

## **Block 65 - Onshore Oman**

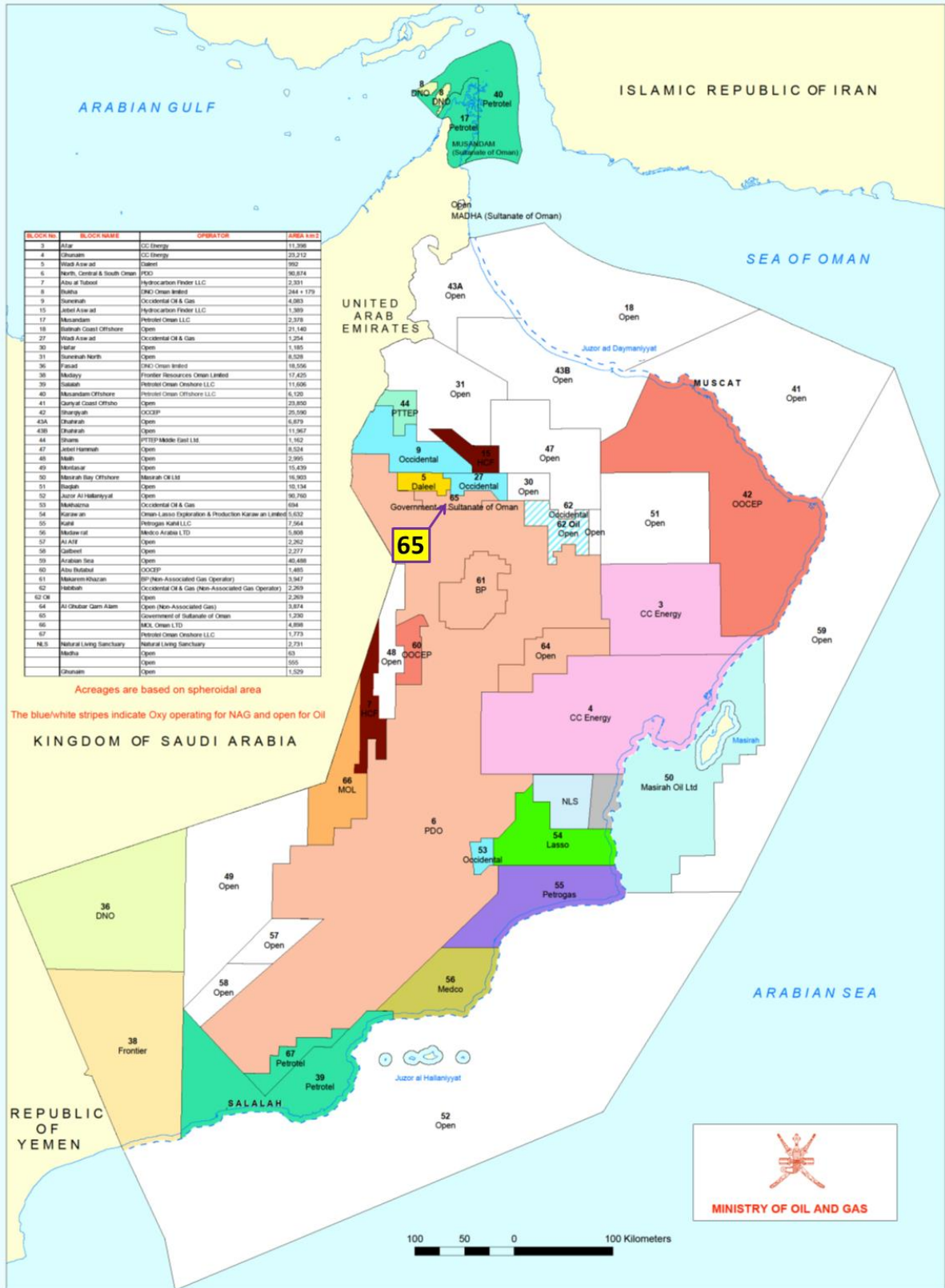
### **SUMMARY**

Block 65 is a 1,230 km<sup>2</sup> area located in the interior of Oman. Over its history Block 65 has had several owners and it has also experienced several configuration changes. These configuration changes mean that not all previous block holders possessed data across the entirety of the block. This increases the block's prospectivity, especially since significant oil fields exist in adjacent blocks.

Wells drilled to date have focused upon the Cretaceous age section, in particular the Natih and Shuaiba formations have been the primary target intervals. The Lekhwair Formation has also been penetrated as a secondary target. Oil has been discovered in the Natih Formation. Shows have been observed in the UER, Natih and Shuaiba formations.

There are two plays within this block. The first is conventional oil and gas within the Natih and Shuaiba formations. In portions of the block both formations possess good reservoir properties. This is an extension of the highly successful Natih and Shuaiba formations' play in adjacent blocks 9 and 27. The second play is the Natih E unconventional oil play. This unit is a source interval and also a reservoir. Development of unconventional resources is only beginning in the Sultanate and the Natih E has been recognized as a prime target across northern Oman.

# SULTANATE OF OMAN CONCESSION BOUNDARIES



This map is not an authority on international boundaries.

Drawing No.: 108094001.mxd  
Date: 01 June 2016

Block base map with Block 65 identified

## **BLOCK OWNERSHIP HISTORY**

Over its history Block 65 has had several owners and it has also experienced several configuration changes. These configuration changes mean that not all previous block holders possessed data across the entirety of the block. Below is the list of companies that have owned all or part of the current block.

- Petroleum Development (Oman) Ltd. (PD(O)), comprised of Shell, PARTEX and eventually Compagnie Francaise de Petroles
- Petroleum Development Oman, Ltd. (PDO) comprised of Shell, PARTEX and eventually Total and the government of Oman
- Japex Oman
- Occidental Oman
- Oman Oil Company Exploration and Production (OOCEP)

The first well was drilled in 1968 by PD(O): the Maqhoul-1. The last well on the block, the Karam-1, was drilled OOCEP in 2016.

## **AVAILABLE DATA**

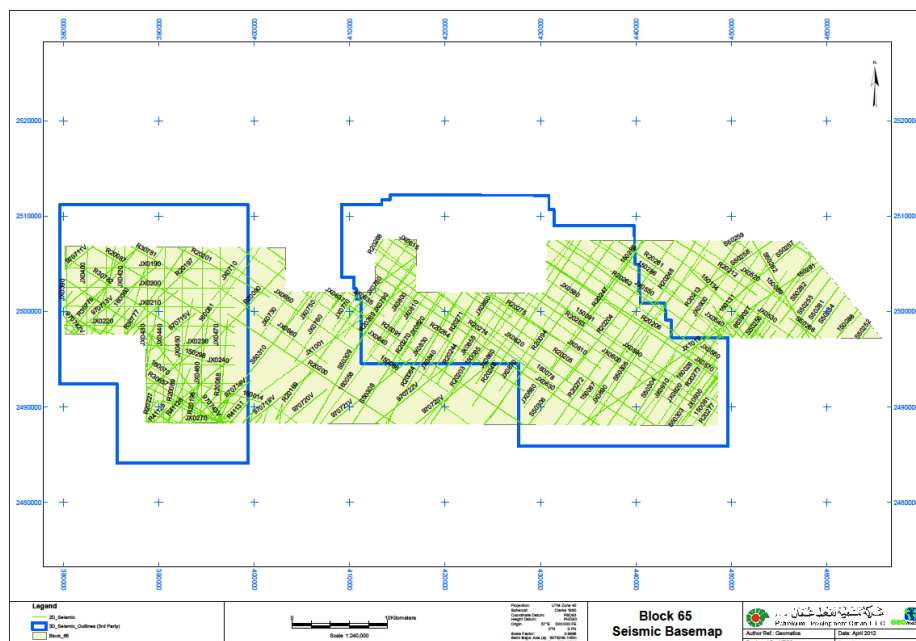
2D seismic data: 114 lines in segy format plus additional scanned lines

3D seismic data: Two surveys that cover portions of the block

Block seismic base map, satellite image map and infrastructure map

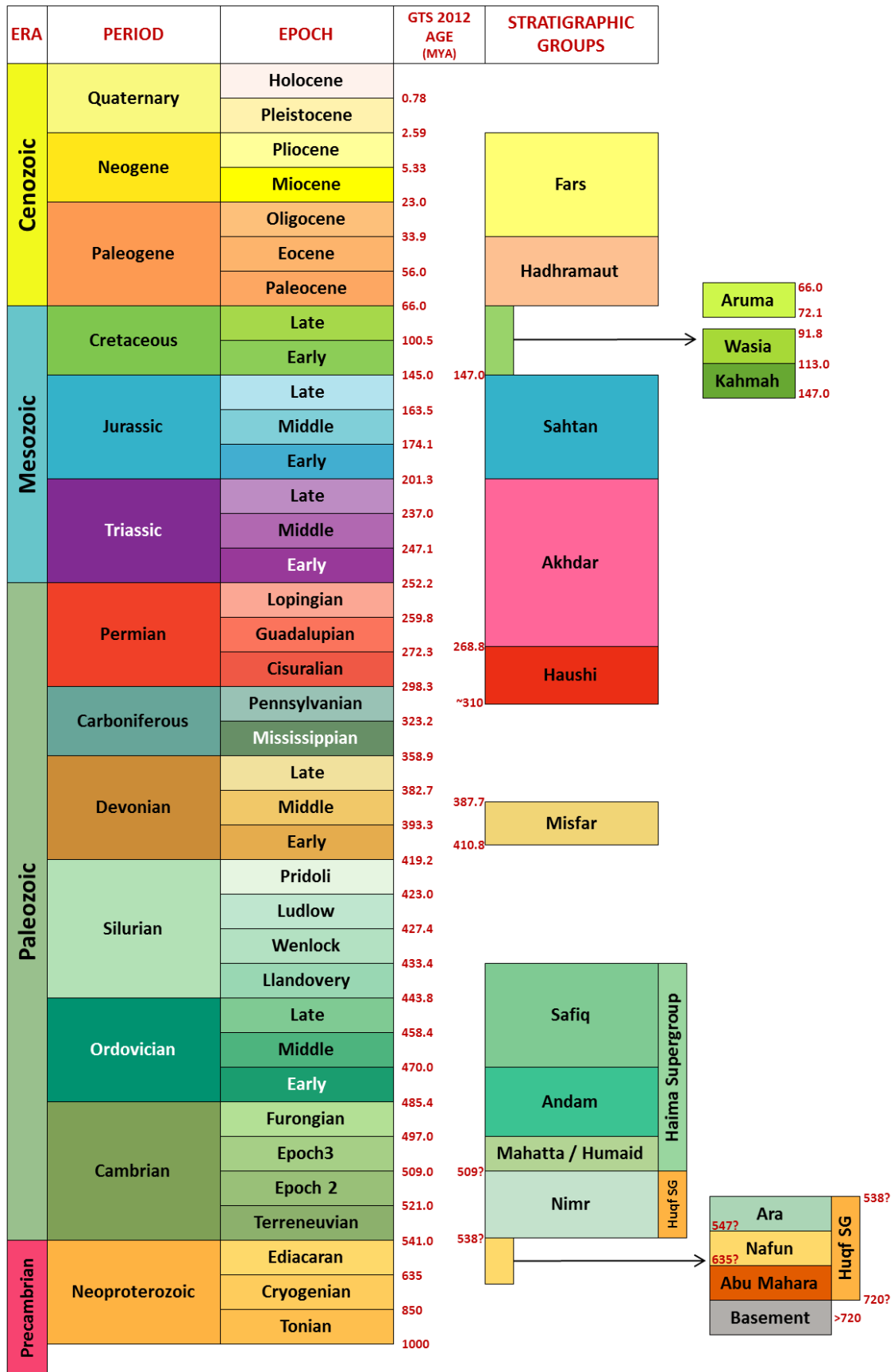
Gravity and magnetics data

Data for 6 wells, including raw log data and well reports



**Seismic base map**

# STRATIGRAPHY



Oman chronostratigraphic chart (GTS 2012 dates incorporated)

The figure below presents the Cretaceous section within the block. Wells drilled to date have focused upon this section. In particular the Natih and Shuaiba formations have been the primary target intervals. The Lekhwair Formation has also been penetrated as a secondary target.

GROUP	FORMATION	MEMBER
Aruma	Simsima	
	Fiqa	Arada
		Shargi
Wasia	Natih	Natih A
		Natih B
		Natih C
		Natih D
		Natih E
		Natih F
		Natih G
	Nahr Umr	U. Nahr Umr
		Marker LS
		L. Nahr Umr
Kahmah	Shuaiba	U. Shuaiba
		L. Shuaiba
	Kharaib	Hawar
	Lekhwair	
	Meso. Clastics	
	Habshan	
	Salil	
	Rayda	

Stratigraphy of the Cretaceous section within Block 65

### OUTCROP AND ANALOGS

The following formations are present in multiple outcrops in the Hajar Mountains (Jabals Akhdar and Shams being prime locations).

- Natih Formation: Reservoir and source
- Nahr Umr Formation: Regional seal
- Shuaiba Formation: Reservoir

## **DISCOVERIES**

The Karam-1 made a significant discovery in the Natih Formation (Natih A/B). The Al Shreega-1 encountered a thin oil column in the Natih A.

## **SHOWS**

Oil shows were observed in the following formations.

- UER Formation (Hadhramaut Group): 23° API oil
- Natih A: 22.6° API oil
- Shuaiba Formation

## **PROSPECTS**

There are currently several prospective structures identified within the block. These are on trend with Oxy Oman's Khamilah/Wadi Aswad trend.

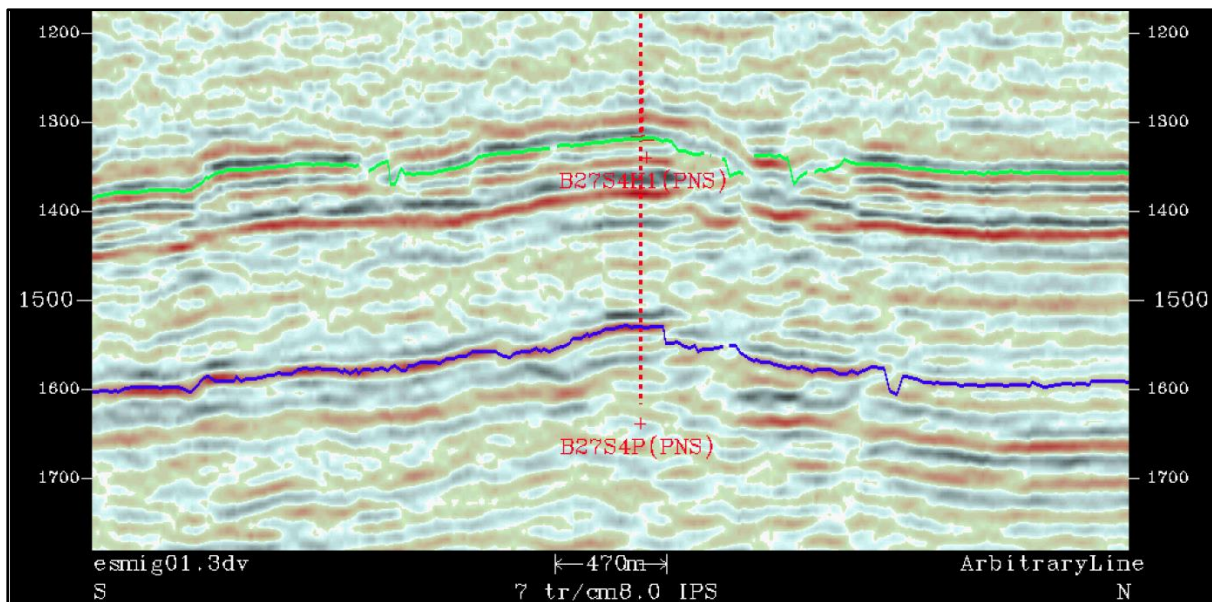
## **PLAY SUMMARY**

There are two plays within this block. The first is conventional oil and gas within the Natih and Shuaiba formations. In portions of the block both formations possess good reservoir properties. This is an extension of the highly successful Natih and Shuaiba formations' play in adjacent blocks 9 and 27.

The second play is the Natih E unconventional oil play. This unit is a source interval and also a reservoir. Development of unconventional resources is only beginning in the Sultanate and the Natih E has been recognized as a prime target across northern Oman.

## **TRAP**

Predominantly 2-way dip-closed, fault-bounded anticlines. Stratigraphic traps associated with progradational clinoforms and carbonate platforms exist in adjacent blocks and are expected within this block.



Southwest (left) to northeast (right) seismic line through the B274WPST1. A horizon within the Natih Formation is shown in green. The top Shuaiba Formation is shown in violet .

### **RESERVOIR**

Wasia Group

Natih A/B

Natih E is an unconventional hydrocarbon target (self-sourced)

Kahmah Group

Shuaiba Formation

### **SEAL**

Aruma Group

Shales within the Fiqa Formation

Wasia Group

Natih Formation's more shale-prone members

Nahr Umr

Kahmah Group

Low permeability carbonate mudstones and shales associated with the basal portions of its formations

### **SOURCE**

Natih Formation

Safiq siltstones

Huqf Supergroup

## **MOVING FORWARD**

Proceeding further takes you out of the public area. Doing so gives you access to the raw data as well as the ability to order Target's interpretation-ready package. There are 3 steps for moving forward.

### **Step 1: MEERA Subscription for the bid round**

MEERA is the software platform being used by the MOG. It allows users to view data live and interactively from anywhere in the world. For more information on this platform please view the LDR video.

The subscription permits general access and allows viewing of the data packages. The system is the official point of contact with the MOG and will be used for

- Interaction with the MOG, including clarification requests.
- Bid submissions
- Award notifications

### **Step 2: MOG raw data viewing and purchase**

These data can be viewed live from anywhere in the world via the MEERA platform. Acquiring the raw data is simple. These data can be downloaded directly or can be provided on digital media for a selected destination.

There is a large amount of raw data for this block. These data include seismic lines, well documents and gravity data. Following is a brief summary listing for seismic and well data.

2D seismic data from multiple surveys in segy format (114 lines) plus additional scanned 2D lines.

Three 3D seismic volumes. One volume merges the two 3D volumes within the block. It is a standard segy volume whose boundary has been cropped to the block boundary. The other 3D volumes cover areas in and outside of the block. The data for these volumes have been stored using Petrobank data management software. Hence these volumes exist only as a set of segy files for each inline.

Well Data: Data for six wells. Not all wells contain the same types of data. All have log data and many have well documents. Note, the wells have used different units for measured depth: some use feet while others use meters.

- Al Shreega-1
- B27 South 4-Way
- Karam-1



- Maqhoul-1
- Masdar-1
- Wadi Zibra-1

### **Step 3: Target Oilfield Services' interpretation-ready package viewing and purchase**

Target Oilfield Services has prepared an interpretation-ready Techlog project and an interpretation-ready Petrel project. The Techlog project has resolved the use of different units for measured depth. All depths are in meters.

The Petrel project contains all seismic data, well tops, and the raw, standard well log data. Wells reflect depth in meters. In addition, Target has reassembled the 3D data from those volumes previously stored using Petrobank data management software into standard segy volumes. While no time/lateral shifts have been applied, these new volumes cover areas outside and inside the block.

### **TARGET OILFIELD SERVICES' BLOCK ANALYSIS AND INTERPRETATION**

Upon request, Target Oilfield Services will complete an interpretation of this block. It places the block within a regional context and incorporates Target's extensive knowledge of Oman's geology and reservoirs. This is a separate project, not included as part of the tender round. Please contact Target for additional information.

### **MINISTRY INFORMATION**

When available the standard MOG data to be provided include:

- 2D and 3D seismic data within the block boundaries
- Gravity data associated with the block
- Well files for all wells in the block
- Cultural data: Infrastructure, etc.

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### **TARGET OILFIELD SERVICES INFORMATION**

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