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UK Oil & Gas Investments PLC

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# UK Oil & Gas Investments PLC ("UKOG" or the "Company")

# UKOG signs alliance with USA global reservoir specialist, NUTECH Energy

### Alliance with NUTECH on Horse Hill discovery, UK Weald Basin

London listed UK Oil & Gas Investments PLC (LSE AIM: UKOG) is pleased to announce it has signed an alliance and consulting services agreement with US-based NUTECH Energy Alliance Ltd. ("NUTECH"), one of the world's leading companies in petrophysical analysis and reservoir Intelligence. NUTECH will work with UKOG to maximise the potential value of the Horse Hill area licences after the success of the Company's recent Horse Hill-1 ("HH-1") discovery in the UK's Weald Basin and assist UKOG with its other key UK hydrocarbon assets.

Headquartered and operating in Houston, Texas, NUTECH (<a href="www.nutechenergy.com">www.nutechenergy.com</a>) is a global oil services company specialising in reservoir evaluation and optimisation at all stages of the exploration and production life-cycle. NUTECH have analysed nearly 100,000 wells globally, for supermajors to small independents in 80 countries, containing many of the world's major conventional and unconventional hydrocarbon plays. NUTECH has been a technical leader in global conventional missed hydrocarbon pay analysis and, over the last 13 years, in the analysis of over 20,000 wells from within all identified unconventional plays in North America.

In 2014, prior to the UK Landward 14<sup>th</sup> Licence Round, NUTECH completed the detailed analysis of the conventional and

unconventional potential of 381 UK onshore released wells, situated within key hydrocarbon play fairways in seven basins across the UK. The study included 133 wells in the Weald and Wessex basins, currently UKOG's prime areas of interest.

NUTECH will immediately assist UKOG in the assessment of reservoir parameters, including oil in place volumes and rock mechanical properties, encountered in the HH-1 discovery. The analysis will encompass the conventional Portland Sandstone oil pay and the full 1,496 ft thick gross, highly organically rich and thermally mature, Upper Jurassic Kimmeridge Clay ("KC") Formation source rock section, which includes an oil saturated conventional Upper KC limestone reservoir. Additional analysis will be undertaken in the Middle and Lower Jurassic source rock sections to help the company understand hydrocarbon charge mechanisms and related potential in this part of the Weald basin. UKOG will obtain advice on testing and completion design for the HH-1 discovery and for future wells.

As part of the alliance agreement, UKOG will also obtain Nutech's 2014 analyses of key wells surrounding PEDL137 and PEDL246 licences, which cover 140 km² (34,600 acres). These analyses will be used to further define the likely semi-regional extent and size of the KC micrite and related plays encountered in the HH-1 well.

As reported by the Company on 17 December 2014, the overall Upper Portland sandstone conventional reservoir in the HH-1 and Collendean Farm-1 structure is currently interpreted to contain a range of gross oil initially in place ("OIIP") of between a low case (P90) of 5.7 million barrels ("mmbbls") and a high (P10) case of 12.1 mmbbls. The most likely case OIIP (P50) is currently calculated at 8.2 mmbbls. Current electric log interpretation of HH-1 also shows that the uppermost KC limestone encountered at 2,510.4 ft TVDss, contains a 20 ft continuous oil saturated zone within a 37 ft net pay zone, with no observable oil water contact, and an oil down to at 2,570 ft TVDss. The KC limestone lies between thermally mature, world-class oil source rocks within the KC Formation between 2,224 ft and 3,720 ft TVDss. Samples from the KC show the HH-1 well penetrated a sweet spot with total organic carbon ("TOC") of up to

9.4%, generative potentials (S2) of between 45-103 kg of hydrocarbons per tonne, hydrogen indices (HI) ranging from 759-1,098 and with measured vitrinite reflectance ("Ro") exceeding 0.81% at the base of the formation.

UKOG will also obtain NUTECH's analyses of the Arreton-2 well, an undeveloped potential Portland missed oil-pay discovery onshore Isle of Wight, drilled by British Gas in 1974. The Arreton-2 well is located within UKOG's 14<sup>th</sup> round application area, which lies adjacent to its P1916 offshore Isle of Wight acreage. In addition to the missed pay potential the Company will utilise its learning from HH-1 to investigate the hydrocarbon potential not only within the KC Formation but also in the Osmington Oolite limestone and Middle and Lower Jurassic hot shale sequences in the Isle of Wight area.

#### **Stephen Sanderson, UKOG's CEO, commented:**

"I am delighted that the Company will gain access to NUTECH's proven global technical expertise, unrivalled experience and extensive industry network in this specialist field, to help us fully understand the potential of the HH-1 discovery and its implications for our appraisal and wider exploration objectives. NUTECH brings to the Company, and to the UK, proven knowledge of how to assess and exploit cutting-edge plays, such as the KC micrite, from their vast experience, particularly in the onshore unconventional USA arena. The alliance is thus a sound investment for the future of UKOG from a technical and a business perspective"

## Allen D. Howard II, NuTech's CCO & EVP, commented:

"I am excited by the opportunity to work with UKOG on HH-1 given its potential significance to unlock the oil play potential of the KC in the Weald basin. NUTECH will endeavour to implement what has been learned by experience in evaluation and development strategies to assist UKOG's team achieve the best potential outcome in this proof of concept, with the aim of bringing great value to the UK's future onshore production. We at NUTECH, are pleased to engage in an alliance with an ahead of the wave team at

#### UKOG."

#### **Qualified Person's Statement:**

Stephen Sanderson, UKOG's CEO, who has over 34 years of relevant experience in the oil industry, has approved the information contained in this announcement. Mr Sanderson is a Fellow of the Geological Society of London and is an active member of the American Association of Petroleum Geologists.

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## **Glossary**:

discovery	a discovery is a petroleum accumulation for which one or several exploratory wells have established through testing, sampling and/or logging the existence of a significant quantity of
	potentially moveable hydrocarbons
electric logs	tools used within the wellbore to measure the rock and fluid properties of surrounding rock formations
gamma-ray log	an electric log which measures natural background radioactivity emitted mainly by potassium, uranium and thorium isotopes used as a sedimentary lithology discriminator
generative potential (S2)	the amount of hydrocarbons that can be generated from a unit volume of source rock established via the S2 peak from rock-evaluation

	pyrolysis, normally expressed in milligrammes of hydrocarbon per gramme of rock (or kilogramme per tonne)
hot shale	a shale rock displaying average initial TOCs normally exceeding 2% and represented by a high gamma ray electric log reading
hydrogen index (HI)	the amount of hydrogen relative to the amount of organic carbon in a sample, normally expressed in milligrammes of hydrogen per gramme of TOC. The higher the amount of hydrogen the more oil prone the source rock when subjected to time temperature and pressure; an initial HI over 450 normally indicates an oil prone source rock
micrite	a sedimentary rock formed of very fine grained calcareous particles ranging in diameter from 0.06 to 2 mm, often referred to as lime mudstone
mmbbls	millions of barrels
oil down to	the deepest level where oil saturation is measured at the base of a porous reservoir where it directly overlies rock of very low porosity and permeability where no reliable oil water contact can be established
oil initially in place	the quantity of oil or petroleum that is estimated to exist originally in naturally occurring accumulations before any extraction or production
oil saturation	the amount of the pore space within a reservoir containing oil
oil water contact	a bounding surface in a reservoir above which predominantly oil occurs and below which predominantly water occurs.
P10	a 10% probability that a stated volume will be equalled or exceeded
P50	a 50% probability that a stated volume will be equalled or exceeded

P90	a 90% probability that a stated volume will be equalled or exceeded
play	a set of known or postulated oil and or gas accumulations sharing similar geologic, geographic, and temporal properties, such as source rock, migration pathways, timing, trapping mechanism, and hydrocarbon type
porosity	the percentage of void space in a rock formation, where the void may contain, for example, water or petroleum
reservoir	a subsurface rock formation containing an individual natural accumulation of moveable petroleum that is confined by impermeable rock/formations
source rock	a rock rich in organic matter which, if subjected to sufficient heat and pressure over geological time, will generate oil or gas. Typical source rocks, usually shale or limestone, contain above an initial 1% organic matter by weight
sweet spot	the area within a shale source rock unit showing highest TOC and generative potential normally associated with basin centred deposition
thermally mature	a term applied to source rocks which have received sufficient temperature and pressure over geological time to generate hydrocarbons
TOC	total organic carbon - the weight percent amount of organic carbon within the rock which is a commonly used measure of hydrocarbon source rock richness
TVDss	true vertical depth below a subsea datum
vitrinite reflectance (Ro)	a measure of the percentage of incident light reflected from the surface of vitrinite particles in a sedimentary rock. It is referred to as % Ro and is a measure of the thermal maturity of a rock. Top of the oil window is dependent on source rock type, but is widely recognized to be at an Ro equivalent of between 0.5-0.7%

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