

22 December 2016

ADX Energy Ltd

## Nilde Field Development Planning MOU

**ADX and Calm Oceans Pte Ltd (COPL) enter into MOU to jointly progress a Field Development Plan for the Re development of the Nilde utilising COPL's leased self-install platform facility**

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### KEY POINTS

- COPL has developed and constructed a self-installing Mono Column Platform (MCP) and is designing a gravity based mooring, storage and offloading system (RPSO) ideal for the redevelopment of the Nilde Field.
- The MCP is capable of supporting a drilling rig, production processing equipment, water and gas reinjection facilities as well as accommodation.
- COPL intends to supply the MCP and RPSO to ADX on an agreed lease dry boat charter basis.
- COPL will assist ADX to secure additional topside facilities (production and drilling) at competitive rates from third parties or purchase equipment on an open book basis and lease these to ADX at an agreed lease rate based on an agreed rate of return.
- This innovative option enables the field to be re developed with reduced well costs (less 60%) utilising a platform drilling rig, enabling dry trees and reinjection of produced fluids to ensure environmental compliance.
- ADX plans to complete subsurface development studies, reserves studies including a third party reserves or resources assessment during the first quarter of 2017.
- COPL will provide surface facilities capital costs, operating costs, lease rate data and engineering design details required to submit a Development Plan to the Italian Authorities by June 2017.
- ADX believes the MCP and RPSO is technically superior option providing significant capital cost and operating cost savings as well as superior operability due to the ability for well intervention through out the project life.
- The owner of COPL, Mr Brian Chang, brings an extensive track record in development engineering, fabrication and installation. The combination of ADX geotechnical experience with COPL's facilities engineering capability significantly enhances the Nilde project both technically and financially.

*See Note 1: Background regarding Mr Brian Chang (Calm Oceans Pte. Ltd.) at the end of this release.*

**ADX goal now is to submit a compliant Field Development Plan to the Italian Authorities for the Nilde Redevelopment project by Mid 2017 incorporating the Mono Column Platform concept with the assistance and support of COPL.**

ADX Energy Ltd (**ASX:ADX**) advises that it has executed a binding memorandum of understanding with Calm Oceans Pte Ltd (**COPL**) setting out a program for collaboration during the Development Planning phase to jointly progress the Nilde Redevelopment Project.

ADX has a 100% interest\* and is operator of the d363 CR.AX permit located offshore Sicily which includes the Nilde oil field and the Nilde Bis oil discovery. ADX has undertaken extensive geotechnical and reservoir engineering studies utilising an extensive seismic, drilling and production data base and has commissioned independent 3<sup>rd</sup> party resource reports. ADX believes substantial economic resources remain at Nilde that can be recovered via an appropriate redevelopment project which will require the drilling of at least two production wells. It is ADX intention to redevelop the field reinjecting produced fluids including water, gas and CO<sub>2</sub> to ensure the project has best practice environmental compliance.

ADX is currently finalising dynamic flow modelling using the 3 dimensional geological model recently completed for the field. The modelling includes history matching of historical production data to that derived from the dynamic flow model. This process provides further validation of the geological model which is the input to the dynamic flow model. The work will provide an optimised subsurface development plan based on simulated production forecasting and a remaining recoverable resource for the field based on predicted well production. This work is expected to be completed during January 2017 and will be provided to an independent expert for a third party resource or reserves determination.

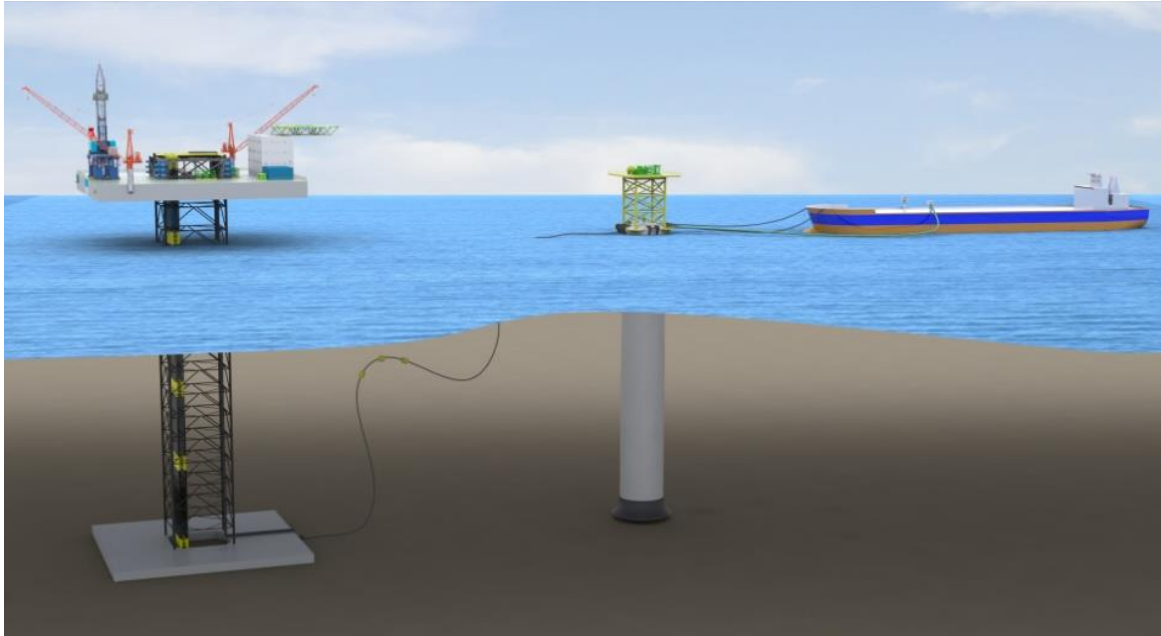
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COPL intends to supply the MCP and RPSO to ADX on an agreed lease dry boat charter basis. COPL will also assist ADX to secure additional topside facilities (production and drilling) at competitive rates from third parties or purchase equipment on an open book basis and lease them to ADX at an agreed lease rate based on an agreed rate of return.

The RPSO is expected to provide an optimal storage and offloading solution in terms of installation costs, manning costs and lease rates compared to a ship based floating storage offloading (FSO) system. If however the RPSO can't meet required cost, regulatory standards or schedule requirements the parties will consider a third party FSO solution.

The MCP includes an accommodation module and is designed to incorporate third party production facilities (production processing, power, pumping, compression, vent, utility and control systems) which are expected to compete favourably on lease rates, operating costs and capital costs (see Schedule 1) with other Mobile Production Unit (MOPU) solutions or a Floating Production Storage Facility (FPSO) solution.

*\* ADX has commenced a process with the Italian Designated Authority to convert the exclusively awarded application to a ratified licence. This process was commenced after the award by the Ministry of Industry. ADX believes ratification will occur during the first quarter of 2017.*



**The MCP and RPSO option schematic – incorporating production, storage and drilling capability with dry well heads. *Source: Calm Oceans Pte. Ltd, Mono Column Platform and storage technologies are proprietary, patented and patent pending.***

The MCP option provides the ability to drill and immediately produce minimising the time between capital expenditures and revenue. The economics of the system are further enhanced by the self install nature of the system which does not require the pre installation of expensive mooring systems, subsea well heads and subsea trees, subsea control systems and high pressure flexible flow lines. The major economic driver is a reduction in drilling costs and completion costs of approximately 60% compared to subsea options. This is partly due to the reduced drilling spread rate, the simplicity of dry wellheads at surface which do not require subsea control and tie back systems.

A significant operational advantage and risk mitigating factor is the ability to re-enter wells at any time or the cost effective ability to drill additional wells to maximise oil recovery. The costs of the platform drilling option is enhanced by the ability to purchase a high specification drilling rigs at highly discounted values.

The nature of the COPL and ADX relationship is expected to yield substantial cost savings in accessing third party equipment in the current turn down environment. COPL is willing to purchase equipment and lease it back to ADX on an open book cost basis there by taking advantage of reduced equipment costs. The re-deployable nature of the MCP platform enables other discoveries in the permit to be developed economically as well as already identified high value near field exploration targets.

## **Schedule 1**

### **Project Capital Cost Estimates**

<b>Capital Cost Item (Current Estimates)</b>	<b>US \$ (millions)</b>
Development Project Management for MCP, RPSO, Drilling Rig and Well Engineering	\$ 10.00
Engineering and Development Planning MCP Accommodation and RPSO	\$ 12.00
Production Facilities Engineering, Development Planning, Integration and Hook up	\$ 4.00
Purchase Flexible Flow lines and Offloading Hoses	\$ 4.00
Load, Tow, Offload & Install MCP & RPSO	\$ 7.00
Development Drilling - 2 Dry Tree Production wells and 1 Dry Tree Disposal well	\$ 30.00
<b>Total</b>	<b>\$ 67.00</b>

**Note:** Excludes pre production operating costs

### **Equipment Lease Rates and Operating Cost Estimates**

<b>Lease Rates and OPEX (Current Estimates)</b>	<b>US \$ / day</b>
MCP Bareboat (\$ mm)	\$48,000/d
RPSO Bareboat (\$ mm)	\$27,000/d
Topside Bareboat (\$ mm)	\$15,000/d
Operations Day Rate (\$mm)	Production \$12,000 /d, Management \$5000/d
Boats & Helicopters	FS Vessel \$6,000/d, SO Vessel \$7,000/d, Helicopters \$3,000/d
Overhead	Local \$5,000/d, Head Quarters \$3,000/d, Misc \$4,000/d
<b>Total</b>	<b>\$135,000/d</b>

### **Key Planning Milestones**

<b>Activity</b>	<b>Duration (months)</b>
Complete Reservoir Simulation	1
Independent Experts Resource / Reserves Report	2
Completion of Field Development Plan	3
Regulatory Approvals	6 to 9
FID to 1st Production	18

**The above schedule is a summary of COPL's and ADX current estimates for capital and operating costs. The lease rates and operating costs for production facilities are based on budget estimates from equipment providers**

The above costs represent a significantly reduced capital and operating costs compared to an FPSO facility based on ADX discussions with contractors to date. The reduced capital cost and large vendor lease component also significantly enhances ADX ability to finance the project via a partial sell down of the project. The ability to deliver the project with a capable, experienced, fabricator and project developer provides the ability to attract financial investors or oil traders willing to provide finance in exchange for future oil rather than relying on larger companies many of which are debt ridden in the

current low price environment. ADX believes this aligned approach with a capable and well funded contractor is what is required to finance and efficiently deliver profitable oil and gas projects. Of critical importance is the ability of the parties to jointly attract finance for the project by jointly providing a high level of commercial and technical definition at relatively low upfront cost.

ADX will provide an economic comparison in the coming weeks of the MCP option to a subsea development utilising an FPSO as previously presented in a “Project Update” on 21 April 16, which was based on indicative development cost estimates for suitable FPSO facilities.

### ***MOU Commercial Summary***

Under the MOU the parties have established their intent to undertake subsurface development design studies and facilities pre-feasibility studies with a view to submitting a compliant development plan for the redevelopment of the Nilde field.

In addition to the undertaking the ongoing subsurface and surface engineering work necessary to define the Basis of Design for the project and submit a development plan the parties will continue to jointly source third party equipment and services for drilling, production facilities and installation work with a view to fully defining the project schedule, lease rates, operating costs and capital costs.

The parties also intend to provide the necessary assistance to each other to secure pre project funding and facilities financing. ADX will provide all resources / reserves information as well as an independent resources / reserves estimate to support project financing and provide confidence for the suppliers of leased equipment.

The term of the MOU is the lesser of 6 months and the period from the execution date of this MOU to the date that ADX submits a compliant Field Development Plan.

During the term of the MOU ADX will bear the costs of ongoing geological studies, reservoir engineering studies, third party reserves / resource assessment costs, drilling and completion studies, documentation of a development plan and the documentation of a draft Basis of Design. During the term of the MOU COPL will be responsible for ongoing facilities definition costs relating to the MCP, FPSO, installation studies, Production Facilities integration and fit out, drilling facilities integration and concept design studies required to submit a development plan.

The parties agree to jointly fund a project coordinator to facilitate the integration work performed by both parties.

ADX recognises the experience and competencies of COPL as well as the contribution of COPL to the Nilde project including the costs incurred for project definition as well as the procurement of third party services on the best potential terms for the benefit of the project. ADX will recommend to its shareholders the issue of options to COPL as success fee if the parties submit a successful development plan for the Nilde project based on the utilisation of the MCP pursuant to this MOU.

The number of options will be 5,000,000, the term of the options will be until 31 December 2017 and a strike price of 4 cents per share.

During the Term of the MOU the parties intend to negotiate in good faith the necessary lease agreements between the parties as well as third party agreements necessary to conclude a commercial frame work for the project required to effect the development of Nilde.

*“Ian Tchacos, Executive Chairman said, ADX is very pleased to be working closely and aligned with COPL. This MOU enable ADX to utilise COPL’s extensive experience and competencies for the benefit of the Nilde project. We welcome the ongoing support of Brian Chang and his team. COPL has incurred significant engineering costs undertaking project definition work as well as endeavouring to procure third party services on the best potential terms for the benefit of the project. The incorporation of the innovative and cost effective mono column concept is expected to deliver technical, economic, environmental and operational benefits for the re development Nilde thereby and enhancing the projects ability to secure funding. This type of collaborative / aligned arrangement is what is required to deliver low cost projects, take advantage of synergies and access equipment on attractive terms.”*

**Note 1:**

**Background regarding Mr Brian Chang (Calm Oceans Pte. Ltd.)**

*Mr. Brian Chang is the owner of Calm Oceans Pte. Ltd. and owns several designs and patents including the proprietary Mono-Column Platform (“MCP”) and Relocatable Pivoting Storage & Offloading (“RPSO”) technologies. As an established offshore entrepreneur with more than 40 years of offshore experience, accumulating more than 600 offshore projects inclusive of many innovative vessels and platforms, Mr Chang brings value to ADX in providing cost-effective and early monetization solutions.*

*Mr Chang started his career in the 1960s with then Vosper Thornycroft in Singapore followed by then Far East Levingston Shipbuilding Limited (now known as Keppel FELS Limited) where he pioneered the construction of Singapore’s first jack-up drilling rig. Shortly thereafter, Mr Chang founded Promet Pte Ltd. (now known as PPL Shipyard) that positioned Singapore as one of the leading jack-up builders in the world. In 1994, Mr Chang moved to China and founded the Yantai Raffles Shipyard (now known as CIMC Raffles), which opened China’s offshore market with even some of the largest built vessels built today. In Promet and Yantai Raffles, Mr Chang helmed the companies as Chairman and Chief Executive Officer. Mr Chang is also often seen to work shoulder-to-shoulder with engineering and production to deliver timely and economic solutions to customers.*

*With the wealth of knowledge, experience and vision, Mr Chang moved back to Singapore and founded Calm Oceans Pte. Ltd. as the centre to integrate design, engineering, build, own and operation as a one-stop seamless approach from concept to outcome, unlocking value for clients especially in the new normalised oil and gas market.*

*Mr Chang is currently the Director of the JSC “Vostok-Raffles”, a joint venture with Rosneft Oil Company (since May 2010) and Non-Executive Director at TSC Group Holdings Limited (since July 2009). Apart from being the Chairman and CEO of Promet and Yantai Raffles, Mr Chang was also the Director of Bergen Group from December 2010 to April 2015.*

*Mr. Chang was awarded scholarship to pursue an engineering degree in United Kingdom. In 1965, Mr Chang graduated from the City University, London in Electrical Engineering (Hons). In the past 40 years, Mr Chang was appointment consultant to China National Petroleum Corporation (CNPC), advising oil companies in China and Russia related to offshore engineering, research and developments. In 2014, Mr Chang was conferred the Honorary Fellow, Institute of Engineer Singapore (IES) and in 2015, the Asia Honorary Fellow, Institute of Engineers Singapore.*

*Mr Chang believes in the development of engineers and has been an active proponent of developing engineers for the future. As a result of his dedication, a building in the new IES building was named after Mr Chang.*



### ***Mono-Column Platform (MCP)***

*The patented proprietary Brian Chang designed MCP is a self-installing offshore platform with the capability to provide high payload and configured for various functions meeting myriad offshore project requirements. The MCP comprises a Deck (platform) connected to a Mat (foundation) through a 4-chord square truss structure (Mono-Column). The MCP boasts an impressive operational capability up to 500 feet water depth, supports high deck load with an enormous deck space.*

*The MCP technology enables topside facilities to be pre-assembled and outfitted at shipyard as a complete unit that can be self-installed on site, reducing offshore construction and integration risks while shortening the project schedule significantly. The MCP can be flexibly fitted with modular facilities resulted in minimum downtime for the end user. The modular facilities can be installed either individually or in combination to suit the end user's requirements, e.g. drilling, production, accommodation and ancillary support system. This enables an array of activities to be carried out co-located within a platform.*

*With the Mat foundation, the MCP can be deployed to sites with soft seabeds that are challenging for conventional jack-up rigs. The MCP because of its Mat foundation does not run the risk of a punch-through which could occur with conventional three-legged/four-legged Jack-Up rigs. As the Mat foundation sits firmly on the seabed, whether hard or soft, it provides stability to the MCP with the installed modular facilities.*

*On the other hand, the MCP is designed to stay in location for a period of 20 years or more. Apart from the advantages in overcoming the challenge associated with low CAPEX and high complexity in project execution, it enables end-users to early monetize resources efficiently. The ability of relocating the MCP from location to location and its ability to configure with different modular facilities as needed, enable marginal oil field owners to economically monetize the resources more efficiently.*

*Consequently, the MCP is designed to specifically address the conundrum relating to marginal fields, as well as the challenges associated with early monetization of oil fields.*

### ***Relocatable Pivotal Storage and Offloading (RPSO)***

*The proprietary Brian Chang designed RPSO is a self-installing gravity-based storage and offloading system. It can be designed with various sizes catering to the specific field storage needs. The RPSO comprises a contiguous and uniform double-hull structure designed to withstand site conditions. The RPSO can be un-manned and the requisite pumps and marine systems shall be installed in accordance with international offshore and marine standards. The RPSO represents an efficient storage system enabling it to be self-installed, reducing cost in using traditional mooring technologies for storage vessels.*

*Together with the MCP, the RPSO forms part of a coherent field development plan; providing a seamless drilling, production, storage and offloading solution. With ABS Approval-In-Principle (AIP), the RPSO can be developed meeting IMO, MARPOL, ABS MODU Code and notation as an offshore installation. The RPSO is designed with a storage capacity of 300,000 bbl at 100 meters water-depth. When deployed, the RPSO performs as a self-installed mooring system for FSO if need be, enabling dual use.*



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## Nilde Area Background

The Nilde oil field was discovered by ENI in shallow water offshore Sicily and came on stream with one vertical well (Nilde-2) in 1980 when the oil price was US\$37 per barrel. High productivity of light oil (API 39) was achieved (around 10,000 bopd from Nilde-2) in shallow reservoirs at a depth of approximately 1500 meters. The Nilde 2 well produced at high rates for over 7 years. A horizontal production well was drilled very close by (less than 1km) in 1986 to increase production to 12,000 bopd when oil prices started to decrease significantly. Both wells had subsea wellhead completions that were tied in to an FPSO (Figure 1 below) which essentially was a converted tanker tied to a so called SALS (single anchor leg storage system) system. The FPSO was subsequently upgraded and used for the ENI operated Aquila oil field.

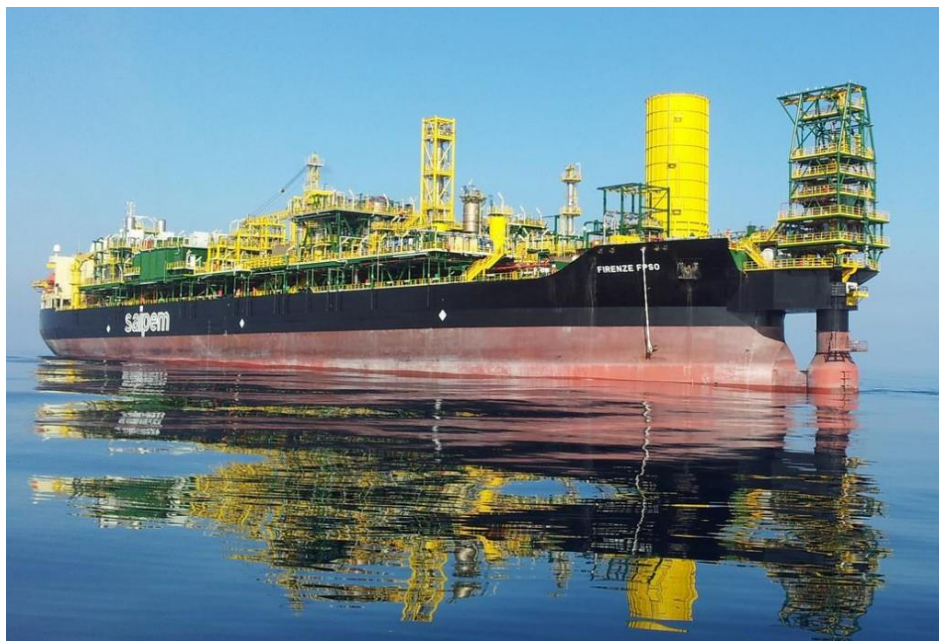


Figure 1: “Firenze” FPSO, as it looks today. Source: SAIPEM

Late life well performance was affected by an interpreted strong water aquifer which resulted in an increase in water cut which could not be remedied due to the lack of provision of production facilities capable of artificially lifting the wells. The decision was made prematurely to abandon production instead of drilling additional development/appraisal wells within potentially undrained areas in the field in 1988. The decision to abandon is reported to have been triggered by a collapse in oil price to US\$14 per barrel.

In addition to developing the Nilde field, ENI also made several oil discoveries in the area, notably nearby Nilde-Bis wells, Norma-1 and Naila-1 which were all successfully tested and proved the presence of both light oil and the excellent Miocene age Nilde carbonate reservoir. To date these discoveries remain undeveloped.

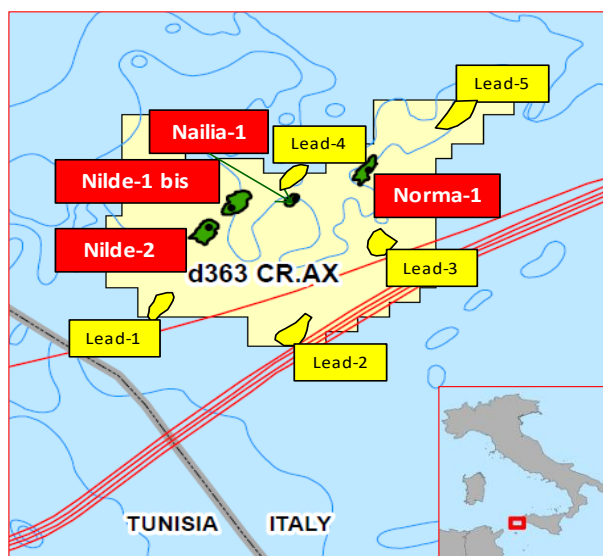


Figure 2: d363 CR.AX Permit showing Nilde Field and proximal discoveries. Exploration prospects shown in yellow.

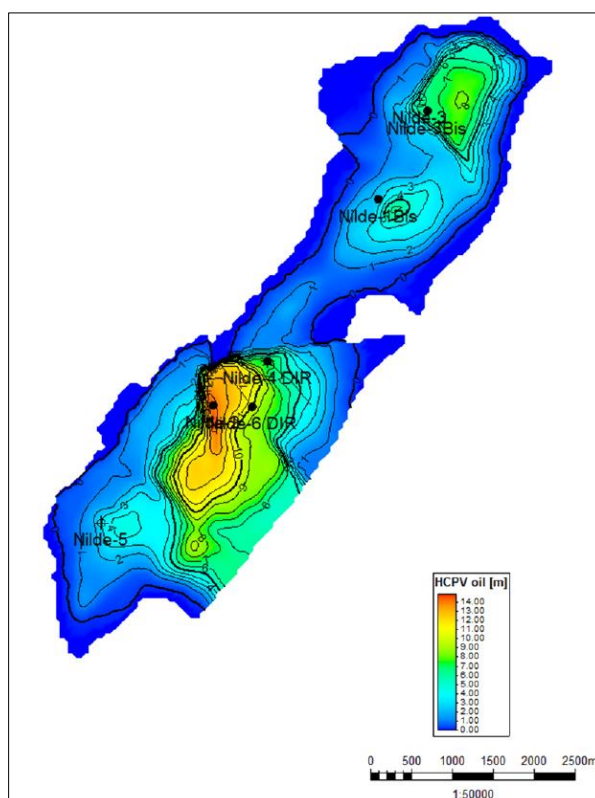


Figure 3: Nilde & Nilde Bis Oil field hydrocarbon pore volume map generated from detailed 3D geocellular model (Petrel). Case shown is currently the “best technical” case

The d363 CR.AX application permit was awarded to ADX via gazettal in May 2014 at a 100% equity interest. ADX has committed to seismic reprocessing, and development studies in the first license phase (6 years) and a well within the first four years of this phase. An extension of one year is possible. Upon drilling a well the license can be extended for another 6 (3+3) years.

ADX initially applied for the d363 CR AX license unaware of the remaining resource potential of Nilde and the nearby discoveries. The focus at the time was to explore the 3D seismic covered foothill anticline structural play of its neighbouring Tunisian Kerkouane license.

Since the award of the permit ADX has undertaken geotechnical studies focusing on the Nilde shut in oil field and three discoveries in close proximity, the Nilde-Bis, Norma and Naila discoveries (see figure 2) with a view to determining their resource potential and the potential commercial viability of the resources. ADX was very encouraged by the production performance of the reservoirs at Nilde, the modest water depths (90 meters at Nilde), modest drill depths as well as excellent fiscal terms which enhance the potential commerciality of the resources in a low oil price environment.

Figure 3 shows all the newly acquired data has been integrated into a 3D geocellular model. The map below shows the outline of the Nilde and Nilde Bis oil field. The colours shown are representative of the so called hydrocarbon pore volume which is the product of oil column in meters as well as oil saturation and porosity in percentages.

The important attributes of the Nilde Area observed from the technical and economic work undertaken to date are summarised as follows:

- The presence of historical production data and test data for all undeveloped discoveries provides significant confidence in relation to the performance of reservoirs and crude quality which is light oil (39° API) discovered within the Nilde Area.
- High well productivities demonstrated by previous production wells (approximately 10,000 BOPD from vertical wells).
- Shallow drill depths (less than 1700m).
- Modest water depths (approximately 90m at Nilde main field location) and relatively benign sea conditions offshore Sicily.
- Excellent seismic data quality and good vintage 2D seismic coverage.
- Potential for a staged low cost development focusing initially on Nilde remaining resources and Nilde-Bis (approximately 28 million barrels 2C resource based on the Senergy estimate).
- A substantial 1C resource at Nilde and Nilde-Bis of 18 million barrels based on the Senergy estimate.
- The combination of the above factors results in robust indicative economics at sub US\$20 per barrel oil pricing for the 1C resource case.
- Simple, modest royalty based regime (4% royalty, with royalty free production of first 350,000 bbls oil).
- Near field exploration potential exists in the block which may provide significant upside beyond the discovered resources, notably a sizable undrilled anticline structure located just 7 kilometers NW of the Nilde main field area.

The following table summarise the results of the independent evaluation of the Contingent Resources from the Nilde Area from the Senergy report announced on 17 February 2016:

Gross Contingent <sup>1</sup> Resources Volumes (MMstb)			
	1C <sup>2</sup> Estimate	2C <sup>2</sup> Estimate	3C <sup>2</sup> Estimate
Nilde Field	8.7	13.1	17.8
Nilde- Bis Discovery	9.3	15.3	21.0
Norma Discovery	1.2	3.9	12.9
Naila Discovery	1.0	1.7	2.7
<b>Total<sup>3</sup></b>	<b>20.2</b>	<b>34.0</b>	<b>54.4</b>

The above evaluation by Senergy was based on the volumetric estimation method.

#### Notes Contingent Definitions

<sup>1</sup> Contingent Resources: those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations but, for which the applied project(s) are not yet considered mature enough for commercial development due to one or more contingencies.

<sup>2</sup> 1C, 2C, 3C Estimates: in a probabilistic resource size distribution these are the P<sub>90</sub> (90% probability), P<sub>50</sub>, and P<sub>10</sub>, respectively, for individual opportunities.

<sup>3</sup> Totals are by arithmetic summation as recommended under PRMS guidelines. This results in a conservative low case total and optimistic high case total.