

# Pemex and the Macondo Well

## Did the Accident Affect Its Agenda?

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British Petroleum's accident did not trigger changes in the activities or plans of *Petróleos Mexicanos* (Pemex), Mexico's state-owned oil company, for the rest of the present administration. To demonstrate this, I will start by saying that land and shallow water exploration have both been difficult. In the decade from 2001 to 2010, Pemex doubled its investments and drilled the same number of wells as it had sunk in the 1970s, at its zenith. But it has only found small, disperse deposits of heavy crude, in some cases more than 7,000 meters deep. In this context, we can be sure that the possibility of discovering a new gigantic deposit inside Mexico or in shallow waters can be discarded. Deep waters are the last hope for slowing the decline in production and maintaining income from exports.

### RESULTS IN THE DEEP GULF

Up until now, 18 wells have been drilled and two are underway. The success rate, an indicator measuring the ratio of successful wells to wells drilled, has been 38 percent. That is, 11 have been failures and seven have hit new deposits.

On the other hand, two new hydrocarbon basins have been discovered: one that produces natural gas off the coast of Catemaco in southern Veracruz, and another that produces super-heavy oils off the coast of Campeche. It is ironic that, given the hurry to raise exports and maintain fiscal revenues, geology provides us with gas, but enormous investments are required to process and transport it. Also, we have super-heavy crudes, but we face the challenge of creating new technologies for its extraction and industrialization. In addition, few reserves have been discovered, with the exception of Lakach, a gigantic field in the area of Catemaco, Veracruz. In short, until now, geology has not been the splendid

provider promised in the discourse that pointed to the existence of a "treasure" in the bowels of the Earth. However, the predictions that we would find no hydrocarbons at all also turned out to be false. See the table for a summary of the results.

We can disregard the Nab well because, according to a study published as a master's thesis by Mexican engineer Omar Romero Mata at Stavanger University in Norway, the technology does not currently exist to be able to extract its 8- to 10-degree API crudes. According to Romero, if it were programmed for development, "Nab' [would be] one of the most challenging fields in the world....No historical reference exists for a commercial development for this depth and fluid properties."<sup>1</sup>

In the two remaining years of this administration, 2011 and 2012, Pemex's plan is to continue to simultaneously operate three deep-water platforms in the Gulf of Mexico, among them the Centenario, which, at the time of this writing, continued drilling the Pikkis Well, located in the Catemaco area and at a greater depth than Macondo. Work there will conclude in 2011, and work on Nen, Kunán, Kabilil, and Kajkunaj will follow. Pemex has more than 100 prospective sites in this area. The second team in Mexican waters will be Sea Dragon; its contract was confirmed by Pemex's director at the recent oil congress in October 2010. Its vast program will cover the entire Gulf coast, from Tamaulipas to the Campeche coast, drilling in virgin areas.

The third platform is called Bicentenario. It will move into Mexican territorial waters at some time in 2011, since it is already slightly behind schedule. It is the first team designed for wells 3 000 meters under water. In 2010, at the moment of greatest alarm about the Macondo accident, perhaps waiting for the new U.S. regulations that began to be designed at that time, Pemex announced a change in its programs: Bicentenario would not begin operations directly in border areas with the United States, but would operate across from the port of Tuxpan, Veracruz, "while the crew became familiarized with

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the equipment.” The priority is now “the search for best practices in deep waters,” according to Dr. Juan Carlos Zepeda Molina, commissioner and president of the National Hydrocarbons Commission, the new regulatory body.<sup>2</sup>

Discoveries about the geology of the gulf have made it possible to pinpoint three areas to concentrate activity, two already mentioned here: Catemaco, a new wet gas basin in Mexico’s oil geography, and the super-heavy area off Campeche. Geologists who have studied this region for decades like Dr. Salvador Ortuño Arzate have dubbed it the Kayab Area.

Finally, the third zone, bordering on the United States, is called Perdido Fold Belt. Mexico has been studying it for more than 10 years and has held five diplomatic meetings seeking a new treaty to jointly explore the transborder deposits thought to exist there. The U.S. government response can be summed up in the position that the first requirement for initiating negotiations has to be the demonstration that there is at least one deposit spanning the border. Once that has been proven, the next step would be to determine which parts of it are on either side of the border and what percentage of the hydrocarbons there belong to each country. However, this can only be determined by drilling wells; it is not possible to negotiate blindly using hypotheses based on geophysical soundings. In the late 1990s, the National Autonomous University of Mexico’s Institute for Economic Research launched a seminar to examine these problems. Among its proposals is to begin drilling on the Mexican side near U.S.

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wells in this Gulf of Mexico border region. Our proposals were supported when Dr. Sergio Alcocer Martínez de Castro, then the director of the UNAM Engineering Institute, asked about why the move into deep waters, explained, “Because the United States is already there.”<sup>3</sup>

After years of waiting, the Bicentenario platform is now due to arrive, and is slated to drill the first well on the Mexican side of the border with privately-owned Mexican equipment. We estimate that drilling will begin in the Perdido Fold Belt in the second half of 2011 and will take five years, since it is earmarked exclusively for this promising region. There are very high probabilities for success in the area. In the United States, out of 19 exploratory wells, 12 hit hydrocarbons: that is, there was a 63 percent success rate.<sup>4</sup> By analogy, we hope to get similar results: these are the same geological layers, the same structures. Why can’t we expect similar results?

It is also possible we could find giant fields like the Great White, but geology has the last word. Despite the advance of technology, no well can offer a 100-percent guarantee. In

## RESULTS FOR 20 WELLS DRILLED BY PEMEX

Well	Year	Result	Volume of Crude and/or Gas
Chukta-201	2004	Dry hole	—
Nab-1	2004	Only possible reserves of extra-heavy crude reported	32 million barrels
Caxui	2004	Dry hole	—
Kastelán	2005	Only possible reserves of extra-heavy crude reported	43 million barrels
Noxal-1	2006	Only possible gas reserves reported	420 billion cubic feet
Lakach-1	2006	The only one with proven gas reserves	308 billion cubic feet
Lalail	2007	Only probable and possible gas reserves reported	709 billion cubic feet
Chelem-1	2008	Dry hole	—
Tamha-1	2008	Immature organic matter	—
Tamil-1	2008	Only traces found	n/d
Leek-1	2009	Only possible gas reserves reported	112 billion cubic feet
Catamat-1	2009	Only water	—
Etbakel	2009	Traces of crude. Non-productive	—
Cox	2009	Dry hole	—
Holok-1	2009	Only water	—
Kabilil	2009	Dry hole	—
Labay	2009	Possible reserves of natural gas	2.4 trillion cubic feet
Lakach delimitador	2010	Evaluation of its gas reserves pending	Production tests: 25 000 cubic feet/day
Piklis	2010	Drilling since August 2010	n/d
Bakale (tamil dl)	2010	Drilling since July 2010	n/d

Source: Pemex, *Las reservas de hidrocarburos de México (2005-2008)*, <http://www.pemex.com>.

this region, Chevron has drilled a dry well, the Toledo, only 9 kilometers from other successful wells.

#### THE TRIDENT CASE

The first Trident well on the U.S. side was announced as a supplier of light crude in 2001. The next year, two other Trident wells were drilled, one only four kilometers from the Mexican border. With this data, the press, research institutions, and oil companies considered Trident a transborder field. To prove whether this structure was productive on the Mexican

side, since the Ernesto Zedillo administration (1994-2000), Pemex has been studying a locale called Alaminos, five kilometers across from the Trident. A first successful Mexican-drilled well would be sufficient to sign new diplomatic agreements on “unified” pumping of the site. However, the whims of geology have changed some forms and rhythms of the Mexico-U.S. relationship.

What has happened? Information is incomplete, but we have some important pieces of the puzzle. The United States has given out information in small doses and only after a long delay: it has published the fact that the lease of the blocks where the Trident wells are located (that is, numbers 903,

904, and 947 in the Alaminos Canyon area in the U.S. sector of the Gulf of Mexico operated by Chevron) was “let go” and returned to the U.S. government in 2008. That is, after a decade, the report is that it is a “non-commercial” deposit with no reserves, where only “resources” have been recognized. The return occurred in 2008, at the end of the period U.S. legislation establishes for offshore leases in its waters.

Information now public in the United States also tells us that Blocks 903, 904, and 947 in the Alaminos Canyon area were included in Lease Sale 210 in August 2009.<sup>5</sup> Today, we also know that the blocks were given in exchange for a few million dollars to a small Norwegian firm called Rocksource Gulf of Mexico. The company’s website reports that it not only acquired the Trident rights, but also a group of nine blocks; it also includes a short history of Trident, explaining the return of the leases, and repeating that the crude “discovered” in Trident can only be evaluated as a “resource,”<sup>6</sup> that is, not as a reserve, and announcing that it will do its own estimate sometime in the future.<sup>7</sup>

As a result, the Mexican government reformulated its plan for partnering with large oil companies. It hoped to resolve the financing problems associated with the majors in a “unified” development of the transborder deposits. As became abundantly clear in the 2008 debate on the energy reform, without huge investments, Pemex’s entire deepwater program is unviable.

The search for new forms of partnership probably began in 2009, when the director of Pemex Exploración y Producción proposed at the Offshore Technology Conference that any Mexican crude discovered near the border be transported directly to Houston, using the transportation installations built only 14 kilometers away for Chevron, British Petroleum, and Shell’s Great White project.<sup>8</sup> Probably that proposal will be combined with the so-called “contracts with incentives.”<sup>9</sup>

Positive Mexican results in the Perdido area will prompt an immediate change in Pemex’s entire program. Drilling would immediately concentrate in this area near the U.S. border. The relationship of forces among Pemex, the governors of the Gulf coast states involved, and, of course, national and foreign oil companies leading the debate about Pemex’s deepwater programs would be reconfigured.

In the remotely possible case that in 2011 and 2012, Pemex faces consecutive failures in the Perdido region, panic will set in. Just drilling a well in this region costs Pemex more than US\$150 million. If these debts mount up, sources of credit

will shut down, though the flow of dollars from imports could remain constant for this administration and part of the next. The majors will change their policy toward Mexico; the ongoing courting that we have witnessed will become disdain; and only small companies willing to run very high risks will continue to be interested in the country, as international experience has shown.

In short, although Mexico has now been added to the long list of countries that are post-peak-oil, it can continue to play some role in energy supply, and oil will continue to be a factor in Mexico-U.S. relations. ■■■

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## NOTES

<sup>1</sup> Omar Romero Mata, “Model for Economical Analysis of Oil and Gas Deepwater Production Concepts/Comparisons of Life Cycle Cost of Subsea Production Systems vs. Floating Structures with Dry Wellheads,” master’s thesis, University of Stavanger, spring semester, 2010, <http://ingenet.com.mx/aguasprofundas/2010/07/04/estrategia-para-el-desarrollo-de-campos-en-aguas-profundas-en-mexico/>.

<sup>2</sup> “Estamos preocupados por cuestiones de seguridad, dice funcionario. Postpone Pemex perforación de pozo ultraprofundo en el Golfo de México,” *La Jornada* (Mexico City), August 7, 2010, p. 23.

<sup>3</sup> Sergio Alcocer Martínez de Castro, “Retos tecnológicos en aguas profundas. Fortalezas en institutos e instituciones de educación superior,” paper presented at the Encuentro Tecnológico Internacional sobre los Recursos Energéticos del Golfo de México, held in 2008 at the UNAM School of Engineering.

<sup>4</sup> Don Lyle, “Operators Stretch the Limits,” *E&P*, <http://www.epmag.com/archives/print/364.htm>, accessed April 3, 2007.

<sup>5</sup> See [http://www.gomr.mms.gov/homepg/lseale/210\\_active\\_lease.pdf](http://www.gomr.mms.gov/homepg/lseale/210_active_lease.pdf), accessed May 23, 2010.

<sup>6</sup> In oil industry jargon, the term “resource” means that only favorable indicators were found, but because of their high level of uncertainty, they require more investigation; that is, what has been found does not yet merit being elevated to the category of proven, probable, or possible reserves.

<sup>7</sup> “Rocksource ASA announces that the company, through its subsidiary Rocksource Gulf of Mexico Corporation (RGOM), has been awarded nine leases in the Western Gulf of Mexico Lease Sale 210... Unocal merged with Chevron in 2005, and in 2008 the operator Chevron returned the leases at the expiry of the primary lease term... In addition, the awards include the Trident discovery, which the previous operator (Unocal/Chevron) estimated to contain in excess of 100 million barrels of discovered resources. Rocksource will release its own resource estimate upon further evaluation.” <http://www.rocksource.com/archive/rocksource-awarded-9-gulf-of-mexico-leases-article182-170.html>, accessed May 2, 2010.

<sup>8</sup> He said, “Mexico also needs international help... A shortage of pipelines in deep Mexican waters could mean, for example, that the Mexican side of the U. S. Perdido prospect might flow to market through U.S. pipes if the two countries agree.” Bruce Nichols, “Mexico Hurries Deep Gulf Oil, Gas Search,” *Reuters*, Houston, May 6, 2009.

<sup>9</sup> In the energy reform approved two years ago by Mexico’s Congress, a new legal term, “contracts with incentives,” was introduced. These contracts allow private companies to do work for Pemex in areas of exploration and production reserved by the Constitution to the government. The companies are paid for this work, with the incentive of increasing their pay if they surpass targets established in the contract.