



HYDRAULIC FRACTURING: Accessing Shale & Tight Gas

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Regional Discipline Leader

Production Technology

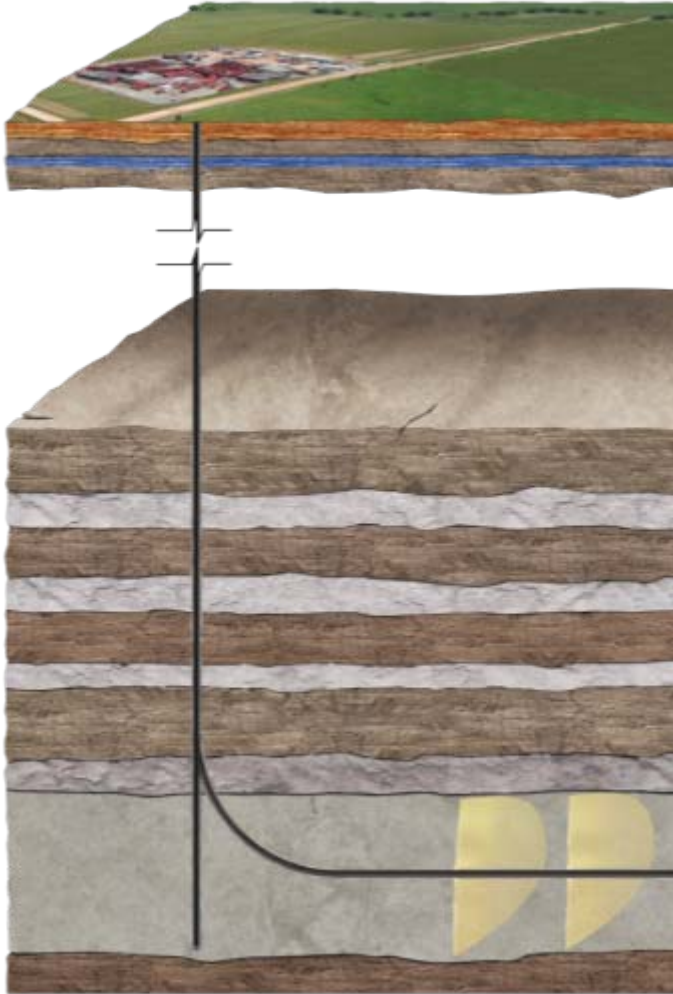
Shell Upstream Americas



DEFINITIONS AND CAUTIONARY NOTE

- Resources: Our use of the term “resources” in this announcement includes quantities of oil and gas not yet classified as Securities and Exchange Commission of the United States (“SEC”) proved oil and gas reserves or SEC proven mining reserves. Resources are consistent with the Society of Petroleum Engineers 2P and 2C definitions.
- The companies in which Royal Dutch Shell plc directly and indirectly owns investments are separate entities. In this announcement “Shell”, “Shell Group” and “Royal Dutch Shell” are sometimes used for convenience where references are made to Royal Dutch Shell plc and its subsidiaries in general. Likewise, the words “we”, “us” and “our” are also used to refer to subsidiaries in general or to those who work for them. These expressions are also used where no useful purpose is served by identifying the particular company or companies. “Subsidiaries”, “Shell subsidiaries” and “Shell companies” as used in this announcement refer to companies in which Shell either directly or indirectly has control, by having either a majority of the voting rights or the right to exercise a controlling influence. The companies in which Shell has significant influence but not control are referred to as “associated companies” or “associates” and companies in which Shell has joint control are referred to as “jointly controlled entities”. In this announcement, associates and jointly controlled entities are also referred to as “equity-accounted investments”. The term “Shell interest” is used for convenience to indicate the direct and/or indirect (for example, through our 23 per cent. shareholding in Woodside Petroleum Ltd.) ownership interest held by Shell in a venture, partnership or company, after exclusion of all third-party interest.
- This announcement contains forward looking statements concerning the financial condition, results of operations and businesses of Shell and the Shell Group. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management’s current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Shell and the Shell Group to market risks and statements expressing management’s expectations, beliefs, estimates, forecasts, projections and assumptions. These forward looking statements are identified by their use of terms and phrases such as “anticipate”, “believe”, “could”, “estimate”, “expect”, “goals”, “intend”, “may”, “objectives”, “outlook”, “plan”, “probably”, “project”, “risks”, “seek”, “should”, “target”, “will” and similar terms and phrases. There are a number of factors that could affect the future operations of Shell and the Shell Group and could cause those results to differ materially from those expressed in the forward looking statements included in this announcement, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell’s products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement for shared costs; and (m) changes in trading conditions. All forward looking statements contained in this announcement are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward looking statements. Additional factors that may affect future results are contained in Shell’s 20-F for the year ended 31 December 2011 (available at www.shell.com/investor and www.sec.gov). These factors also should be considered by the reader. Each forward looking statement speaks only as of the date of this announcement, **22 February 2012**. Neither Shell nor any of its subsidiaries nor the Shell Group undertake any obligation to publicly update or revise any forward looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward looking statements contained in this announcement.
- Shell may have used certain terms, such as resources, in this announcement that the SEC strictly prohibits Shell from including in its filings with the SEC. U.S. investors are urged to consider closely the disclosure in Shell’s Form 20-F, File No 1-32575, available on the SEC website www.sec.gov. You can also obtain these forms from the SEC by calling 1-800-SEC-0330.

What Is Hydraulic Fracturing?



- What is it?
 - Pump water-based fluids to create a pathway or 'crack' in the rock to connect to the wellbore
 - Place small granular solids (usually sand) into the pathway to provide that it remains open after the hydraulic pressure is removed
- Why do we use it?
 - Increase the rate at which the well is capable of producing oil or gas
 - Increase the economically recoverable reserves for a well
- How common is it?
 - Used since late 1940s
 - Over 1 million wells in U.S. alone

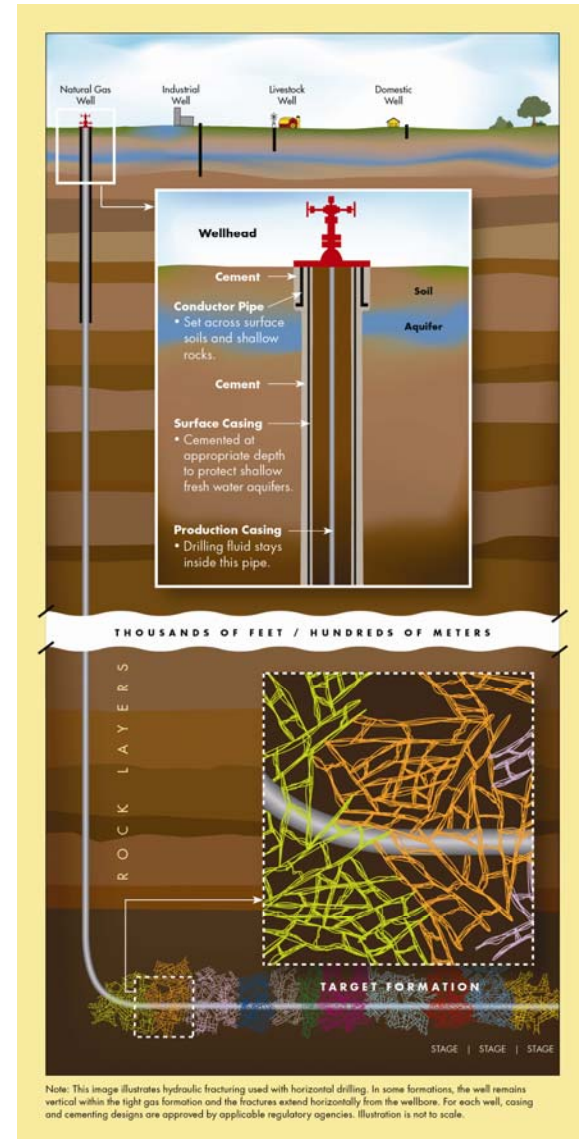
Pictures of Hydraulic Fractures in a Lab

- Typical Dimensions of a created hydraulic fracture
 - Width: Microns to 0.25 in.
 - Length: 500-2000 ft
 - Height: 20-400 ft



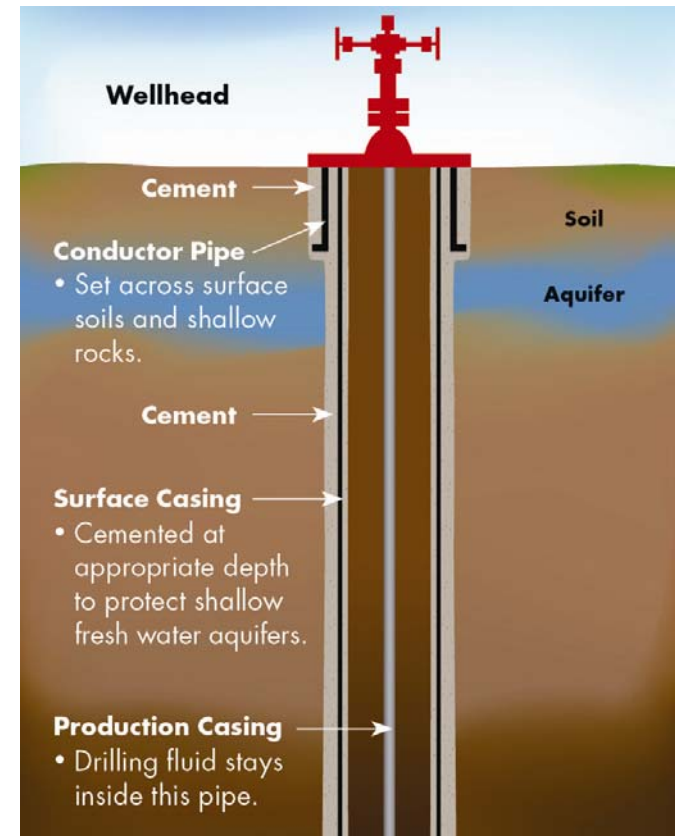
Well Planning

- Designed to isolate the fluids in the well and protect drinking water
- Locations are carefully selected and footprint is minimized
- Water reclamation/recycling
- Casing and cement tested to meet strict specifications based on global drilling standards
- Fractures are isolated from aquifers by thousands of feet of rock
- Fractures extend in to the rock over a limited interval in the subsurface



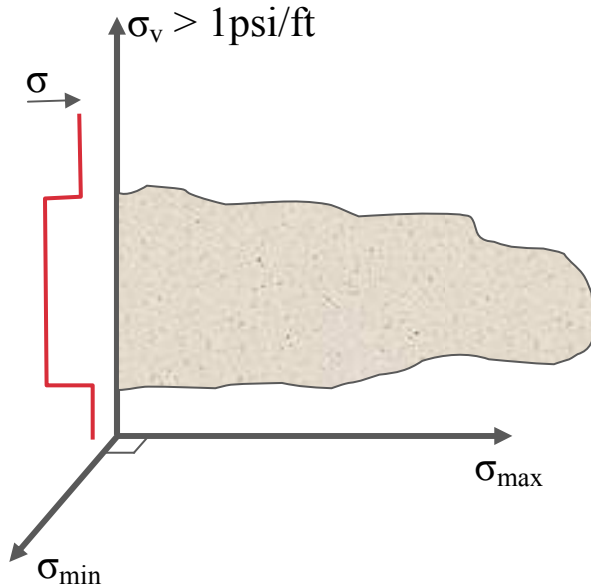
Well Integrity & Isolation

- Groundwater protected by a series of steel pipes sealed in place with cement running to below the level of potable water
- Pipes and cement are tested before drilling a new hole section
- Wellbore is tested for integrity before hydraulic fracturing
- Wells are monitored with pressure sensors throughout the life of the well to check for a firm seal

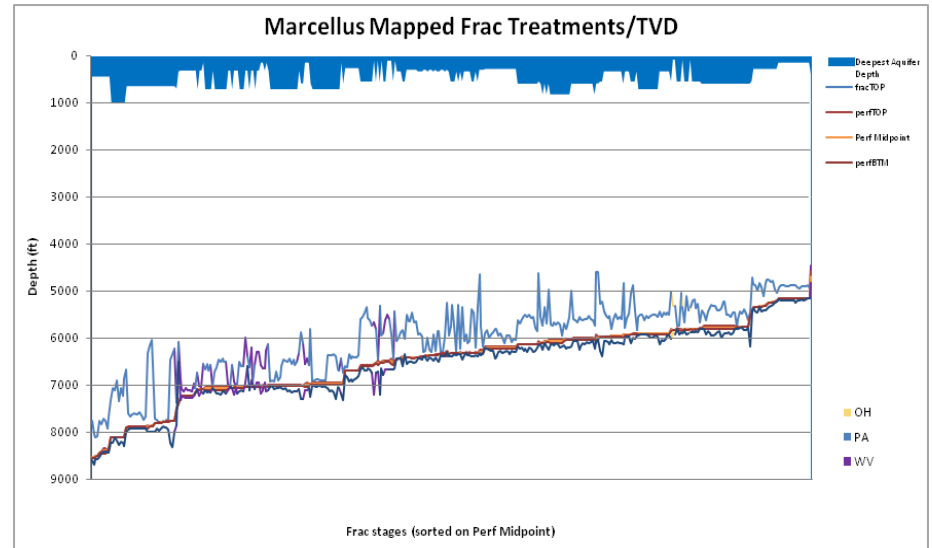


An Engineered Process

Hydraulic Fracturing Model



Microseismic Confirmation

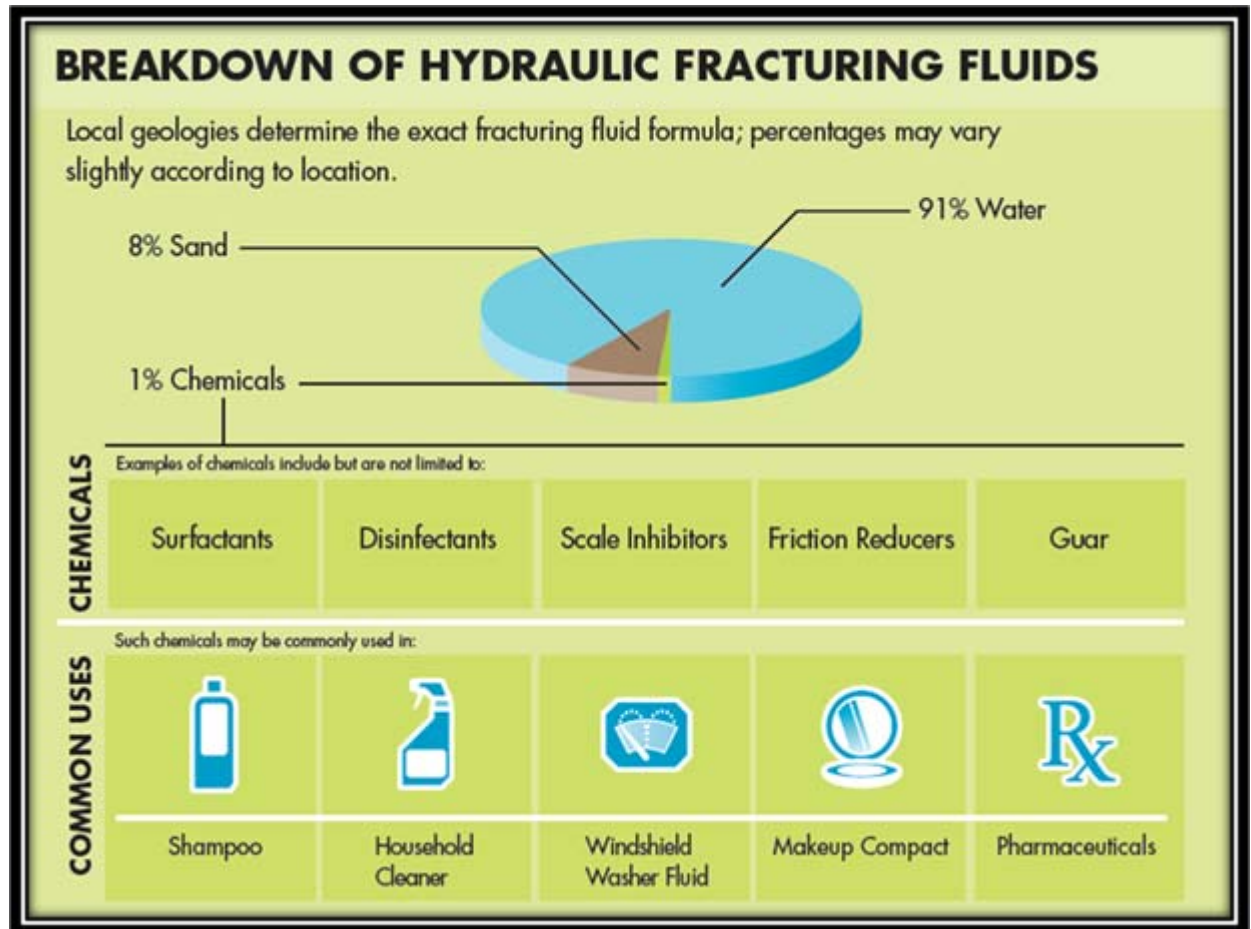


Kevin Fisher, "Data Confirm Safety of Well Fracturing" *The American Oil & Gas Reporter* – July 2010

$$\sigma_{\text{min}} = \left[\frac{\nu}{1-\nu} \right] \left[\sigma_z - \alpha_1 P_R \right] + \alpha_2 P_R + \sigma_{\text{Tec}}$$

Disclosure of Hydraulic Fracturing Fluids

■ www.fracfocus.org



Shell Onshore Tight Sand/Shale Oil & Gas Operating Principles



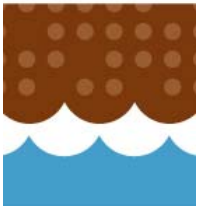
Safety & Well Integrity

Shell designs, constructs and operates wells and facilities in a safe and responsible way.



Footprint

Shell works to reduce its operational footprint.



Water

Shell conducts its operations to protect groundwater and reduce water use as reasonably practicable.



Community

Shell engages with local communities regarding socio-economic impacts that may arise from our operations.



Air

Shell conducts its operations in order to protect air quality and control its fugitive emissions.

