

The Future Role of Natural Gas in the U.S.

R. Skip Horvath
President & CEO

FMEA-FMPA Annual Conference

July 20, 2011

Palm Beach, Florida

2001 to 2011 - A Decade Makes a Difference

Then

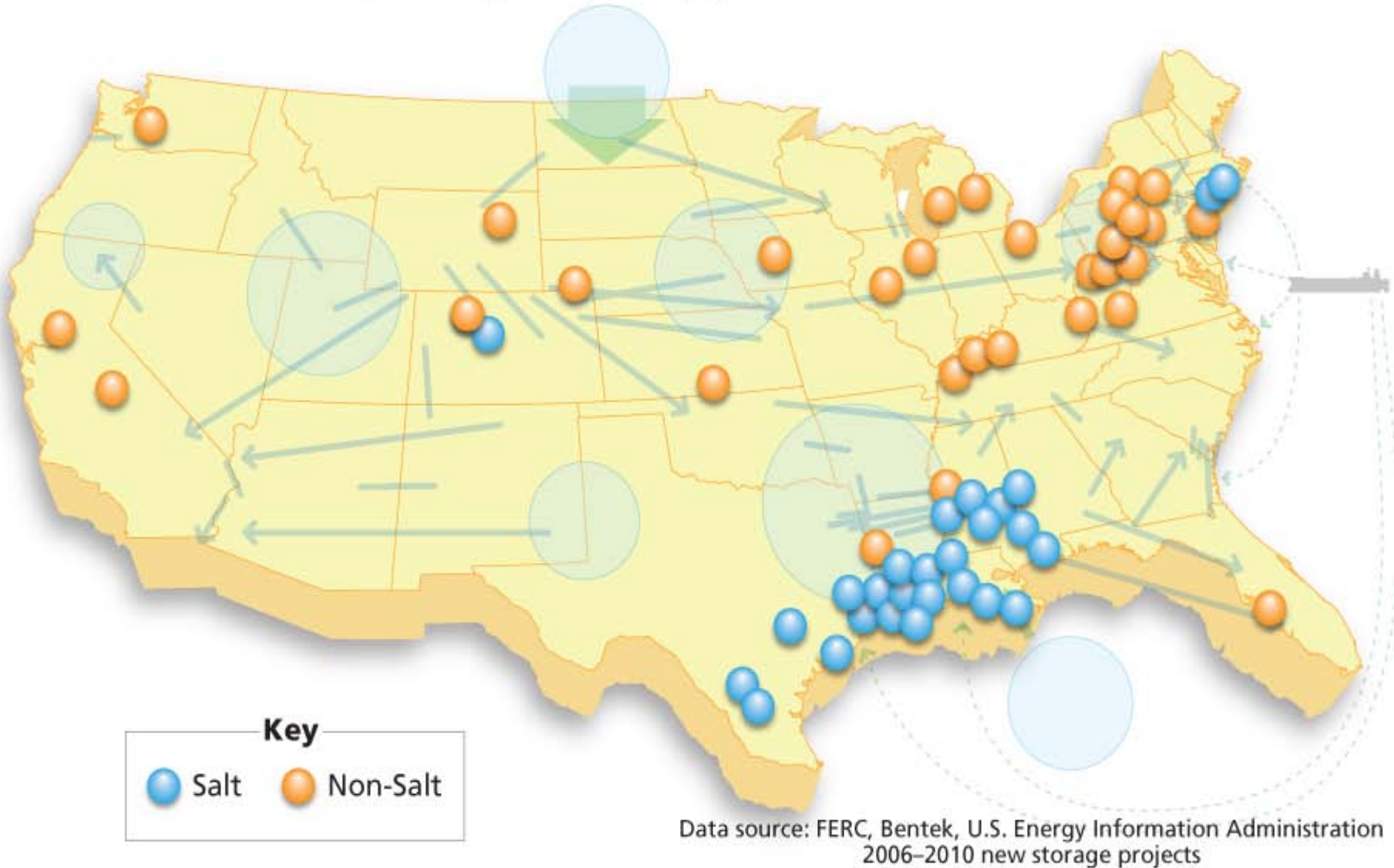
- **60-year supply and falling**
- **Shale known but uneconomic to develop**
- **Underground gas storage primarily traditional reservoir, operationally not very flexible**
- **Pipeline capacity growing incrementally**
- **Rising prices with several spikes**

Now

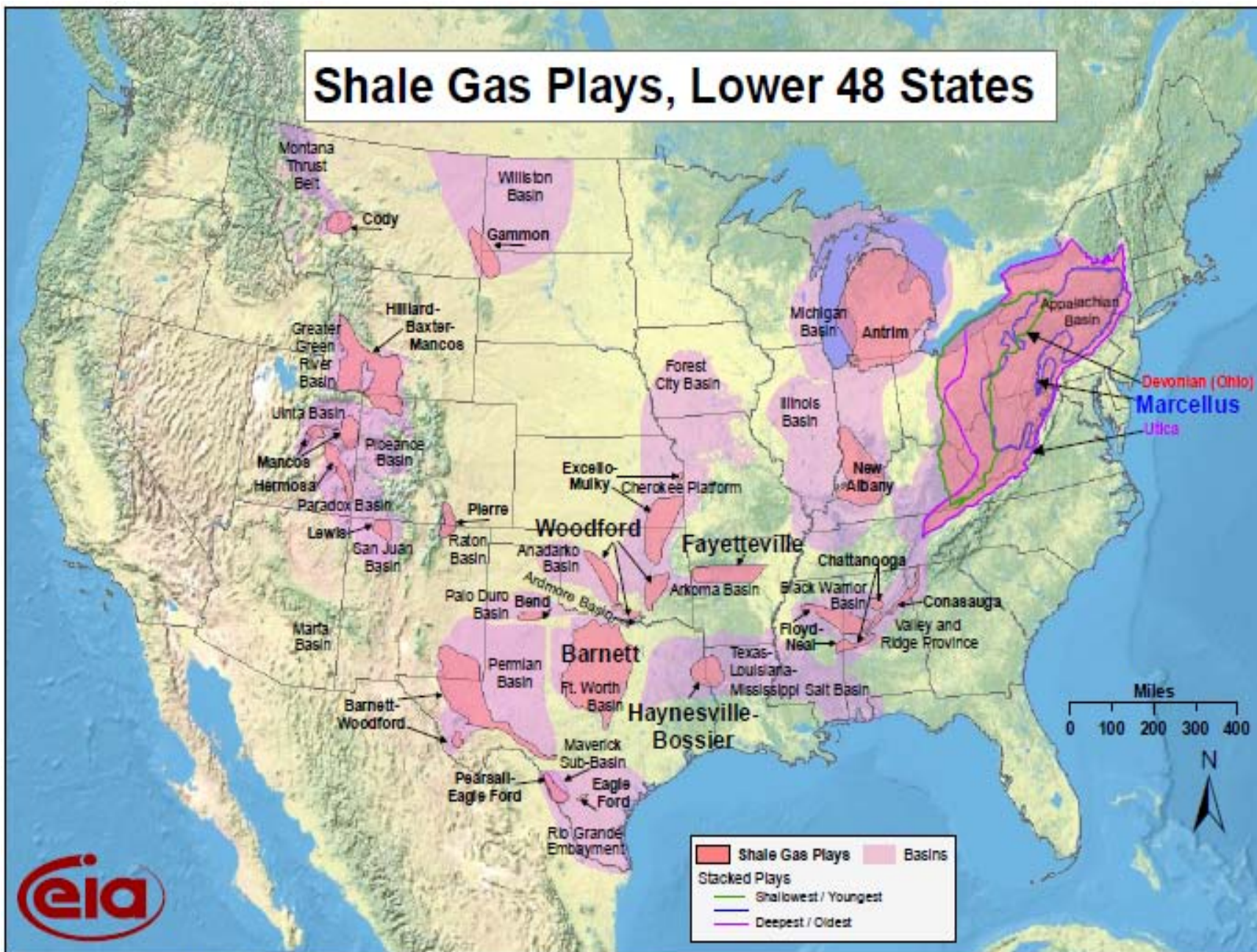
- **100+ years supply and growing**
- **Flourishing production, vast shale resources now accessible**
- **Storage boom with more flexible salt-cavern facilities and additional market area storage**
- **16,000+ miles of interstate pipeline added since 2000**
- **Plentiful supplies moderate prices and provide supply diversity**

Decade of Growing Natural Gas Infrastructure

Working storage capacity grew 22% 2006–2010

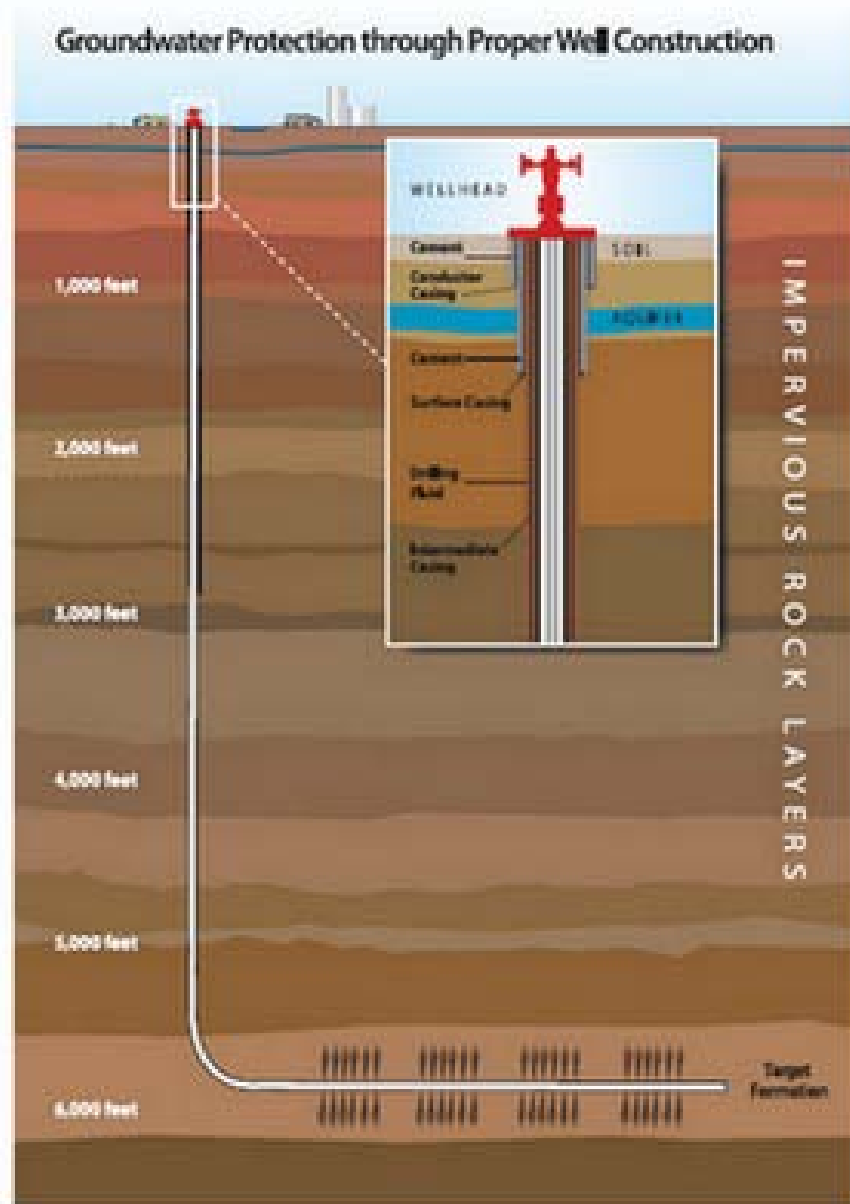


Shale Gas Plays, Lower 48 States



Source: Energy Information Administration based on data from various published studies.
 Updated: March 10, 2010

How Shale Produces Natural Gas

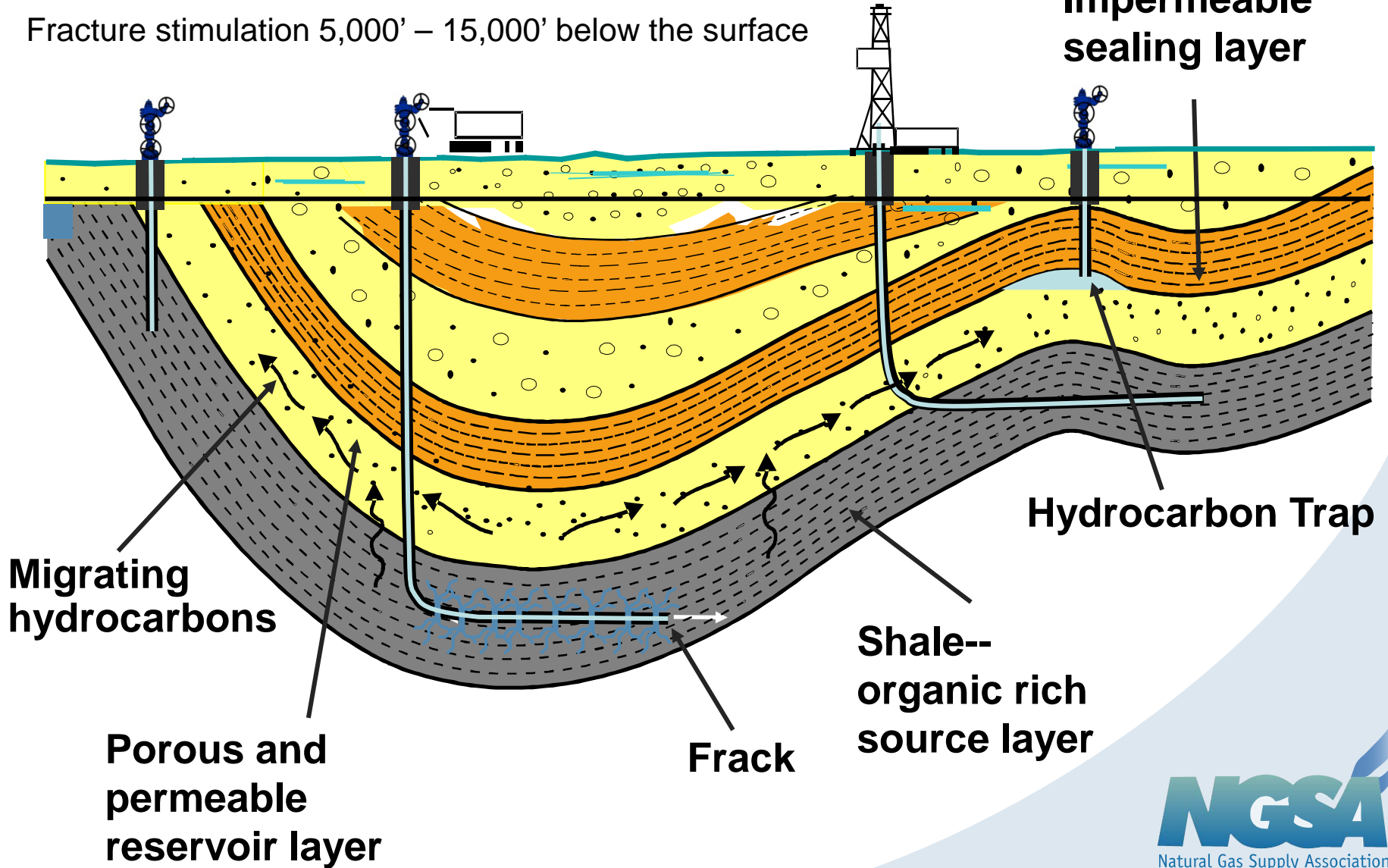


Source: Energy Tomorrow

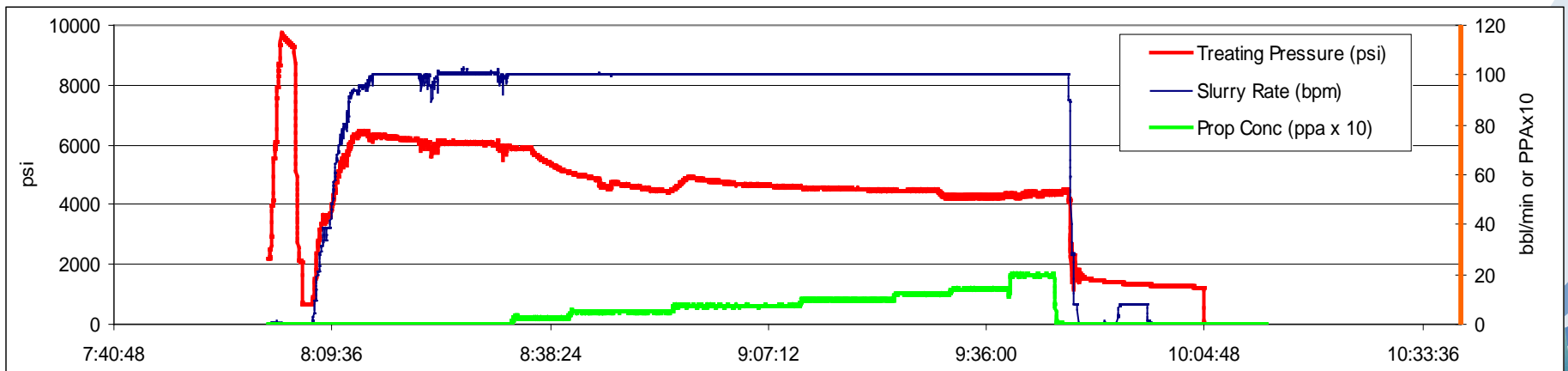
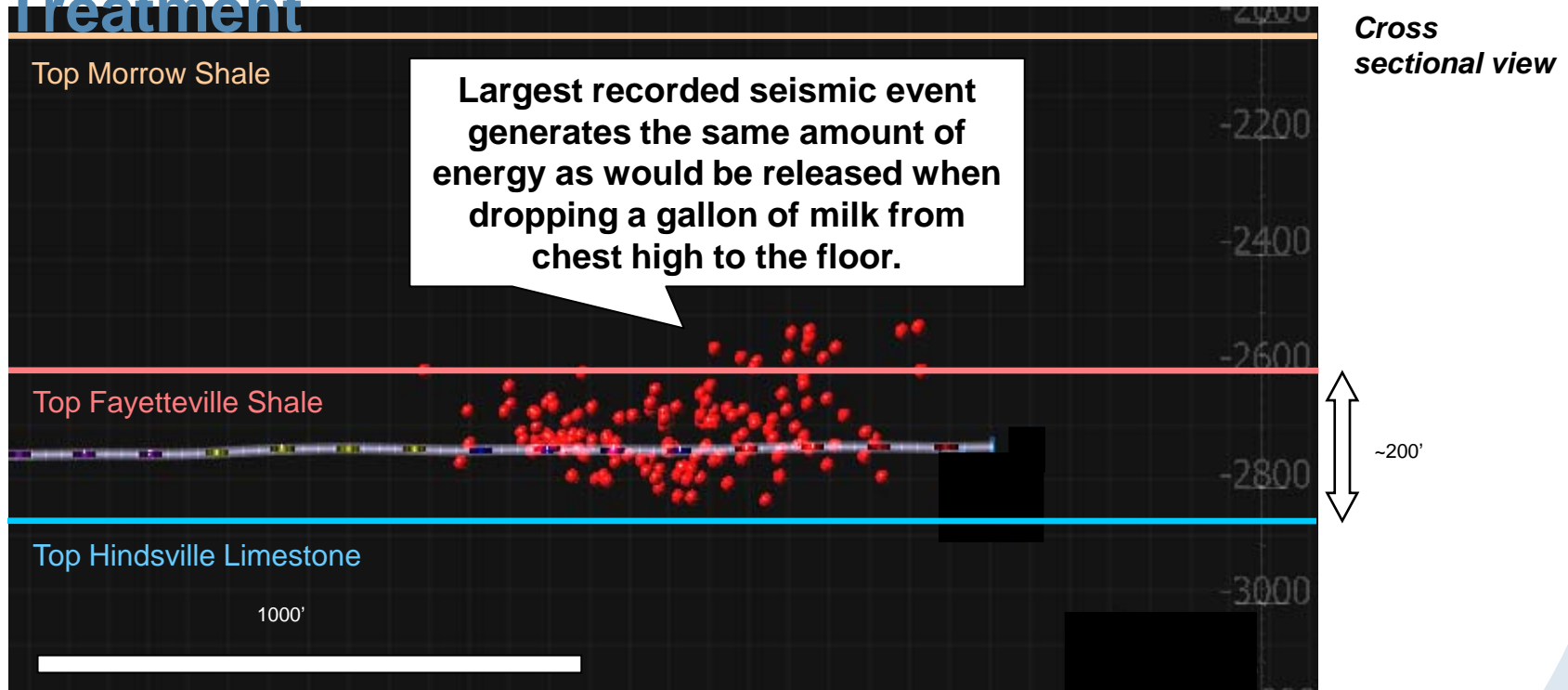
Technology's role: Finding the Source Rock

Fracture stimulation 5,000' – 15,000' below the surface

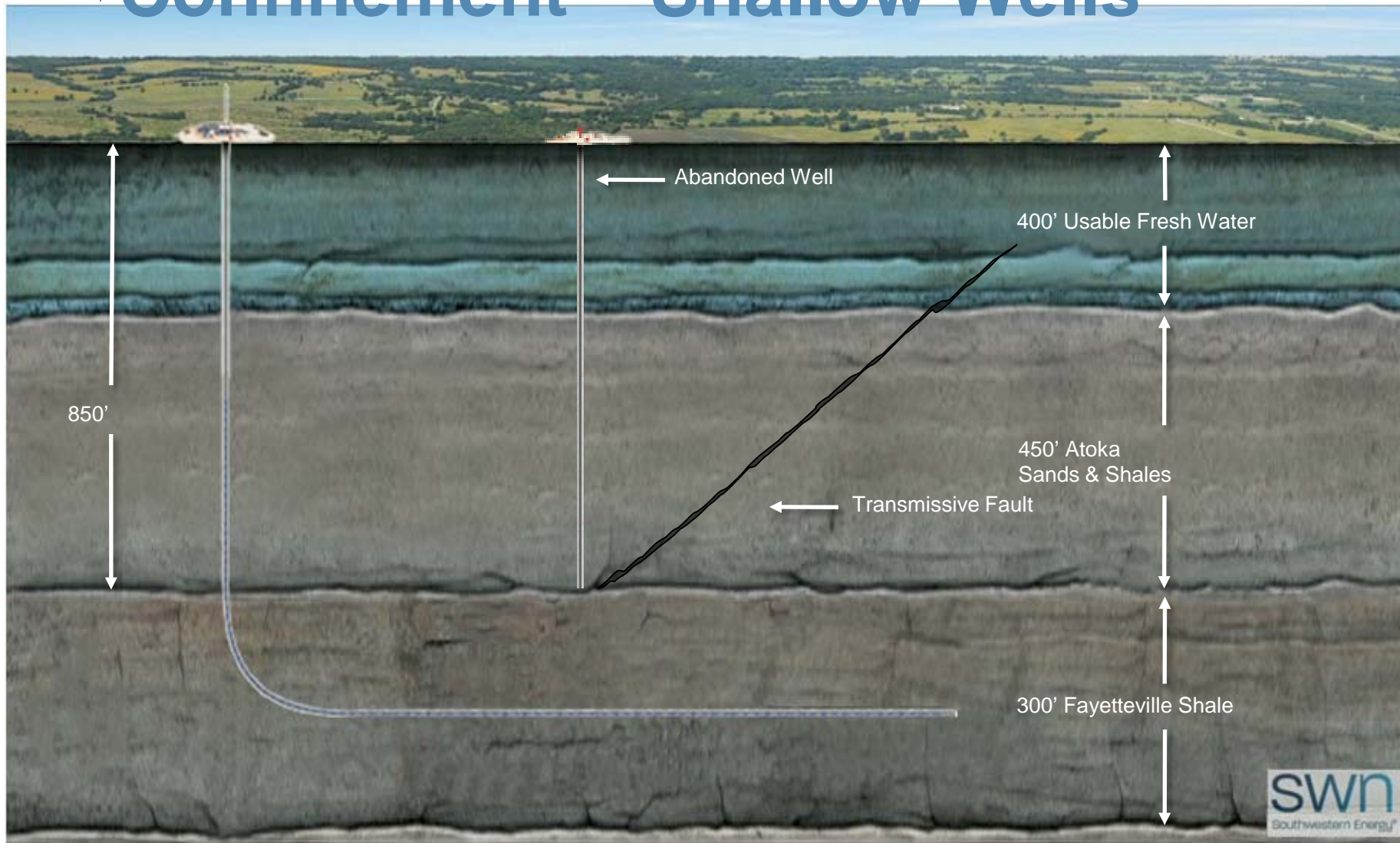
Impermeable
sealing layer



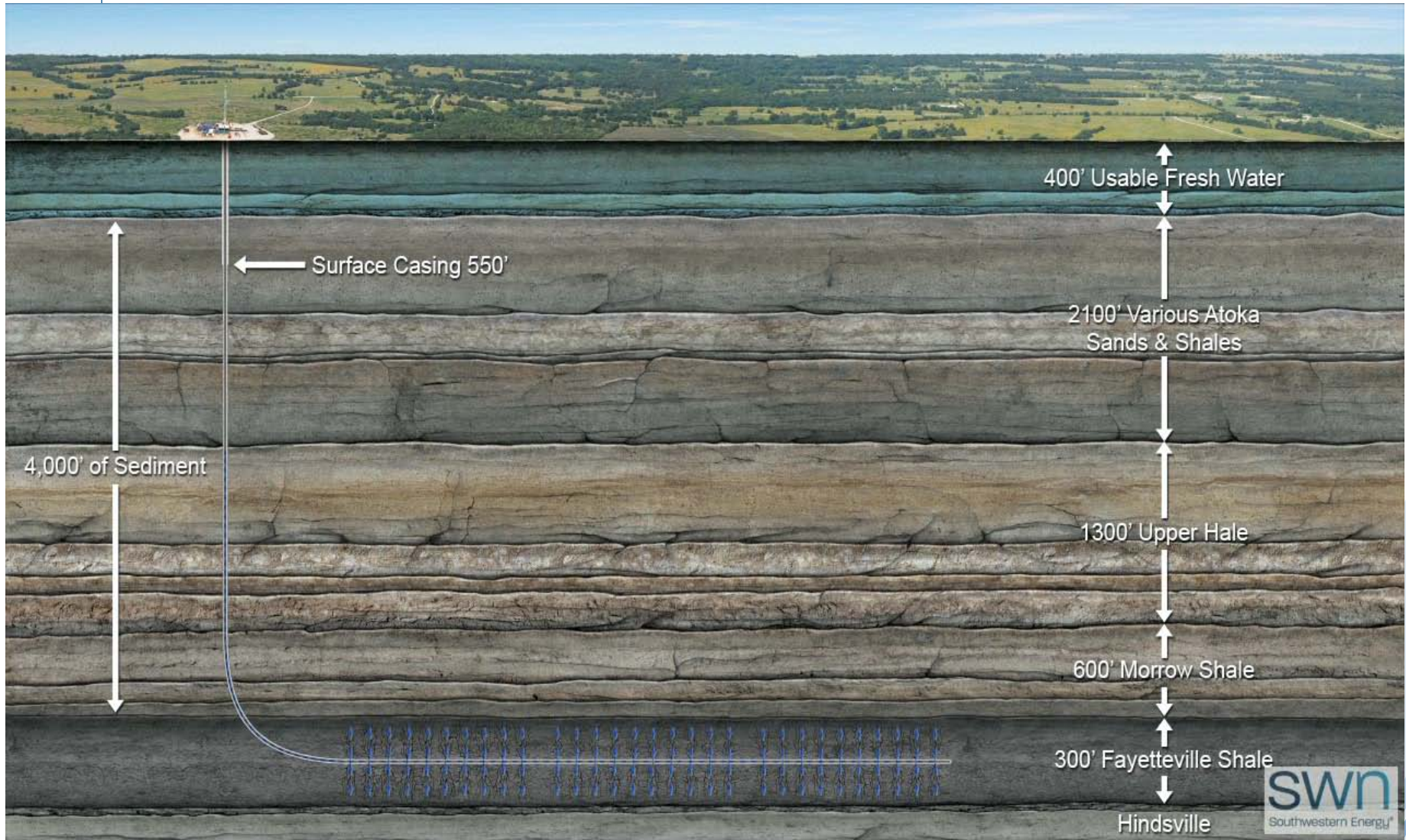
Microseismic Evaluation of Stimulation Treatment



Evaluating Stratigraphic Confinement – Shallow Wells

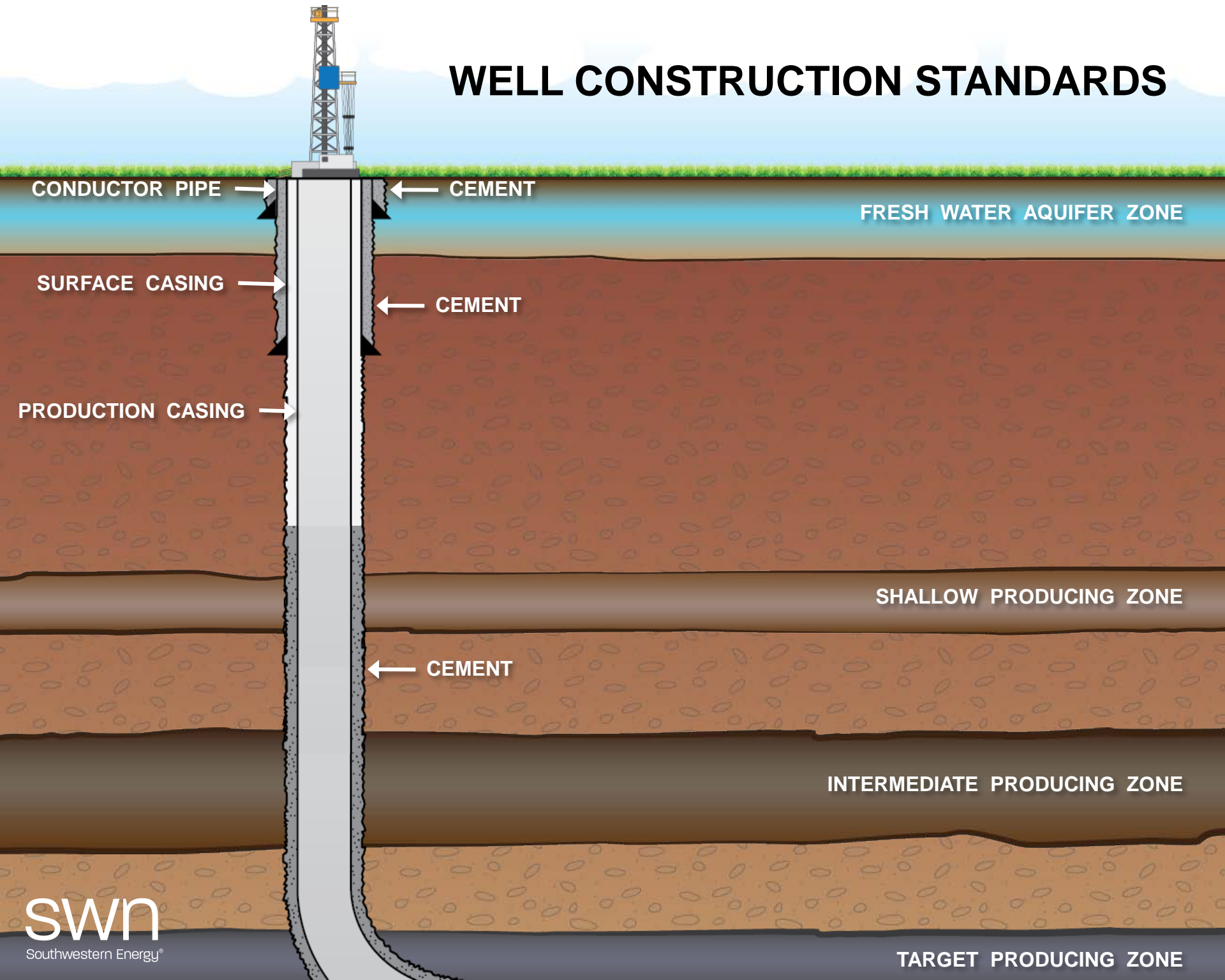


Well Construction Standards

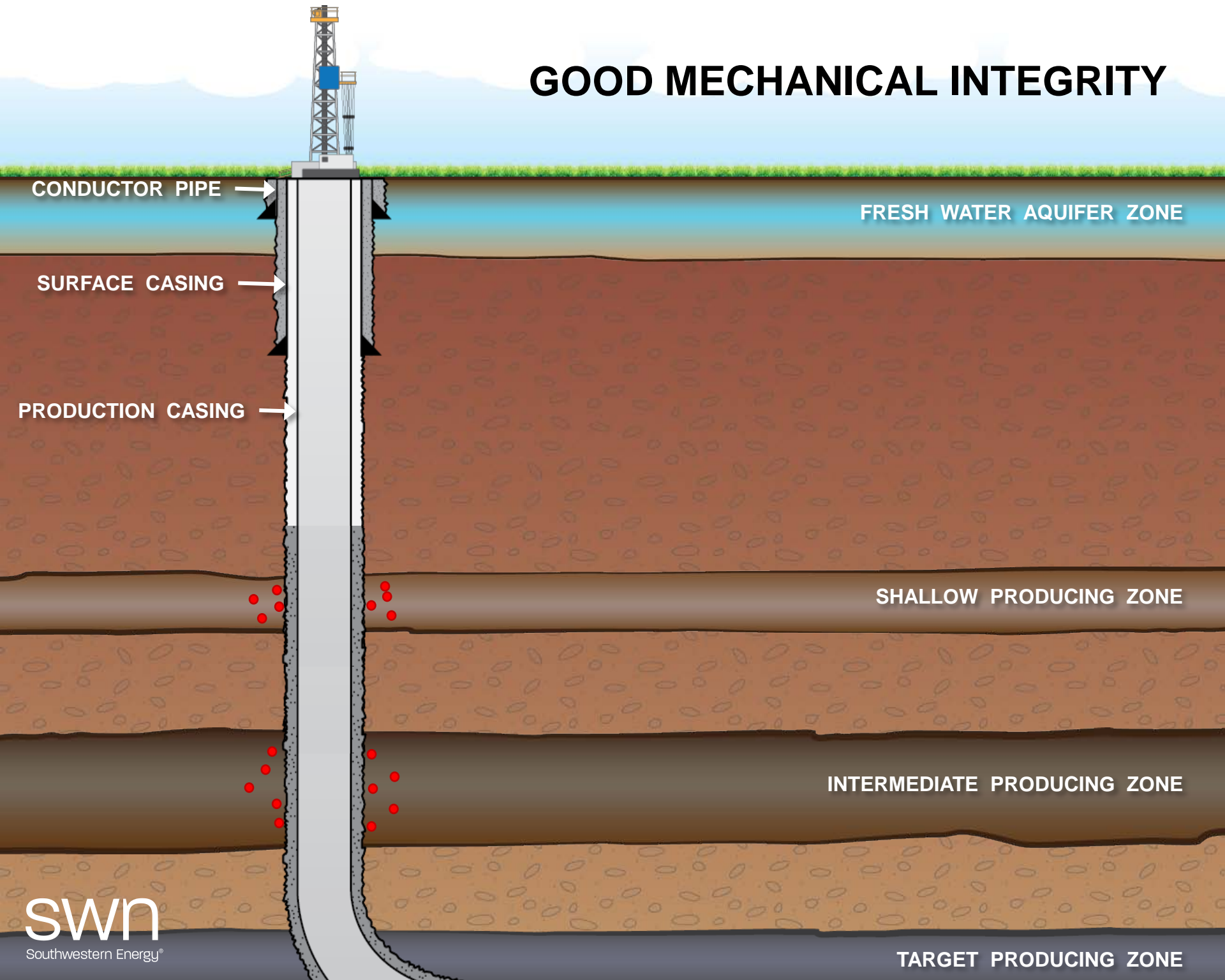


Cross sectional view

WELL CONSTRUCTION STANDARDS



GOOD MECHANICAL INTEGRITY



CONDUCTOR PIPE

FRESH WATER AQUIFER ZONE

SURFACE CASING

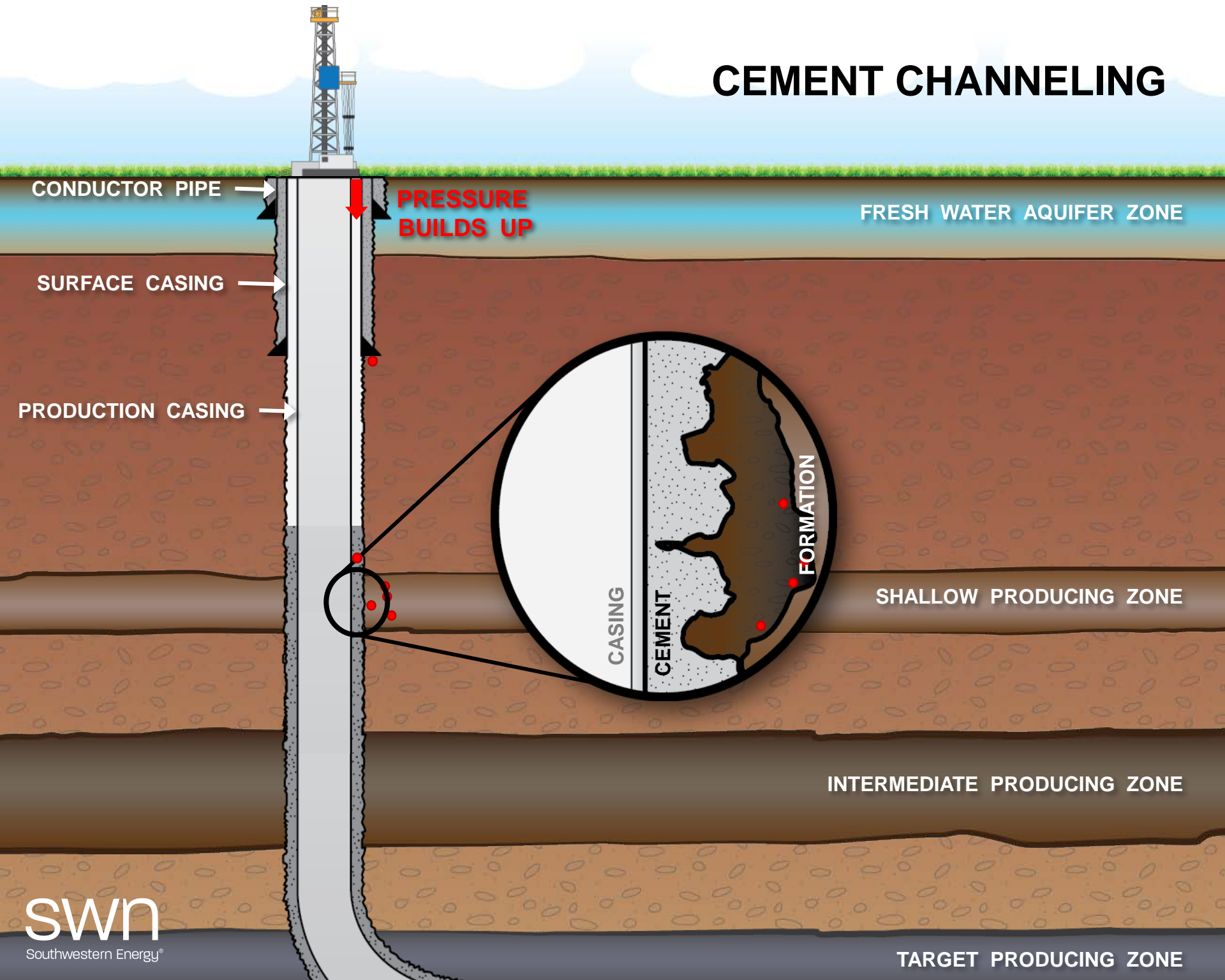
PRODUCTION CASING

SHALLOW PRODUCING ZONE

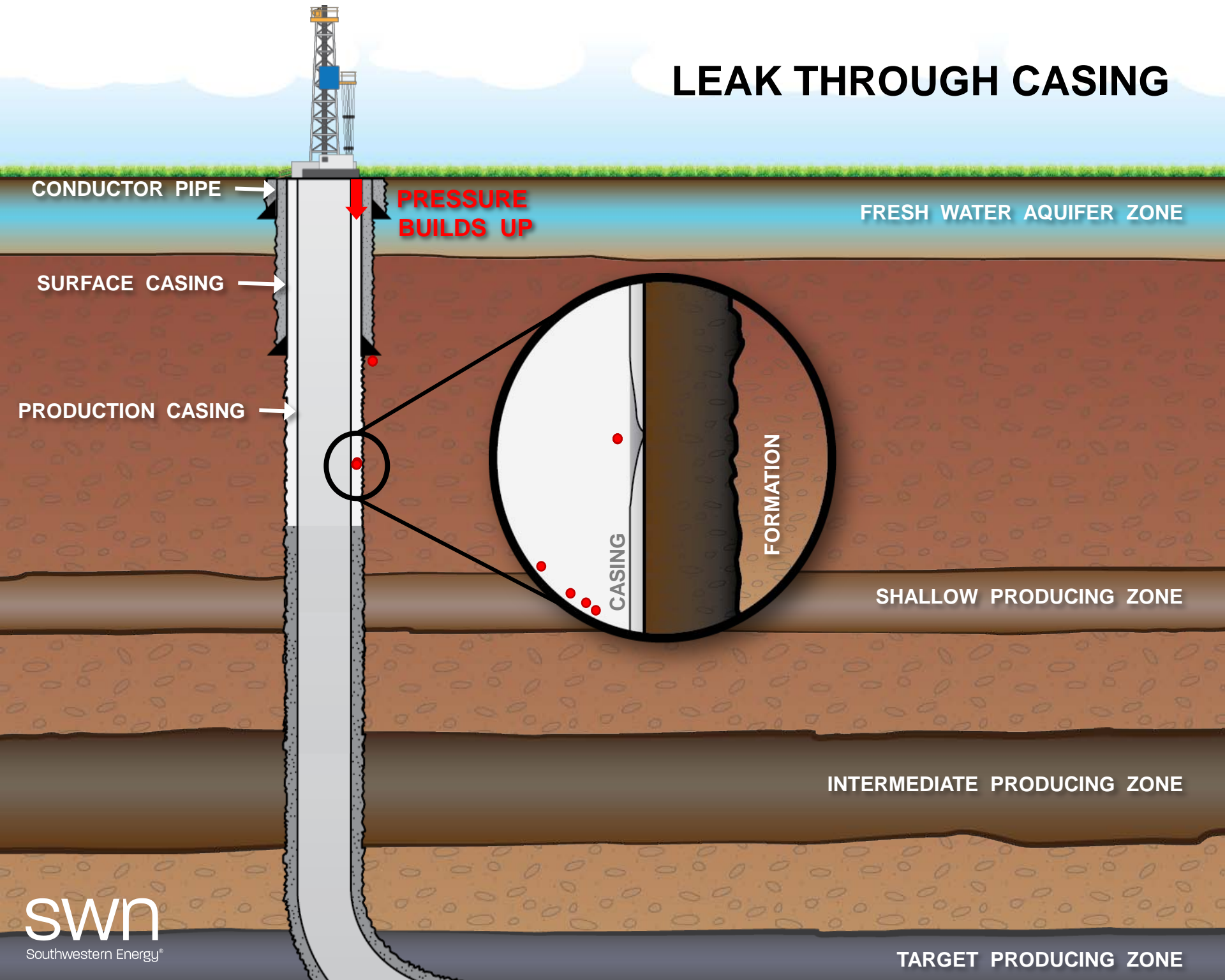
INTERMEDIATE PRODUCING ZONE

TARGET PRODUCING ZONE

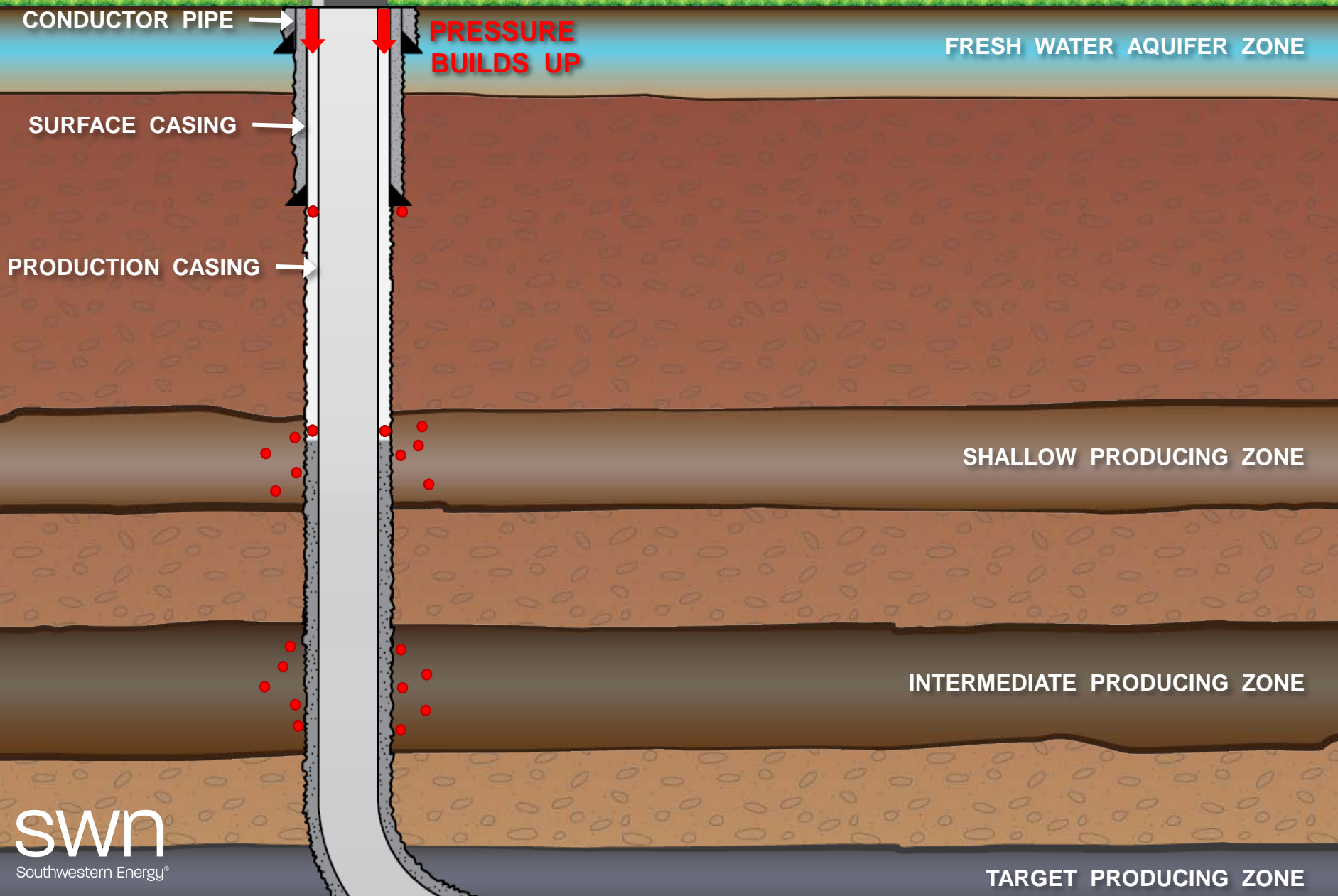
CEMENT CHANNELING



LEAK THROUGH CASING



INSUFFICIENT CEMENT COVER



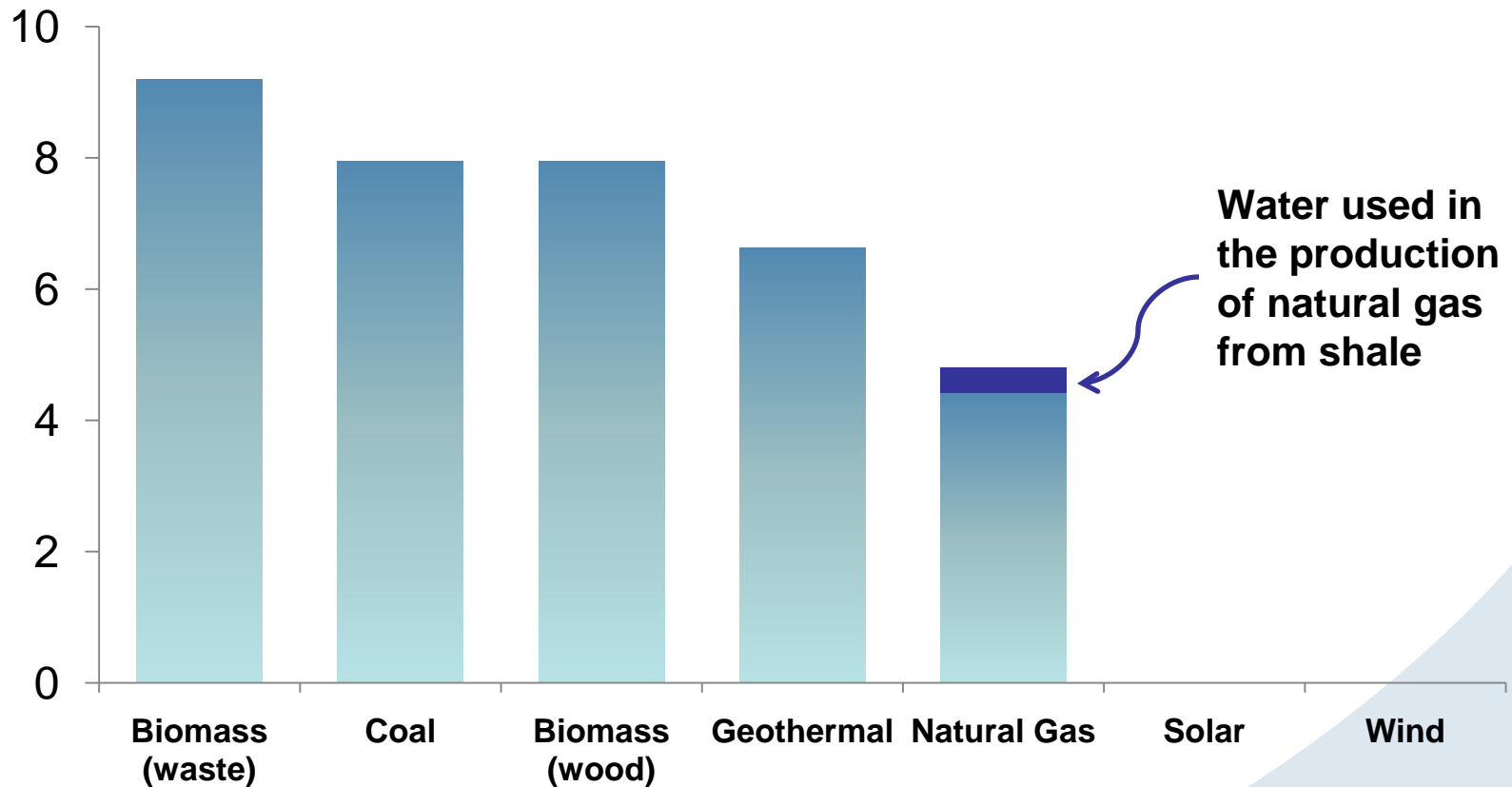
Government Oversight of Natural Gas Production

Regulated by states and under the following federal laws:

- Clean Water Act – surface water discharge, storm water runoff
- Clean Air Act – air emissions associated with processing equipment and engines
- Safe Drinking Water Act – underground injection disposal/reuse of produced water and flow-back fluids
- Federal Land Policy and Management Act – permitting for federal onshore resources
- Outer Continental Shelf Lands Act – permitting for federal offshore resources
- National Environmental Policy Act – permits and environmental impact statements
- Occupational Safety and Health Act – requires information about chemicals used at every site
- Emergency Planning and Community Right-to-Know Act – annual reporting to emergency responders of chemicals stored and used above certain quantities
- Extensive State Oversight – implement federal laws and regulate drilling fluids and produced water management
 - Detailed state regulatory information available at www.STRONGERInc.org

Natural Gas Water Use Lowest among Combustion Fuels

MM Gal/1000 Households

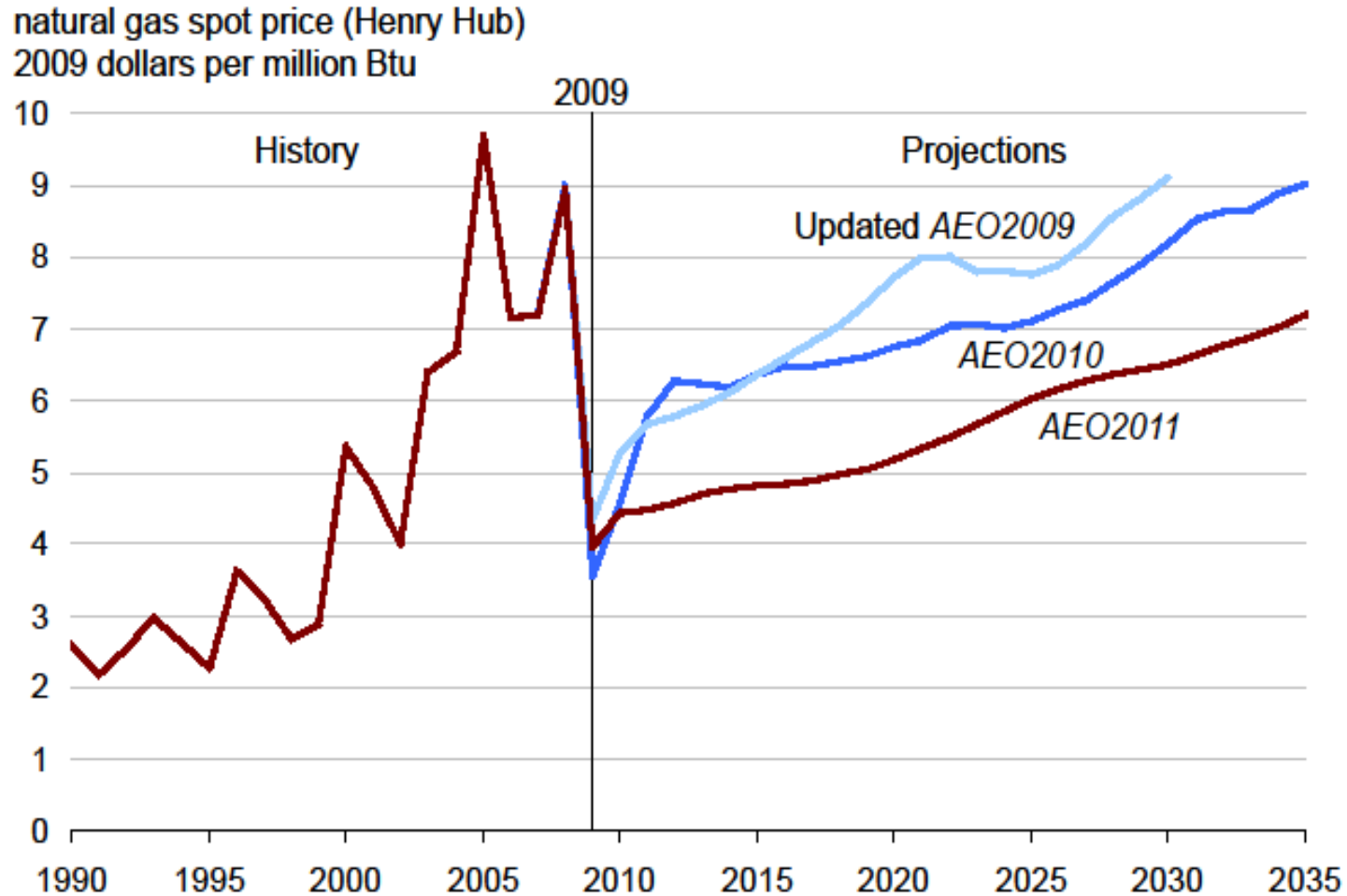


Water used in the production of natural gas from shale

Effect of EPA Clean Air Act Regs

- INGAA Analysis: Upcoming EPA regs likely to result in 15% coal plant shutdowns
 - Gas demand to increase roughly 3 Tcf/year to ~27 Tcf over next five years
 - U.S. Consumption: 20 to 24 Tcf in last five years with competitive prices
- Gas industry confident up and down value chain that it can meet power sector's future needs

As Supply Increases, Price Forecasts Have Dropped, With Henry Hub Now Forecast Under \$6.00 to Mid - 2020s



Source: EIA, Annual Energy Outlook 2011



Gas Industry Must Do Better

- Listening to and addressing community concerns
- Use of stringent industry and government standards on land reclamation, well construction, water management and pipeline safety
- Responsible hydraulic fracturing practices
- Minimizing surface effects on land and infrastructure
- Offshore safety and spill containment
- Gas Challenge: Address public perception of environmental concerns with hydraulic fracturing