



The premier provider of reservoir valuation, characterization, and analytics to the oil and gas industry.

NUTECH Energy Alliance, Ltd. provides reservoir characterization services (including petrophysical, engineering, geological, and core analysis services) to the oil and gas industry. NUTECH provides a range of reservoir solutions from single well analysis to full-field development. Solutions are provided from initial exploration through asset divestiture.

RESERVOIR INTELLIGENCE

EXPERTISE

REGIONAL STUDIES

ABOUT US

NUTECH Secures multi-million-dollar contract with Tatweer

BAHRAIN

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UPSTREAM OIL & GAS

Bahrain Eyes Unconventional Oil For Economic Reboot

Long dependent on Saudi largesse, Bahrain has discovered major unconventional oil and gas reserves off its western coast. The GCC's smallest producer plans further development wells in 2018 as it seeks to emerge as the region's unlikely shale pioneer.

Bahrain on 1 April announced the end-2017 discovery of "a new light oil and deep gas reserve in the Khaleej Al Bahrain Basin" off its west coast (see msp). Analysis of the discovery has been conducted by Dallas-based DeGolyer and MacNaughton. State news agency BNA says the reserves "dwarf Bahrain's current reserves," although that's a very low bar. Energy Minister Shaikh Muhammad Al Khalifa says the discovery has some 80bn barrels oil in place and 13.7tcf gas in place. These are huge figures, but only a fraction will end up being classified as recoverable reserves once further appraisal work has been carried out. Nevertheless, it looks inevitable that Bahrain's reserves are set for a dramatic upgrade. BP's statistical review put Bahrain's end-2016 gas reserves at 5.8tcf, while Eni's World Oil Review pegged oil reserves at 129mm barrels. By contrast Yemen, which has the next smallest reserves in the Gulf, has exponentially more oil, 3bn barrels, and 50% more gas, around 9tcf.

PIONEER PAST, AND FUTURE?

Having kicked-started Gulf oil production with first oil from the Awali (Bahrain) field in 1932, Manama has since been left far behind. It's hoping to once again be a regional pioneer with the first offshore unconventional output. Bahrain hopes to be able to bring oil and gas volumes online within five years. This appears a viable timeframe.

US oilfield services firm Halliburton has committed to drilling two further appraisal wells on the discovery in 2018. The complex, and pioneering, nature of developing the new discovery through

coast with "potentially significant implications for the Kingdom's hydrocarbon reserves." The tests, in the former-Block 4 license relinquished by US-firm Oxy in 2012, showed light 43°A PI oil from Hanifa-Tuwaiq Mountain source rock. Bapco's 2014 report said it had engaged "a US-based consultant" in appraisal onshore and offshore unconventional plays. Then in September 2017, Bapco awarded US-firm Nutech Energy a contract to "evaluate, forecast and optimize the completion and stimulation of Bapco's first unconventional offshore well with lateral drilling

Drilling says it has three rigs in Bahrain.

FALTERING CONVENTIONAL OUTPUT

Awali output peaked at 79,000 b/d in 1970 but had fallen to 48,500 b/d in 2016 and an estimated average of 45,000 b/d for 2017. Awali is operated by Tatweer Petroleum, which has been a wholly owned subsidiary of Bapco since Oxy and UAE state-partner Mubadala walked away on 1 July 2016 (MEES, 10 June 2016). Alongside this upshove, Bahrain's commitment to the Opec's production cuts in force since January 2016 is another potential reason

The map illustrates Bahrain's oil infrastructure, highlighting the Khaleej Al-Bahrain Basin and the Abu Safah oil field. It also shows the location of the former Block 4 license area and the Awali field. The map includes labels for various oil fields, processing plants, and terminals, as well as infrastructure like pipelines and gas fields. The map also shows the location of Bahrain relative to Saudi Arabia and Qatar.

Source: [Mees.com](http://mees.com) Weekly Energy, Economic & Geopolitical Outlook Vol. 16. No. 14 06.April.2018

Tatweer has awarded NUTECH a multi-million-dollar contract after appraisal and review of unconventional resources. In September 2017, Tatweer contracted NUTECH to "evaluate, forecast and optimize the completion and stimulation of BAPCO's first unconventional offshore well with lateral drilling and multi-stage proppant fracking". NUTECH CEO Steve Roth held talks with the Minister of Energy and the CEO of Tatweer in April 2018, reviewing the study and finalizing the 3-year contract. State News agency BNA says the reserves "dwarf Bahrain's current reserves." Energy Minister Shaikh Muhammad Al Khalifa says the discovery has some 80bn barrels oil in place and 13.7tcf gas in place. The April meeting identified eight projects that will involve several of NUTECH's business units. These projects will characterize the reservoirs, including identifying natural fractures, build 3D geomodels, history match production, optimize and forecast future production and estimate single well economics and overall asset value. [NUTECH](http://mees.com) is a premier global provider of reservoir evaluation, characterization, and analytics to the oil and gas industry. See "[Bahrain Eyes Unconventional Oil for Economic Reboot](http://mees.com)" for more information.

FROM THE DESK *of*

Greg Jackson, NUTECH's VP, Reservoir Engineering

NUTECH Energy Alliance has been an industry recognized name in unconventional resources for over 10 years. Our experience includes every US unconventional basin plus we have analyzed unconventional basins in Canada, Mexico, the UK, the Netherlands, Poland, Argentina, Pakistan, and Bahrain. That global footprint is continuing to grow in a big way in 2018 and beyond.

Bahrain recently announced an 80 billion barrel unconventional resource discovery. Bahrain's current reserve base is estimated at 125 million barrels, comparable with Cuba, per the CIA World Factbook. If only 10% of the resource is recoverable, that would yield a greater than 6000% increase in their reserves generating critical revenue and investment for decades to come.

To date, only one producing well exists with two more to be added this summer in the Hanifa and Tuwaiq Mountain formations. As such, Bahrain needs to refine the full potential of the resource over the coming years to maximize the impact of such a discovery for their people and economy. One piece of this refinement has been sought via NUTECH.

NUTECH has entered into an extended contract with Tatweer Petroleum to provide reservoir characterization, completion engineering, geologic and reservoir modeling, as well as resource development. We are very excited to bring our wealth of geologic and engineering experience to assist Bahrain in this new and exciting time in their energy industry.

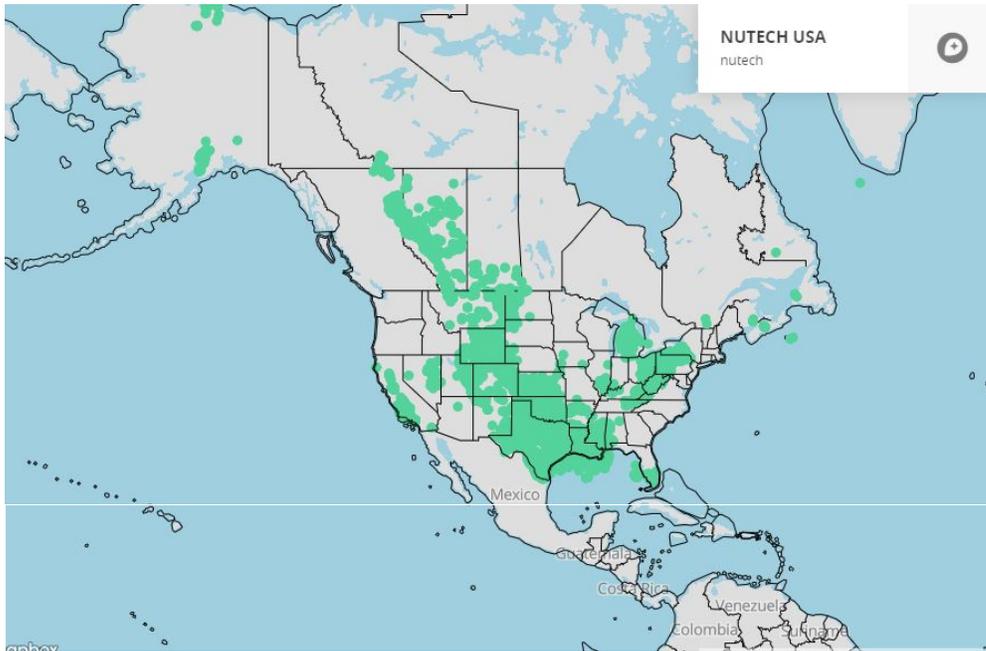
Your Success Is Our Goal



NUTECH digging deeper into the Bakken.

Recent advanced evaluation work completed by NUTECH in the Bakken suggests that you do not want to underestimate the change in frac height growth in your reservoir due to lateral well placement. To many, a small change in lateral placement would be dismissed as insignificant. Combining advanced reservoir characterization (NUTECH's NULOOK/Geomechanical) with detailed lateral placement analysis along with fluids that promote complex fracture propagation could be the solution. NUTECH's workflow utilizes high-resolution layering of petrophysics and geomechanics in their fracture modeling combined with RTA to more accurately predict stimulated reservoir volume. We are seeing the same significance in all other reservoirs as lateral placement along with horizontal and vertical well spacing become more understood and can be optimized. Talk to your NUTECH representative about taking your completion optimization to the next level. More information can be found on the website at www.nutechenergy.com.

EXPERTISE



Needing Reservoir Characterization in your area or an area of interest and curious if they have been petrophysically and geomechanically studied and analyzed? Visit NUTECH's [Interactive Map](#) that shows the over 60,000 wells NUTECH has analyzed over the last 20 years!

Contact your local NUTECH Account Manager or call 281.812.4030.

Stay tuned as these NULOOK well petrophysical evaluations will soon be available for order right from the internet.

UPCOMING EVENTS

URTec 2018

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