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Hydraulic Fracturing Process

Hydraulic fracturing is a process through which fluids under high pressure are injected to crack a rock so as to allow oil and gas to flow into the wellbore. Once the rock is fractured, proppant such as sand is injected to prop open the fractures to avoid sealing. During the process, water is used as a carrier fluid to transport the sand into the fractured rock matrix (Cabot Oil & Gas Corporation 4). The raw materials used for this process include sand and water, which make up 99 percent of the fluid used by Cabot. The other one percent is composed of chemical additives that help in reducing friction, preventing corrosion, as well as bacteria control. Once the gas or oil leaks out of the fracture, it flows to the surface under controlled conditions via the wellhead where it is collected for processing and distribution.

Sequence of Causal Events

Sequence of the causal event gives the logic of the process. It explains what factors cause what to happen in a manner that allows the audience to be able to draw a diagram at the end of the explanation. In this process, a perforating gun is lowered into the targeted position within the horizontal portion of the well. An electric current is then administered into the well setting of a small explosive charge (Cabot Oil & Gas Corporation 2). The charge creates small holes through the well casing into the shale formation. Water, sand and a few additives are pumped down the wellbore at a very high pressure. The sand will prop open the shale creating a pathway through which the gas will enter the wellbore and flow onto the well surface.

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The process takes place in stages where after each stage, a plug is set, and new perforations established to direct the frac fluid into the next stage.

Cabot Oil & Gas Corporation (3) posits that segmenting the well in stages causes a large amount of gas to be produced from the well. After the process is completed, all the plugs between frac stages are removed, and the well is opened up to remove the fracturing fluid. The gas will then start travelling up the well for harvesting. A flare is then set up to ensure that the gas is safely burned. Once on the surface, the gas is collected for processing and distribution for commercial or domestic purposes.

How to carry out the Process

- You lower a perforating gun into a targeted position in the horizontal position of the well
- You then transfer an electric current down the well to offset an explosive charge.
- After the electric transfer, you pump water, sand, and a few additives into the wellbore at a high pressure.
- Ensure you adjust and record all the stage parameters to enhance workplace health and safety for the workers.
- You should then set a plug to create new perforations that will direct the frac fluid to the subsequent stage.
- Ensure that you remove the plugs between frac stages after the process is over to remove the restriction in the wellbore.
- You then open up the well and safely remove the fracturing fluid to allow harvesting of natural gas.

- Once the gas reaches the surface of the well, you collect the gas for processing before it is distributed for us.

Significance of the Process

Hydraulic fracturing process is significant in various ways. Other than just being used in extracting oil and natural gas from rocks, the process is significant in the following manner (Cabot Oil & Gas Corporation 3):

- It is used to stimulate groundwater wells increasing the volume of water in wells
- It is used for electricity generation especially in geothermal systems

Work Cited

Cabot Oil & Gas Corporation. Exploring the Hydraulic Fracturing Process. (2010), Cabotog.

Web. 6 November, 2014.