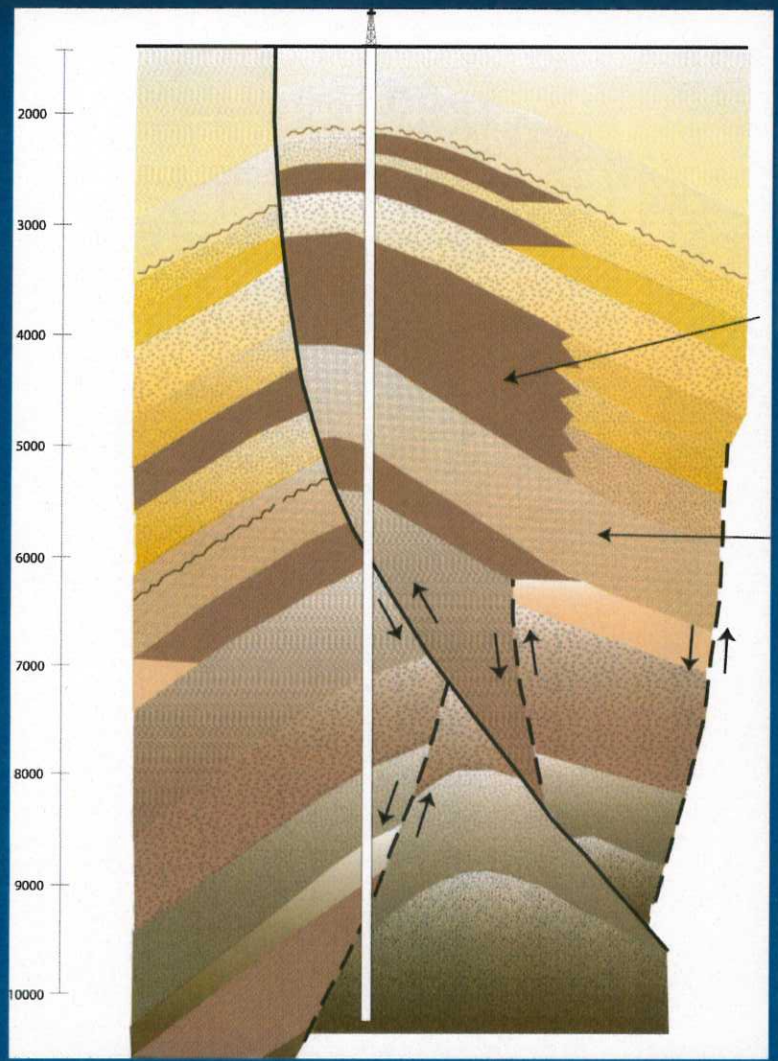
California's Regulation of Hydraulic Fracturing in Oil and Gas Production

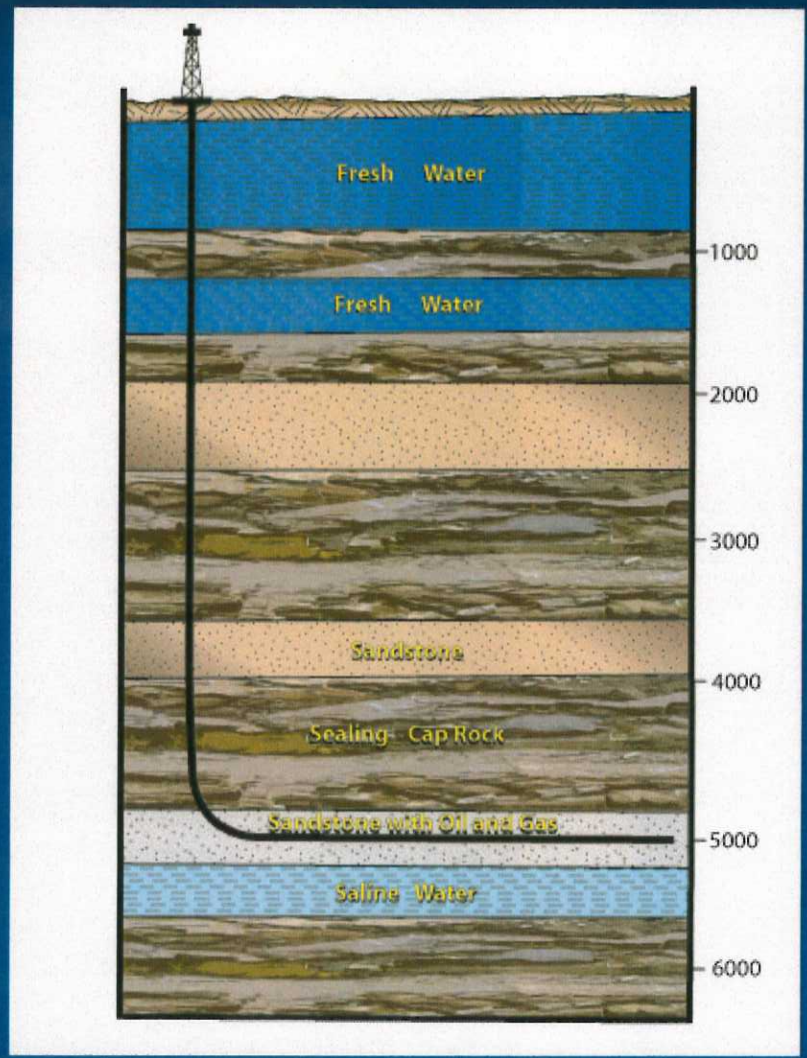
An Informational Hearing by the California State Senate's
Committee on Natural Resources and Water and
Committee on Environmental Quality

Presentations by:

- California Department of Conservation
  Division of Oil, Gas and Geothermal Resources
  California Geological Survey
- California Department of Toxic Substance Control
- California State Water Resources Control Board
- California Air Resources Board

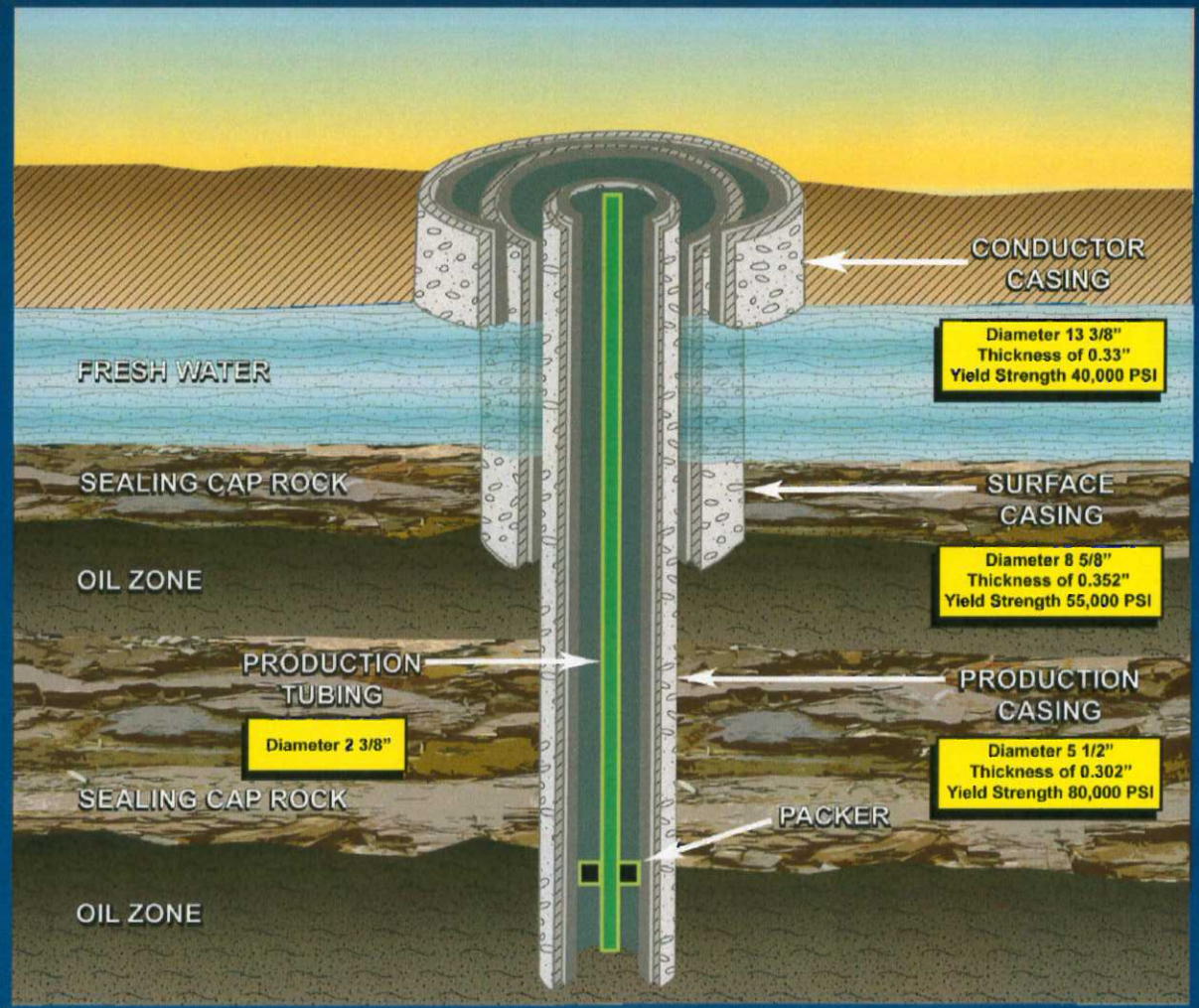
Geology of Oil and Gas Deposits





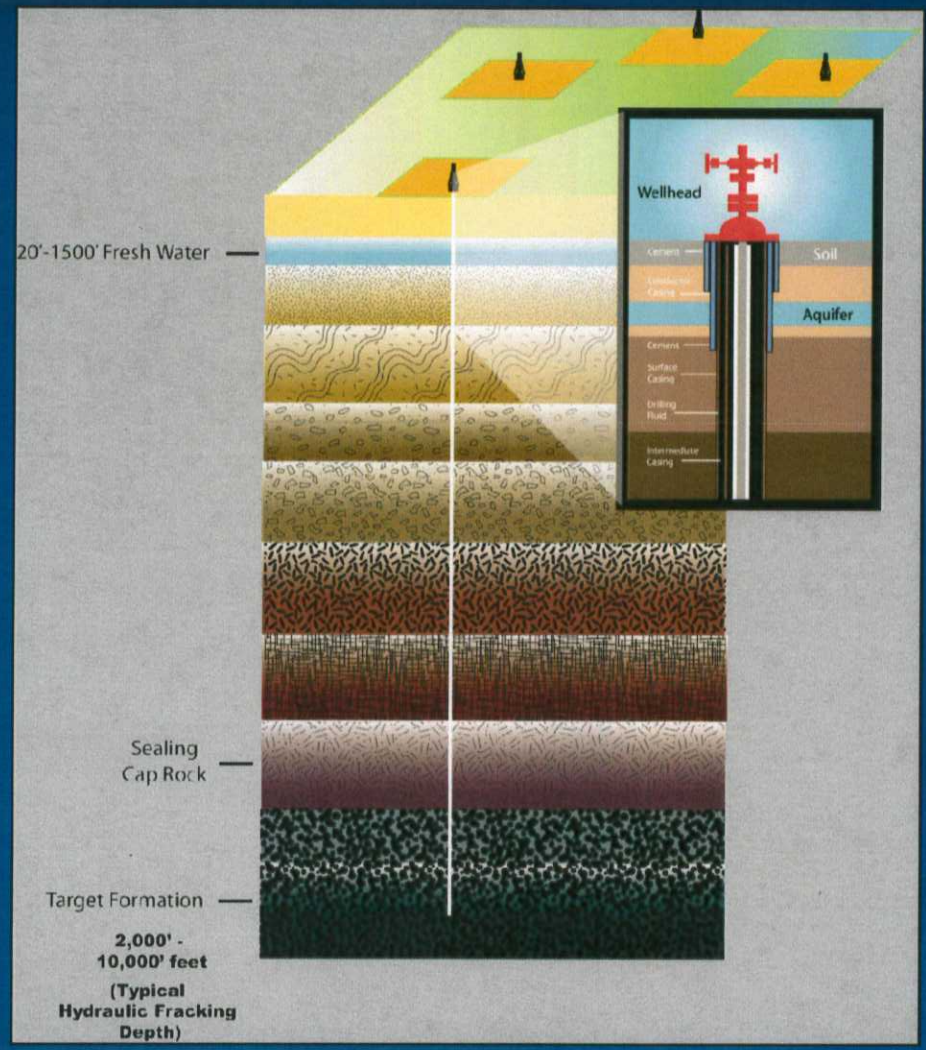
Oil and Gas Well Design

- Metal and cement casing across water and hydrocarbon zones
- Required of ALL oil and gas wells
- "Zonal Isolation"



Hydraulic Fracturing

- Production stimulation
- Short-term application of focused pressure, isolated to target formation
- New or expanded fractures in formation allow increased flow to well



Discussion Draft of Proposed Hydraulic Fracturing Regulations

- Foundation of current well construction standards
- Testing well integrity, pre- during, and post- HF
- Notification of Department, public
  - Pre- and post-HF operation notice
- Trade Secret provisions
- FracFocus.org

Induced Seismicity

- Seismic events attributable to human activities are "induced seismicity".
- Both human "induced" and "naturally occurring" seismic events are the results of rapid adjustments to changes in the stresses present in the Earth's crust.
- Several types of human activities induce seismicity, and their causes are well understood.

Induced Seismicity Findings

The Natural Research Council (2012) Report *Induced Seismicity Potential in Energy Technologies* concluded:

(1) "The process of hydraulic fracturing a well as presently implemented for shale gas recovery does not pose a high risk for inducing seismic events;

(2) Injection for disposal of waste water derived from energy technologies into the subsurface does pose some risk for induced seismicity, but very few events have been documented over the past several decades relative to the large number of disposal wells in operation."

Department of Toxic Substances Control

- DTSC regulates the generation, accumulation, transportation and management and disposal of hazardous waste
- DTSC does not regulate the use of materials in industrial processes
- DTSC's regulations - All waste generators required to determine whether their wastes are hazardous
- Hazardous wastes:
  - toxic, corrosive, ignitable, or reactive
- Oil and gas production wastes
  - Excluded from federal regulation
  - Not excluded from state regulation
- 2002 DTSC study – Most high volume oilfield wastes (produced waters, drilling wastes, oily sludges) found nonhazardous

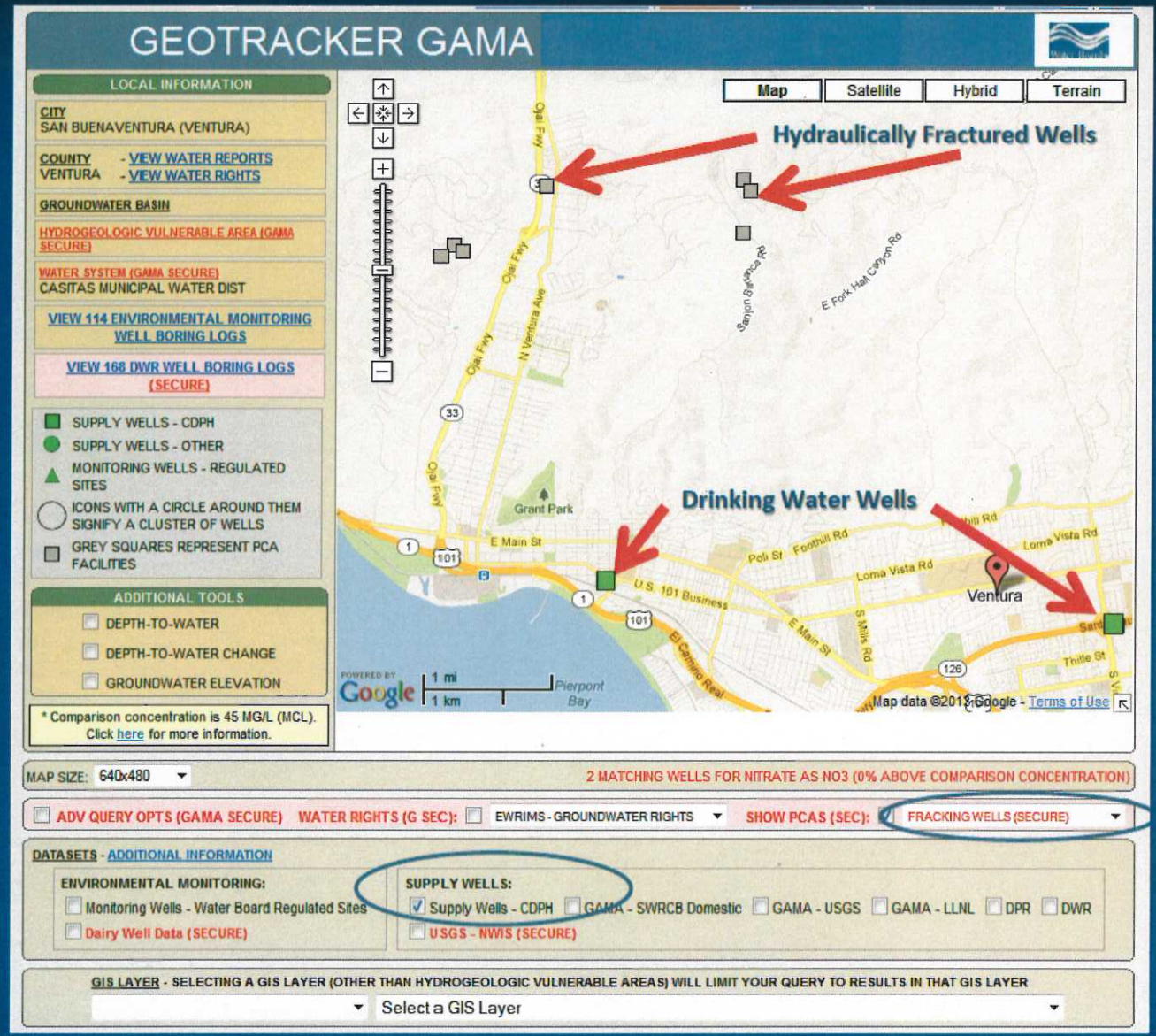
Department of Toxic Substances Control

- Disposal of oil and gas production wastes
  - If hazardous waste
    - Disposal at DTSC permitted facility
    - Class II injection well system (exempt from DTSC authority)
- Over 800 active oil and gas production "generators" in California
  - Hazardous wastes being sent under manifest to permitted facilities
  - Regular inspections by Certified Unified Program Agencies (local government)
- Fracking
  - If fracking fluids are hazardous wastes; fully regulated
  - With proposed expansion of fracking activity, more wastes generated – some could be hazardous
  - DTSC is working with DOGGR on its regulations to ensure they complement and integrate hazardous waste requirements

Water Boards & Hydraulic Fracturing Activities

- Existing Authority
  - Regulate Discharges of Waste
  - Cleanup and Abate Spills
- Current Activities at Oil Fields
  - 1988 MOA
  - Regulation of Wastewaters
  - Commenting on draft DOGGR regulations
- Integrating hydraulic fracturing with existing water well information on Water Boards GeoTracker GAMA
- Coordinating with DOGGR to ensure protection of water quality

GeoTracker GAMA



California Air Resources Board

Statutory Framework (Source & Pollutant Type)		
	ARB	Air Districts
Criteria Pollutants • Volatile organic compounds (VOC) • Oxides of nitrogen • Particulates	Mobile Sources • Vehicles • Portable equipment • Fuels • Consumer products	Stationary Sources • Industrial facilities & equipment • Portable equipment
Greenhouse Gases	Mobile Sources Stationary Sources	
Toxic air contaminants	Mobile Sources Stationary Sources	Stationary Sources

- Current district rules on oil & gas operations
  - Prohibit venting and limit leaks in piping and equipment

California Air Resources Board

- ARB rulemaking on oil & gas operations
  - Build on district rules, expand best practices
  - Methane not a VOC, not typically covered by district rules
  - ARB regulation would reduce GHGs, capture VOCs as co-benefit
- Initial steps already taken
  - Industry survey, results posted 2011
  - Preliminary test method developed
  - Initiating public process to develop GHG measure