

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

An International Geological Organization



Willard R. (Will) Green
President

June 23, 2008

The Honorable Nancy Pelosi
Speaker
U.S. House of Representatives
Washington, DC 20515

The Honorable Steny Hoyer
Majority Leader
U.S. House of Representatives
Washington, DC 20515

The Honorable John Boehner
Minority Leader
U.S. House of Representatives
Washington, DC 20515

Dear Speaker Pelosi, Majority Leader Hoyer, and Minority Leader Boehner:

Given the on-going debate about access and leasing activity on federal onshore lands and the Outer Continental Shelf, I would like to offer some perspective, on behalf of the American Association of Petroleum Geologists (AAPG), on the science and process of finding oil and natural gas.

AAPG, an international geoscience organization, is the world's largest professional geological society representing over 33,000 members. The purpose of AAPG is to advance the science of geology, foster scientific research, promote technology and advance the well-being of its members. With members in 116 countries, more than two-thirds of whom work and reside in the United States, AAPG serves as a voice for the shared interests of energy geologists and geophysicists in our profession worldwide.

AAPG strives to increase public awareness of the crucial role that the geosciences, and particularly petroleum and energy-related geology, play in our society.

Finding and developing oil and natural gas blends science, engineering, and economics. It has distinct phases: exploration, development, and production. And it is risky, because finding oil and natural gas traps, places where oil and natural gas migrate and concentrate, buried under thousands of feet of rock is like finding the proverbial needle in a haystack. Talent and technology increase our chances of a discovery, but there are no guarantees.

What is exploration? Well, the grid pattern on a block map makes it tempting to think of exploration as a process of simply drilling a well in each grid block to determine whether it contains oil. But because of the natural variation in regional geology, one cannot assume oil and natural gas are evenly distributed across a given lease or region. Rather, exploration is about unraveling the geologic history of the rock underneath that

grid block, trying to understand where oil or natural gas may have formed and where it migrated. If the geology isn't right, you won't find oil or natural gas.

Legendary geologist Wallace Pratt once observed, "Where oil is first found is in the minds of men." When preparing a lease bid, geologists use their knowledge to identify the specific areas in a region that they believe have the highest likelihood of containing oil and natural gas traps. Successful exploration begins with an idea – a hypothesis of where oil may be found.

Since exploration is about developing and testing ideas, some acreage available for leasing is never leased. That is because no one develops a compelling idea of why oil or natural gas should be there. Similarly, some acreage is leased and drilled repeatedly with no success. Then, one day, a geologist develops an idea that works, resulting in new oil or natural gas production from the same land that others dismissed as barren.

Once a lease is awarded, geologists begin an intensive assessment. They collect new geological, geophysical, and geochemical data to better understand the geology in their lease area. They use this data to construct a geological model that best explains where they think oil and natural gas were generated, where it may have been trapped, and whether the trap is big enough to warrant drilling.

If there is no evidence of a suitable trap, the explorer will relinquish the lease and walk away. If they see a trap that looks interesting, they schedule a drill rig to find out if they are right. Drilling is the true test of the geologists' model, and it isn't a decision to be made lightly. Drilling costs for a single well can range from \$0.5 million for shallow onshore wells to over \$25 million for tests in deep water offshore.

As the well is drilling, geologists continually collect and evaluate data to see whether it conforms to their expectations based on the geological model. Eventually, they reach the rock layer where they think the trap is located.

If there is no oil or natural gas when the drill reaches the trap they were targeting, they've drilled a dry hole. At this point the explorers will evaluate why the hole is dry: was there never oil and gas here; how was the geological model wrong; and can it be improved based on what they know from the drilled well? Depending on the results of this analysis, they may tweak the exploration idea and drill another well or decide the idea failed and relinquish the lease.

If there is oil and/or natural gas, they've drilled a discovery. Typically, they will test the well to see what volumes of oil and/or natural gas flow from it. Sometimes the flow rates do not justify further expenditures and the well is abandoned. If the results are promising, they will usually drill several additional wells to better define the size and shape of the trap. All of this data improves the geological model.

Based on this revised geological model, engineers plan how to develop the new field (e.g., number of production wells to drill, construction of oil field facilities and pipelines).

Using complex economic tools, they must decide whether the revenue from the oil and natural gas sales will exceed the past and continuing expenses to decide whether it is a commercial discovery.

The process of leasing, evaluating, drilling, and developing an oil or natural gas field typically takes five to ten years. Some fields come online sooner. Others are delayed by permitting or regulatory delays or constraints in the availability of data acquisition and drilling equipment and crews. Large projects and those in deep water may require a decade or more to ramp up to full production.

As you can see, oil and natural gas exploration is not simple and it is not easy. It requires geological ingenuity, advanced technologies, and the time to do the job right. It also requires access to areas where exploration ideas can be tested—the greater the number of areas available for exploration, the higher the chance of finding oil and natural gas traps.

U.S. consumers are burdened by high crude oil prices. Conservation and efficiency improvements are necessary responses, but equally important is increasing long-term supply from stable parts of the world, such as our very own federal lands and Outer Continental Shelf.

As Congress considers measures to deal with high crude oil prices, I urge caution. Policies that increase exploration costs, decrease the available time to properly evaluate leases, and restrict access to federal lands and the Outer Continental Shelf do not provide the American people with short-term relief from high prices and undermine the goal of increasing stable long-term supplies.

I am happy to further discuss these ideas. Please contact me through our Geoscience & Energy Office in Washington, D.C. at 202-684-8225 or 202-355-3415.

Sincerely,

A handwritten signature in cursive script that reads "Willard R. Green".

Willard R. (Will) Green
President

Cc: The Honorable Nick Rahall, Chairman, Committee on Natural Resources
The Honorable Don Young, Ranking Member, Committee on Natural Resources