



Thomas VOYTOVICH

**A**s Egypt's largest acreage holder, most active driller and biggest producer of liquid hydrocarbons and natural gas, Apache truly deserves its enviable reputation in the country. Present in Egypt for 15 years, the American oil and gas pioneers have recently seen unprecedented success in some of the harshest drilling environments on earth.

**The Oil & Gas Year:** *Apache is a mainstay of the Egyptian exploration scene. What position does Egypt have within your global operations? And as the recently installed country head, how do you plan on enhancing it?*

**Thomas Voytovich:** In the early 1990s Apache turned its attention to the international arena. During our search, Egypt stood out as it was ideally suited to our operating style, focused as we are on efficiency and the application of new technology. It also provided a wide range of opportunities that, at that time, had little appeal to other international operators. In 1994 Apache acquired a 25 percent non-operating interest in Qarun Petroleum Company, creating the nucleus for a new core area that became a dominant component of our corporate portfolio.

In the fifteen years that we have been here, Apache has leveraged the skills we developed in North America, while adding some new ideas along the way. We currently hold over 11 million gross acres, roughly a third of all prospective acreage in the Western Desert. We have spent a great deal of money exploring and developing the area, including blanketing a significant portion of our concession holdings with high-quality 3D seismic mapping. As a result, we have learned a lot about our acreage and have improved our seismic acquisition, processing and interpretation skills. Testing our seismic interpretations with the drill bit has given us the chance to improve our understanding of both the habit of traps in the Western Desert and the way that we interpret those traps.

In 2008, Apache Egypt accounted for 21 percent of the company's global production revenue. We completed 215 of 238 wells drilled during the year and achieved record daily production in the first quarter of 2009 of over 161,000 barrels of oil per day (bopd) of gross oil and condensate and daily gross gas production of nearly 685 million cubic feet per day.

## The cutting edge

TOGY talks to

**Thomas VOYTOVICH,**  
Vice-President and General Manager  
**APACHE EGYPT COMPANIES**

**TOGY:** *As one of the oldest oil-producing countries in the world, production decline is inevitable. Apache, however, continues to defy expectations with a raft of new discoveries during 2008 and 2009. Can Egypt's declining production be stabilized by exploration mavericks such as Apache?*

**TV:** The decline curve is a very powerful thing, no matter where you operate, and reversing it in Egypt would be a lofty goal for us. As for Egypt being a mature province, we are making meaningful new discoveries in areas that have not seen much exploration activity in the past. Finding new reserves in these concession areas, uncovering new trap styles and discovering commercial accumulations in deeper zones beneath existing production does not sound like a mature province to me at all. Most of my experience comes from working in an area of the US that has been producing for nearly 100 years. Compared to that, Egypt looks like a wide-open frontier.

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**TOGY:** *Between your two major joint venture companies, Qarun and Khalda, you have 23 concession areas under your tenure. Could you outline those joint ventures and describe how you plan to keep production up in the years ahead?*

**TV:** Apache is the largest producer in the Western desert and the third-largest producer in Egypt. Of the 23 concession areas operated by Qarun and Khalda, 19 are producing and four are in the exploration phase with ongoing seismic studies and early exploratory drilling.

Apache has used its expertise to move into as yet underexplored parts of the country, and Egyptian operations currently account for 21 percent of production revenue

Qarun is an oil-producing joint venture and most recently we have been focusing on development drilling and infrastructure for the implementation of water flooding. Current daily production is approximately 46,000 bopd, 90 percent of which comes from long-life water flood fields. Over the last two years water injection has doubled year on year, with daily water injection currently at 60,000 barrels of water per day and increasing. Due to the aggressive development activities undertaken by Apache and the Qarun Petroleum Company, production from Qarun's fields has risen to rates unseen since the mid-1990s.

Khalda is a much larger geographical area. This affords us a different set of opportunities and our operations are spread out over a number of geological features in the northern Western Desert. Although water flooding contributes to production in Khalda's operating area, the primary focus of our operations is deeper structures, delineated by 3D seismic surveys.

So far, seismic work has disclosed multiple objective formations in the Khalda area, with identified leads and prospects typically comprised of small to mid-sized structural features with stacked pays. Although the density of identified structures varies across the region, we do characterise the Western Desert as an area of great potential.

**TOGY:** *Your most recent June 2009 discovery, Phiops-5, is part of a series in the Western Desert's Faghur Basin. How important is the Faghur Basin to your Khalda operation and to what do you attribute such a successful run of discoveries?*

**TV:** Obviously, the success we have had is driven by the Apache team members, their aggregate experience and their collective effort. The Faghur Basin operation was started when Apache signed the West Kalabsha Concession in 2005. Soon afterwards we drilled the Alam El

Bueib (AEB) Faghur-1X discovery in 2006 and then the Jurassic WKAL-A discovery in 2008. The Phiops discovery in early 2009 on nearby Khalda acreage has elevated our confidence in the Faghur Basin and builds on our previous successes in the area. The basin is proving to be a prolific oil producer and we already have three additional wells moving towards production, with plans in place for additional development and exploration drilling in the near future.

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The Phiops-1X exploration well on the Kalabsha development lease logged 52 metres of oil pay in the Cretaceous AEB sand, and 31 metres of pay in the Jurassic Safa sands. This new field discovery was completed in the Jurassic Safa and started production in April of this year. Phiops-5 was immediately drilled to appraise the AEB sands and encountered 74 metres of net oil pay within a much longer oil column. The testing of a 22-metre interval in this column resulted in one of the highest onshore test rates ever recorded in Egypt yielding almost 8,300 bopd. Production commenced in June and the well is currently flowing at a restricted rate of approximately 5,000 bpd, pending completion of additional facilities to handle the newly increased production rates.

**TOGY:** *Operating in one of the remotest spots on earth, your Western Desert oil has to travel some distance to reach its destination. What infrastruc-*

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*ture do you have in place there and how are you adapting it to cope with the series of new discoveries?*

**TV:** Indeed we have completed some significant infrastructure projects that allow us to get our products to market. We have recently expanded our Salam Gas Plant in the Western Desert where the facility now has four gas trains to extract liquids and allows us to process over 400 million cubic feet per day.

We have also completed the Northern Pipeline Compression Project that will boost pressure in the main trunk line back to the Western Desert gas complex. That project alone increased the pipeline's capacity from around 19.82 million cubic metres (700 million cubic feet) per day to nearly 28 million cubic metres (1 billion cubic feet) per day, allowing us to move our gas. While neither of these projects are running at full capacity yet, we have already seen a significant bump in our production volumes.

We are currently delivering around 720 million cubic feet of gas out of Khalda into the national grid, along with 110,000 barrels of oil and condensate per day. Overall, our production is increasing rapidly, despite the remoteness of the Western Desert. As drilling activity continues and additional production capacity is developed, additional infrastructure projects will be needed to increase takeaway capacity and efficiency in gathering and transporting the products to market.

**TOGY:** *With such a huge area under your tenure, where are you looking to focus your exploration efforts in the short term?*

**TV:** The same types of traps that we have encountered in the Phiops area are present across much of the Western Desert. The traps appear to be oil prone in the Faghur and Abu Gharadig Basins, and tend more toward gas and gas condensate to the north near Matruh. We will continue to expand our operations across all of the concession areas, although the oil rich area of the Faghur and Abu Gharadig Basins are likely to see increased levels of activity in the near term.

**TOGY:** *With experience on some of the oldest producing fields in the US, how does the level of technological implementation differ in Egypt?*

**TV:** Much of the exploration and production methods that we are currently employing in Egypt are tried and tested in the US. We have worked with some of these technologies for a long time, largely because the rock formations in the US are of lower quality and require significant stimulation and artificial lift to be commercial. By comparison, the formations in Egypt are very good. The same technology applied here delivers profound results.

We have introduced the large-scale implementation of several production methods to Egypt, processes that are standard practice for us in the US. For example, artificial lift was not the norm when we arrived here and since our arrival we have introduced rod pumps and electric submersible pumps to increase fluid withdrawal from low energy wells. This effort has resulted in significant increases in production from many fields.

Fracture stimulation is a technology that we have expertise in and have successfully transferred to Egypt. Apache has stimulated thousands of wells in North America in this way, and delivering this technology to Egypt has provided a change in both our operating style and our production performance.

Enhanced recovery through water flooding is another technology that we have brought from the US. The secret to successful water flooding is to be able to accurately and cost-effectively move water from one place to another, whether on the surface or in the subsurface.

The Western Desert has historically been considered a very difficult seismic area. Due to our 3D seismic programmes, over the last decade we have largely overcome these difficulties and as a result have had a huge impact on the re-

*Enhanced oil recovery techniques has allowed Apache to increase its production in a number of fields*



sults we obtained in the Western Desert. When we look at seismic data acquired recently and compare it to what we were working with 10 years ago, the difference is astounding - it looks like a different area entirely.

With the seismic programmes we have undertaken, we not only continue to improve the quality of the seismic data, but also our ability to interpret that data. Many of our seismic methods have been exported to other Apache regions around the world.

These four factors have been the foundation upon which Apache has built its success in Egypt, and account for the better part of the near doubling of Apache's production rates in the last four years.

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**TOGY:** *In early 2009 Apache suffered a two billion US dollar asset write down. How significant was this in relation to overall company profitability and will there be a knock-on effect for your Egyptian operations?*

**TV:** Apache revisited its budget and the decision was made in late 2008 to stay within cash flow for 2009. Fortunately, oil prices have rebounded a bit and given us some breathing room. In comparison, in 2008, Apache drilled 230 wells in Egypt and in 2009 we are going to drill approximately 170. So despite a reduction in capital, we will still have had a very active 2009 drilling campaign and will finish the year as the most active driller in Egypt.

Historically, Apache has done very well during economic downturns. We expect that the current economic and financial conditions will present opportunities for Apache, not only in Egypt, both elsewhere in the world.

**TOGY:** *Where do you want to take Apache in five years time?*

**TV:** In five years I expect that Apache will have an even larger presence in Egypt. We will remain focused on the Western Desert, and although we will look at all opportunities in Egypt that present themselves, I expect that we will remain heavily weighted in the Western Desert.

Apache has enjoyed tremendous success in Egypt, and both Apache and Egypt are the beneficiaries of that success. We plan to be in Egypt for a long time.

