Answers to Important Questions about the Oil & Gas Industry

WHIPPLEWOOD | CPAs

Background

- We are members of the South Metro Denver Chamber
- Our friends, families, neighbors and business colleagues often ask us questions about the Oil & Gas (O&G) industry
- Most of their questions concern:
  - Air
  - Land
  - Water
  - Hydraulic fracturing
- We decided to do some research and find answers to these important questions!

Why We Love Colorado

- We live in Colorado because we love:
  - 300+ days of sunshine a year
  - Clean air and water
  - Beautiful landscapes
  - Recreational opportunities
  - Robust economy
- We must protect our air, water and environment to maintain our Colorado way of life

Economic Impact

WHIPPLEWOOD CPAs

Oil & Gas Activity in Colorado

- As we all know, the O&G industry has a significant positive economic impact on the state of Colorado by:
  - Creating high-wage jobs
  - Bringing in outside investment
  - Operating in rural areas where high-wage jobs are otherwise scarce
  - Contributing to government funding through state and local taxes, including sales, use and property taxes

Colorado O&G Facts

- In 2012 alone, O&G was responsible for:
  - $9.3 billion in production value
  - $3.8 billion in employee income
  - An average industry wage of $70,000
  - $30 billion for Colorado's economy and support for over 110,000 jobs
  - $614 million in royalties paid to private landowners
  - $1.6 billion in public revenues for schools, parks, roads and the like

Source: Brian Lewandowski and Richard Wobbekind, "Assessment of Oil and Gas Industry: 2012 Industry Economic and Fiscal Contributions in Colorado," Business Research Division, Leeds School of Business, University of Colorado–Boulder, July 2013,
Source: IHS Global Insight, The Economic and Employment Contributions of Shale Gas in the United States,

More O & G Facts

- Because of hydraulic fracturing, the U.S. recently surpassed Russia as the #1 oil and natural gas producing nation in the world
- The average U.S. household will save more than $900 per year on their energy costs from 2012 to 2015
- Coloradans enjoy energy prices 23% lower than the U.S. average

Source: EIA, "U.S. expected to be largest producer of petroleum and natural gas hydrocarbons in 2013,"
Source: EIA, Residential Energy Consumption Survey;
Source: University of Colorado Boulder Leeds School of Business, Assessment of Oil and Gas Industry 2012 Economic and Fiscal Contributions in Colorado

Hydraulic Fracturing Ban: Economic Impacts

- $8 billion in lost GDP
- 68,000 jobs lost over a five-year period
- $4 billion in lost personal disposable income in the next one to five years
- Fewer jobs and decreased wages result in reduced household spending, which affects everything from construction to retail trade
- Loss of good community partners

http://media.bizj.us/view/img/2281201/economic-impact-of-fracking-moratorium-final-report-march-2014-032414.pdf

O&G Is Essential for the Colorado Way of Life

Petroleum products are used in:

Environmental Impact

WHIPPLEWOOD CPAs

Air

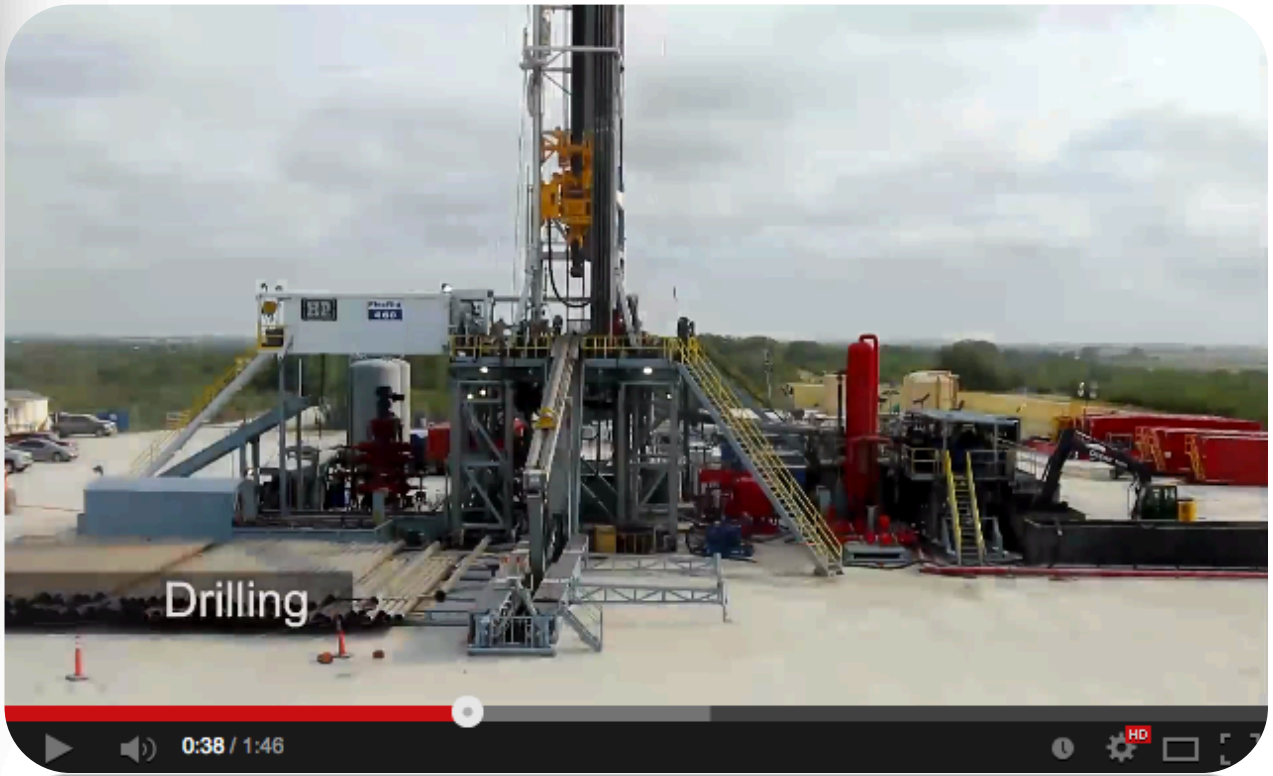
- Natural gas burns cleaner than coal, yielding fewer greenhouse gas emissions
- O&G producers must comply with extensive air-quality control requirements developed and approved by the Environmental Protection Agency (EPA) and the Colorado Air Quality Control Commission (CAQCC)
- 21.8% of Colorado's electricity comes from natural gas

Sources: Center for Climate and Energy Solutions, "Leveraging Natural Gas to Reduce Greenhouse Gas Emissions." June 2013. Retrieved from http://www.c2es.org/docUploads/leveraging-natural-gas-reduce-ghg-emissions.pdf; ANGA. "Power." *Natural Gas in My State*. Retrieved from http://thinkaboutit.org/power/#Colorado

Land

- The Department of the Interior (DOI), EPA and state regulatory bodies regulate all land issues
- Horizontal drilling—as occurs in hydraulic fracturing—allows for multiple wells in a single location, thus minimizing the amount of land required
- Regulations require land restoration after completion of wells

Timelapse of Drilling and Frac'ing a Well



Water

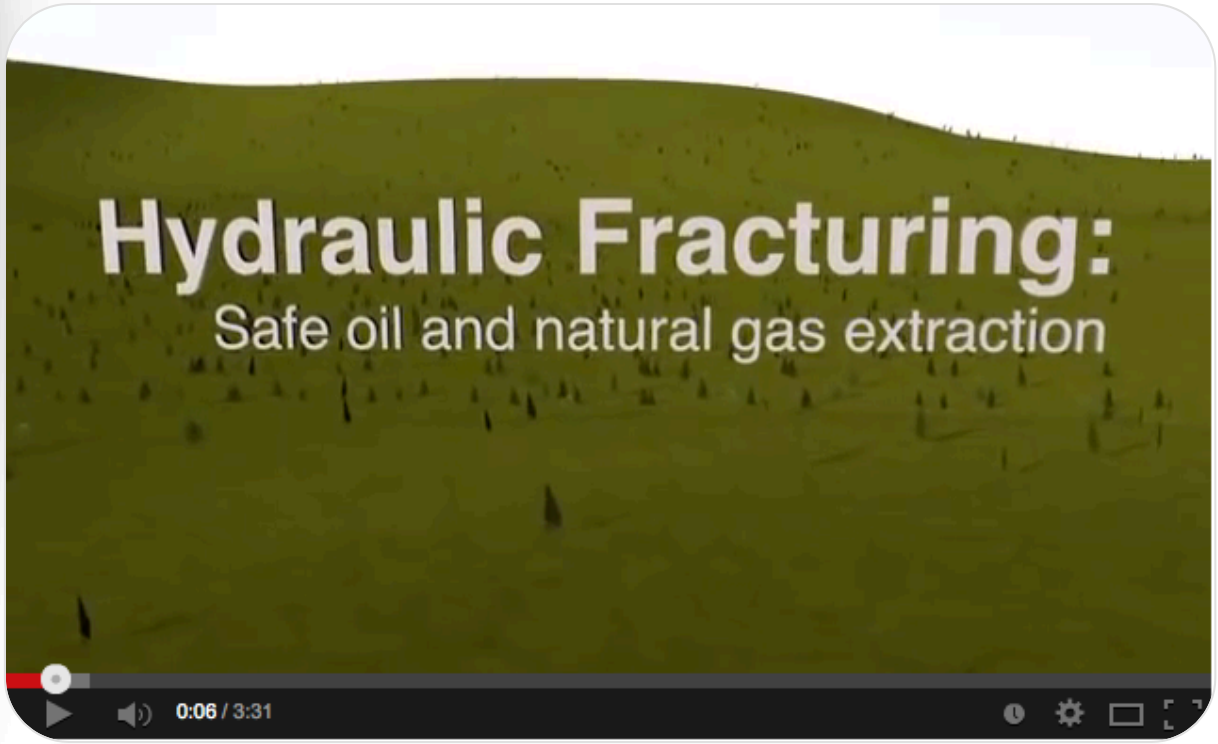
- To date, the EPA has determined that there has not been a single case of groundwater contamination due to hydraulic fracturing
- The EPA and state agencies closely monitor the O&G industry to ensure that water is used responsibly and treated properly
- In Colorado, the targeted formations for hydraulic fracturing are often more than 7,000 feet underground, and some 5,000 feet below any drinking water aquifers
- The amount of water used annually in the State of Colorado for hydraulic fracturing is less than 0.1% of all water used

Sources: EPA.gov, "Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs," retrieved from http://www.epa.gov/ogwdw/uic/pdfs/cbmstudy_attach_uic_exec_summ.pdf; EPA.gov, "Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources: Progress Report," retrieved from http://www2.epa.gov/hfstudy/study-potential-impacts-hydraulic-fracturing-drinking-water-resources-progress-report-0, Colorado Division of Water Resources

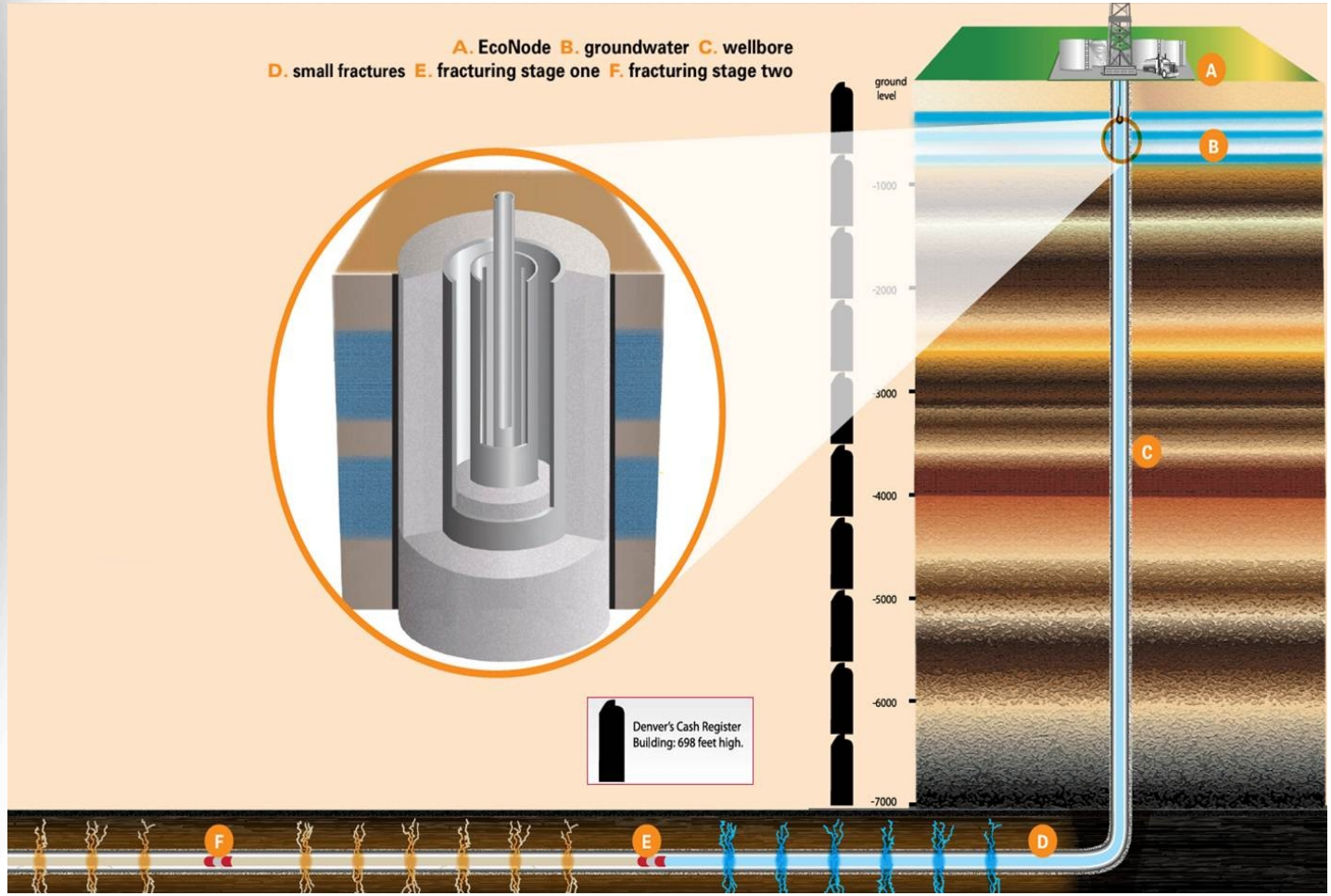
What Is Hydraulic Fracturing, or "Fracking"?

Hydraulic fracturing is the process of creating small cracks, or fractures, in deep, underground geological formations (7,000+ feet down) to liberate oil or natural gas and allow it to flow up the well for capture and use in heating our homes, fueling our cars and providing the electricity we all use for our televisions, computers and other devices.

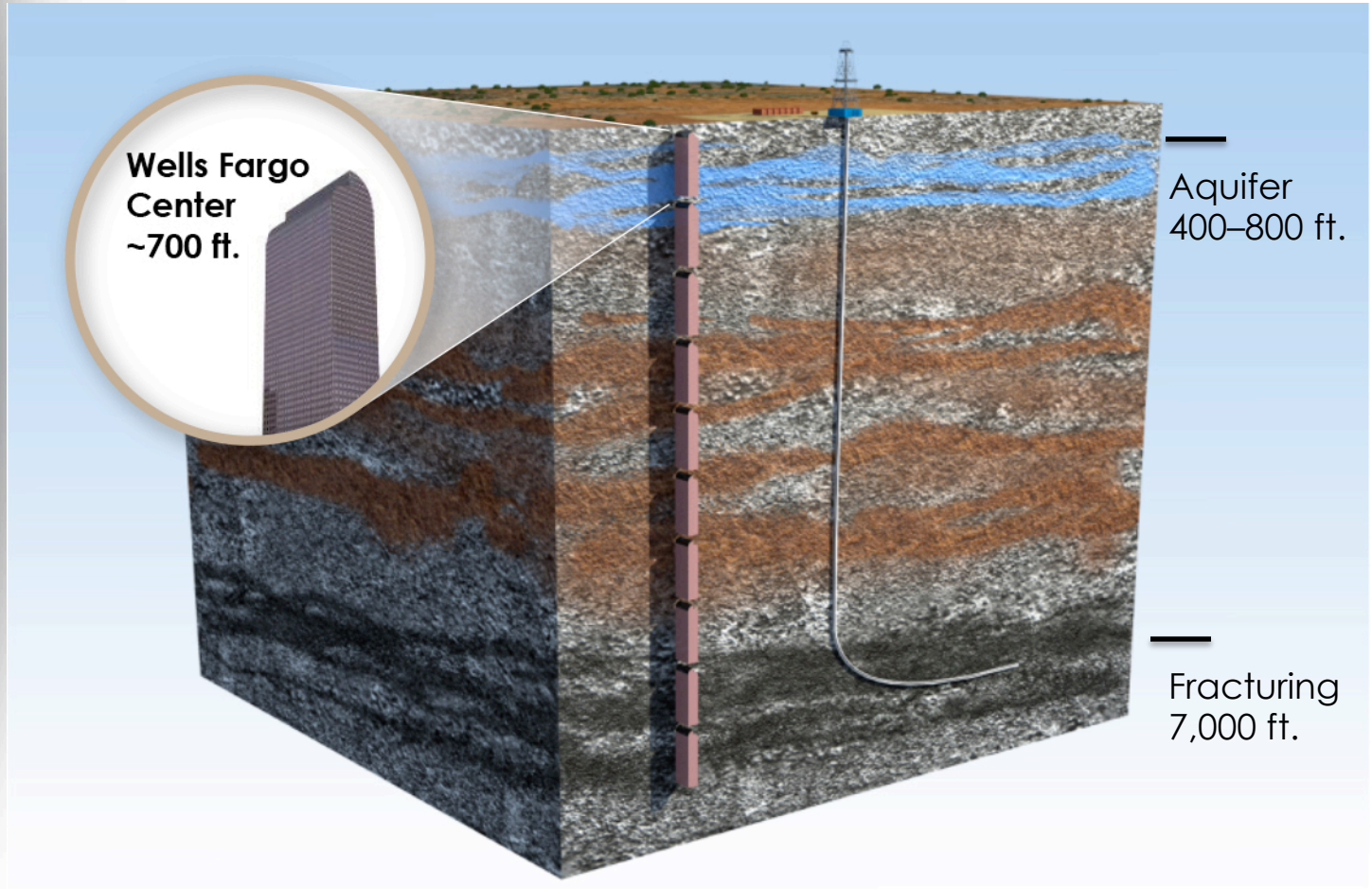
Hydraulic Fracturing



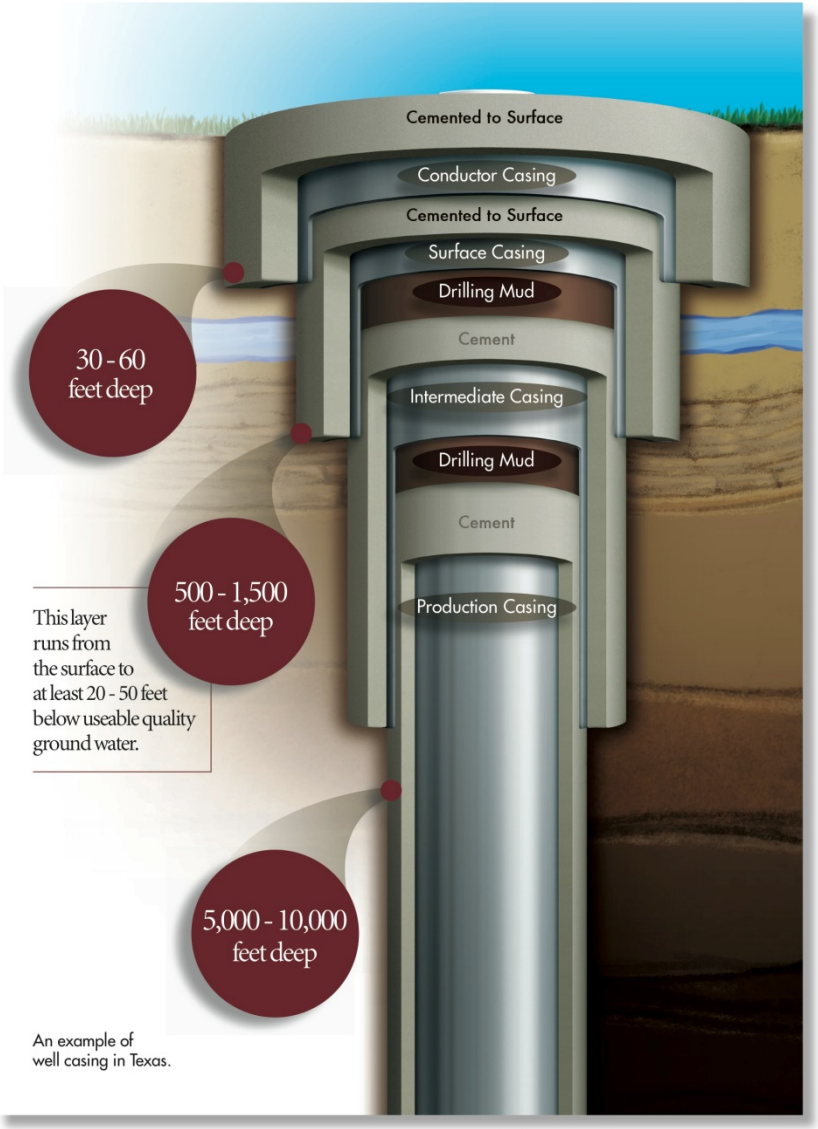
Well Diagram



Well Depth

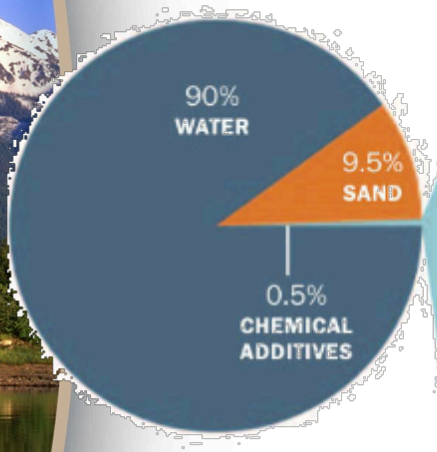

Wells Fargo
Center
~700 ft.
Aquifer
400–800 ft.
Fracturing
7,000 ft.

Structure of a Well



Source: "A Joint Association Education Message from the Oil and Gas Industry of Texas"
© Texas Oil & Gas Association, 2010

Ingredients Used in Hydraulic Fracturing



Compound	Purpose	Common application
Acids	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
Sodium Chloride	Allows a delayed breakdown of the gel polymer chains	Table salt
Polyacrylamide	Minimizes the friction between fluid and pipe	Water treatment, soil conditioner
Ethylene Glycol	Prevents scale deposits in the pipe	Automotive anti-freeze, deicing agent, household cleaners
Borate Salts	Maintains fluid viscosity as temperature increases	Laundry detergent, hand soap, cosmetics
Sodium/Potassium Carbonate	Maintains effectiveness of other components, such as crosslinkers	Washing soda, detergent, soap, water softener, glass, ceramics
Glutaraldehyde	Eliminates bacteria in the water	Disinfectant, sterilization of medical and dental equipment
Guar Gum	Thickens the water to suspend the sand	Thickener in cosmetics, baked goods, ice cream, toothpaste, sauces
Citric Acid	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
Isopropanol	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, hair coloring

Frac'ing Fluid Is 90% Water

State law requires full disclosure of frac fluid ingredients on www.fracfocus.org

Summary

Here's why we support the oil and gas industry in Colorado:

- Colorado's strong regulatory programs protect our air, land and water
  - Colorado Governor John Hickenlooper describes the state's oil and gas regulation as "the most comprehensive and stringent" in the country
  - Natural gas is a cleaner-burning energy alternative to coal and petroleum
  - Hydraulic fracturing can and is being done safely

- Oil and gas contributes to a robust Colorado economy:
  - Jobs are important
  - Tax revenues are significant for our schools and roads

So Now What?

- Get educated!
- Protect our Colorado economy by sharing how crucial it is that we support the oil and gas industry in our state
- Recognize the impact banning hydraulic fracturing will have on our state, and share the facts with your friends and neighbors
- Volunteer with groups like ours to share what you've learned

Questions?

If you have further questions about the O&G industry and the topics discussed here, please contact:

Patty Rodvold
Marketing and Business Development Manager
Whipplewood CPAs
Patty@whipplewoodcpas.com
303-551-8005

Educational Resources

For further information, please visit:

- leeds.colorado.edu
- www.epa.gov
- www.thinkaboutit.org
- www.blm.gov
- cogcc.state.co.us
- www.usgs.gov
- www.gwpc.org
- www.iogcc.state.ok.us
- www.fracfocus.org
- https://centerwest.org