to Groundwater Model

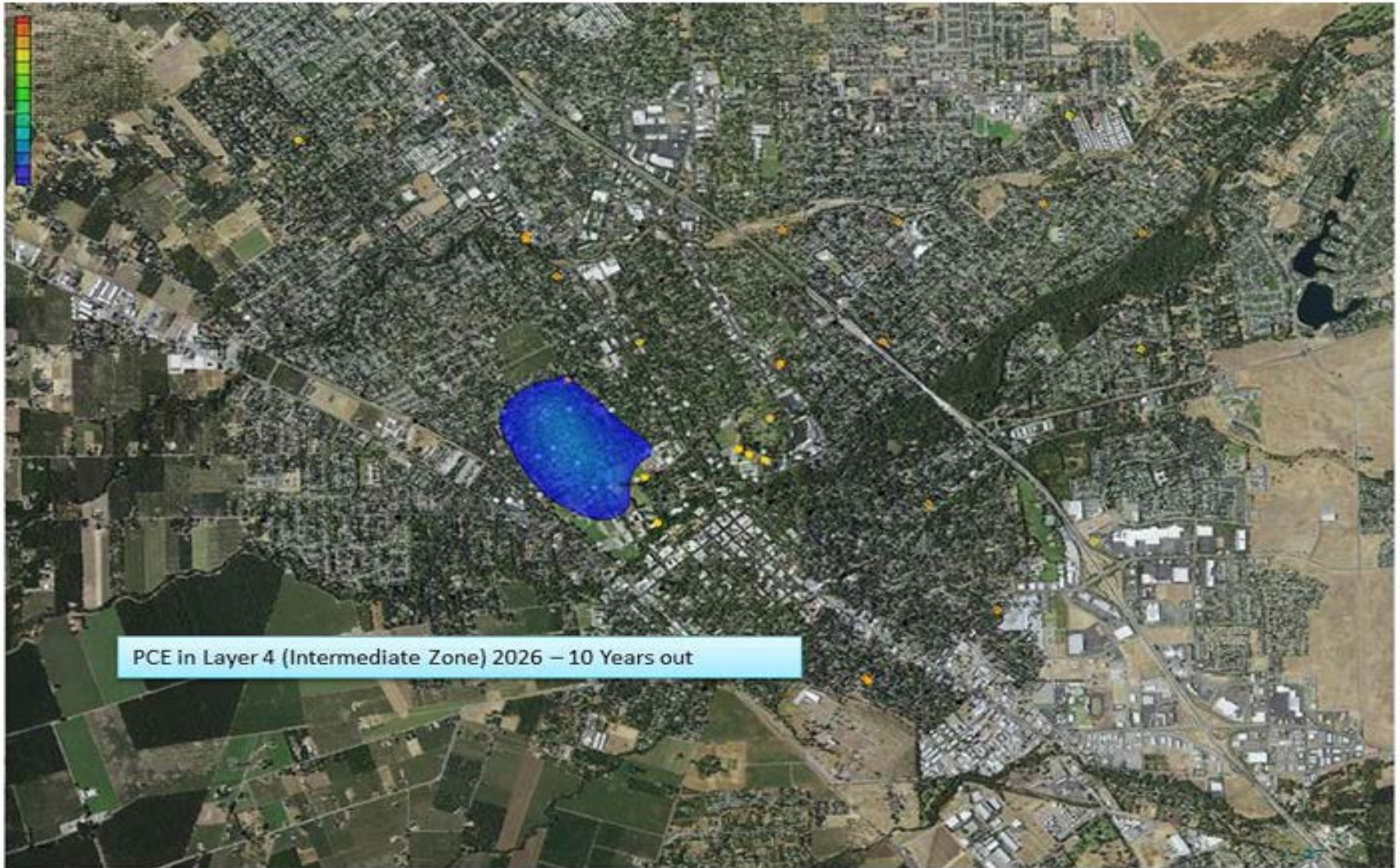
- Groundwater Model was originally created in 2005 to support litigation.
- Original model was overly simplistic and treated layers as homogeneous and uniform thickness with no flow aquitards.
- 2015 model used additional layers and based hydraulic conductivity values on site specific data.
- Removed IZA/DZA Aquidard based on updated lithology.
- Simulations show better agreement with observations.



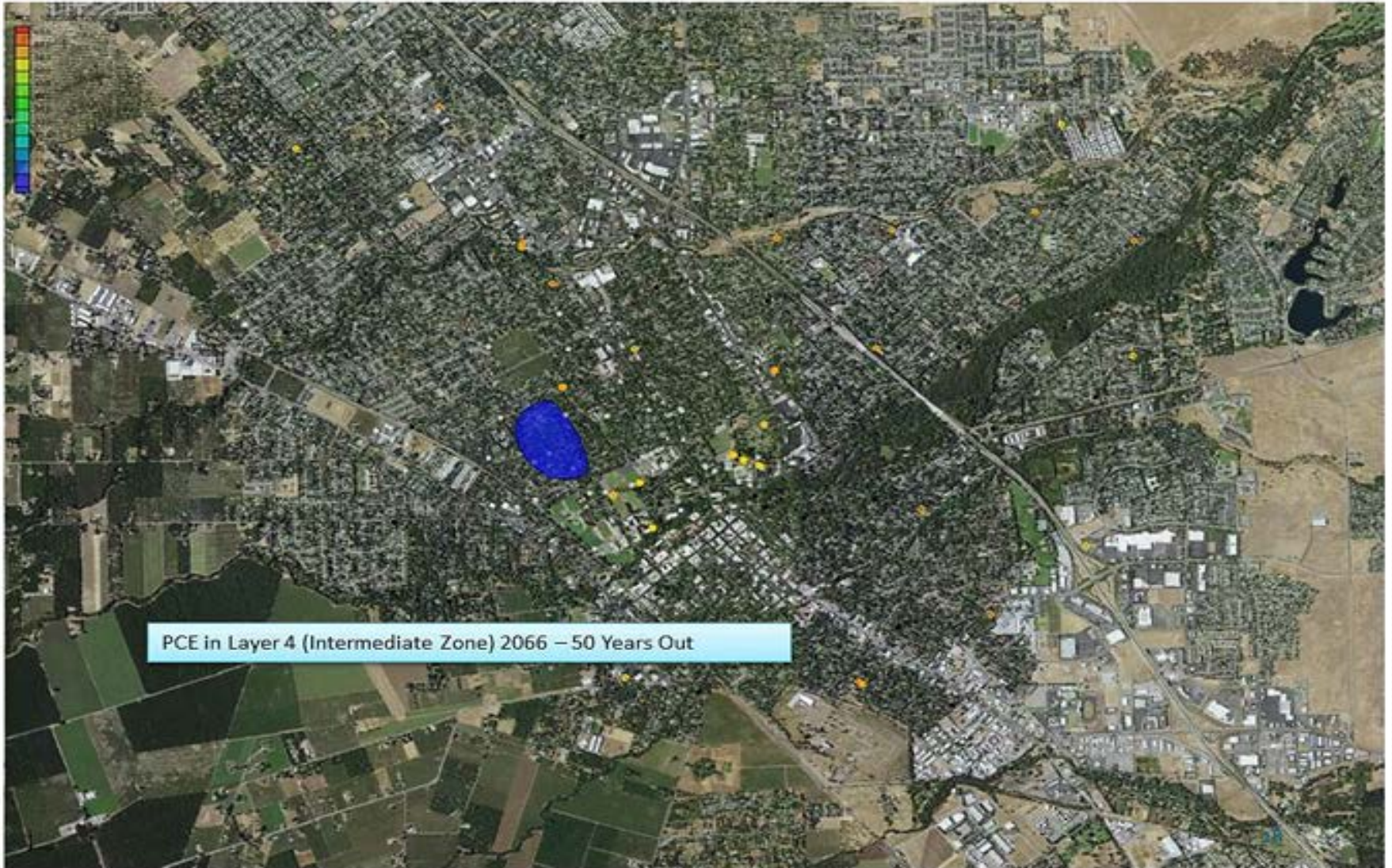
# Model of Current Plume



# 10-Yr Simulation



# 50-Yr Simulation



# Groundwater Restoration & Recharge

- Western leading edge of the plume requires hydraulic containment.
- Evaluating using existing large diameter well as extraction well due to ideal location and configuration.
- Would require modifying the wellhead, conveyance line, NPDES permit, and treating water before discharge into Lindo Channel → Sacramento River.
- Proposition 1/AB445 funding is being pursued to help fund this project.



# Questions?

