

August 12, 2020 Public Meeting Summary: Overview of studies conducted by the United States Geological Survey as part of the State Water Resources Control Board Oil and Gas Regional Monitoring Program

- [Wright, et al., 2019. Groundwater quality of a public supply aquifer in proximity to oil development, Fruitvale oil field, Bakersfield, California. Applied Geochemistry, Volume 106, Pages 82-95.](#)
 - Analysis of groundwater quality in an aquifer used for public supply in proximity to the Fruitvale Oil Field showed effects from oil production activities on groundwater quality appear to be minimal. Groundwater quality in this area is primarily controlled by freshwater recharge from the Kern River.
- [Gillespie, et al., 2019. Groundwater salinity and the effects of produced water disposal in the Lost Hills–Belridge oil fields, Kern County, California. AAPG Environmental Geosciences, Volume 26, No. 3, Pages 73-96](#)
 - Salinity mapping near the Lost Hills and Belridge oil fields shows changes in the groundwater table and salinity in the Tulare aquifer, and overlying alluvium over time. These changes are likely from activities associated with underground injection and produced water ponds.
- [Ball, et al., 2020. Probabilistic categorical groundwater salinity mapping from airborne electromagnetic data adjacent to California's Lost Hills and Belridge oil fields. Water Resources Research, 56, e2019WR026273.](#)
 - Airborne electromagnetic surveys near the Lost Hills and Belridge oil fields show a layered salinity structure with shallow saline water overlying the fresher Tulare aquifer separated by a clay layer. Study results showed zones of saline water downgradient of produced water disposal ponds. Downgradient of unlined surface water canals, there is fresher groundwater. This study did not investigate the cause(s) of the saline groundwater.
- [McMahon, et al., Occurrence and Sources of Radium in Groundwater Associated with Oil Fields in the Southern San Joaquin Valley, California. Environmental Science & Technology, Volume 53, No. 16, Pages 9398-9406](#)
 - Radium concentrations can be higher in oilfield water. Radium can be mobilized from aquifer sediments as high salinity water percolates into the subsurface from disposal ponds. These interactions were determined from comparing radium isotopes and other chemical data in groundwater to disposal pond and injection well water including noble gas data showing high radium groundwater was affected by pond seepage rather than deep brine migration.
- [Everett, et al., 2020. Multiple-well monitoring site adjacent to the Lost Hills oil field, Kern County, California: U.S. Geological Survey Open-File Report 2019–1114, p. 8](#)
 - USGS installed a multiple-well monitoring site near Lost Hills Oil Field. Groundwater-level and historic pressure profiles indicate aquifer clay layers can restrict vertical flow in some areas.