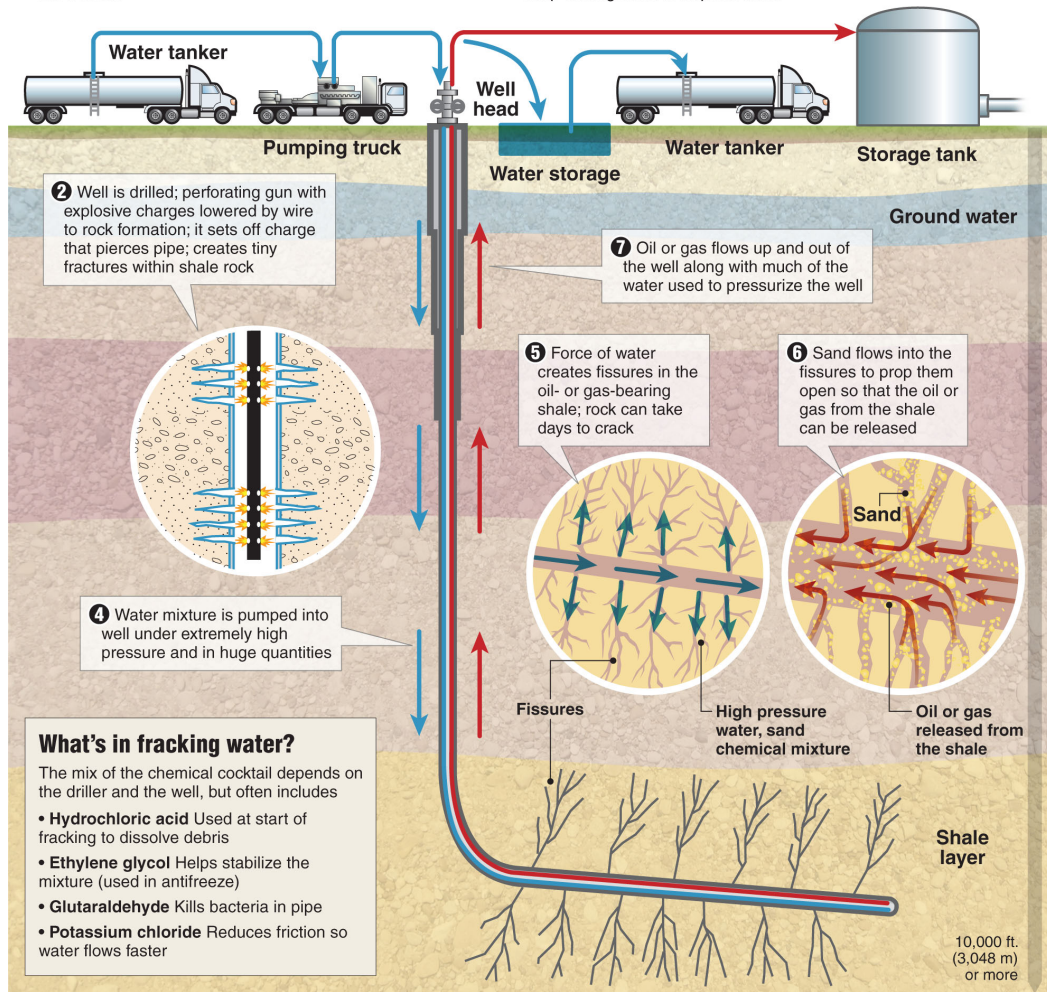




The ins and outs of fracking

Hydraulic fracturing, or "fracking," is a method of extracting oil and gas deposits that are inaccessible by conventional drilling. Fracking has become increasingly common over the past decade and is largely responsible for the current energy boom in the United States.

- 1 3 million to 6 million gal. (11 million to 23 million l) of water are trucked to the well site
- 2 Well is drilled; perforating gun with explosive charges lowered by wire to rock formation; it sets off charge that pierces pipe; creates tiny fractures within shale rock
- 3 Mixture of water, sand and chemicals is pumped into the well
- 4 Water mixture is pumped into well under extremely high pressure and in huge quantities
- 5 Force of water creates fissures in the oil- or gas-bearing shale; rock can take days to crack
- 6 Sand flows into the fissures to prop them open so that the oil or gas from the shale can be released
- 7 Oil or gas flows up and out of the well along with much of the water used to pressurize the well
- 8 The water is separated from the oil or gas and is stored to be trucked away, treated or injected deep underground in disposal wells
- 9 The gas or oil is stored for delivery to refineries or markets



What's in fracking water?

The mix of the chemical cocktail depends on the driller and the well, but often includes

- **Hydrochloric acid** Used at start of fracking to dissolve debris
- **Ethylene glycol** Helps stabilize the mixture (used in antifreeze)
- **Glutaraldehyde** Kills bacteria in pipe
- **Potassium chloride** Reduces friction so water flows faster

Sources: McClatchy-Tribune, ProPublica, FracFocus, Dallas Morning News, McClatchy Washington Bureau

Graphic: Mitchell Brooks, The Sacramento Bee

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Diagram explains hydraulic fracturing, or "fracking," a controversial process that injects large amounts of water into layers of underground shale to extract the oil and gas trapped inside it; fracking is largely responsible for the current energy boom in the U.S. MCT/The Sacramento Bee 2013

Questions for image analysis.

1. What is represented in the diagram?
2. How do the levels of the diagram work together to function as a whole?
3. What argument(s) are being made in favor of this process?
4. What argument(s) are being made against this process?
5. What evidence is available in the diagram to support the different arguments?