

## 11.1: Probing Deep into the Geosphere - A Well Too Far?

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In 2009 the British petroleum exploration and development company, BP, reached a record depth for an oil well of 10,685 meters (35055 feet, 6.6 miles) below the ocean floor in the Gulf of Mexico not counting the 1,220 meters of water above the wellhead. This well is part of the Tiber Prospect oil field estimated to contain between 4 billion and 6 billion barrels of crude oil equivalent (including natural gas). This well illustrates the ability that humans have acquired to probe far into the geosphere where conditions are extreme with pressures that may reach 1,200 times atmospheric pressure and temperatures may exceed 135°C. At these depths and under these conditions it is indeed a different world than the one encountered by more conventional petroleum exploration.

In early 2010 BP was in the process of completing another deep well in the Gulf of Mexico about 66 km off the coast of Louisiana in 1500 meters of water using the Deepwater Horizon semi-submersible mobile offshore drilling unit. This marvel of modern well drilling technology was a massive floating dynamically-positioned unit kept in place precisely by the computerized operation of propulsion units. At 9:45 p.m. on April 20, 2010, highly pressurized methane gas overcame the containment devices on the well, burst through the top of the drill column, and spread over the drill rig causing a massive explosion and huge fire. Although most of the personnel on the rig were rescued, 11 workers were killed and their bodies were never found. After 36 hours of uncontrollable fire, the Deepwater Horizon rig sunk on the morning of April 22, 2010. Despite efforts to contain the flow, oil pressurized by natural gas continued to pour from the wellhead, spreading across large areas of the Gulf of Mexico resulting in arguably the most catastrophic environmental disaster of our time. Financial costs of this disaster have been in the billions of dollars (in June 2010 BP set aside a \$20 billion fund to pay claims resulting from the oil release) and damage to fisheries and coastal areas from the leaking petroleum have been immeasurable. The question can be raised whether this was “a well too deep,” a probing by humans too far into the depths of the geosphere, at least in consideration of the inadequate protective measures that had been taken?

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