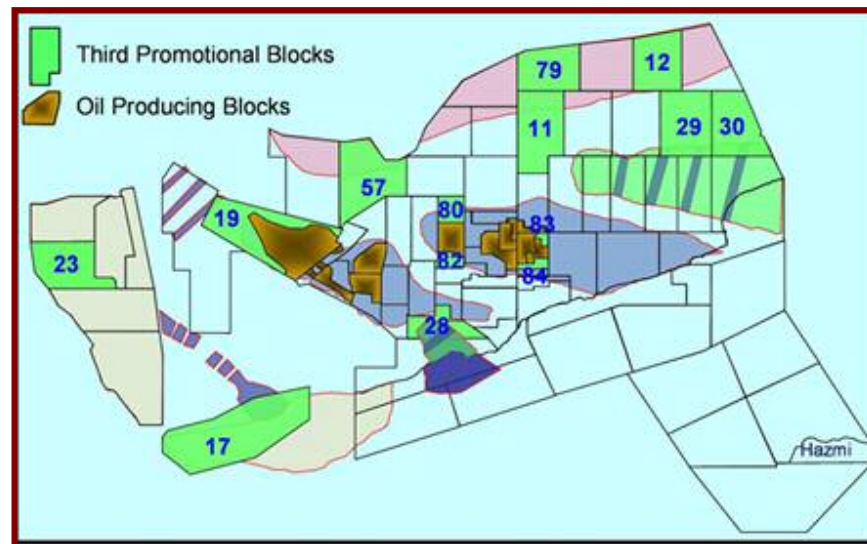
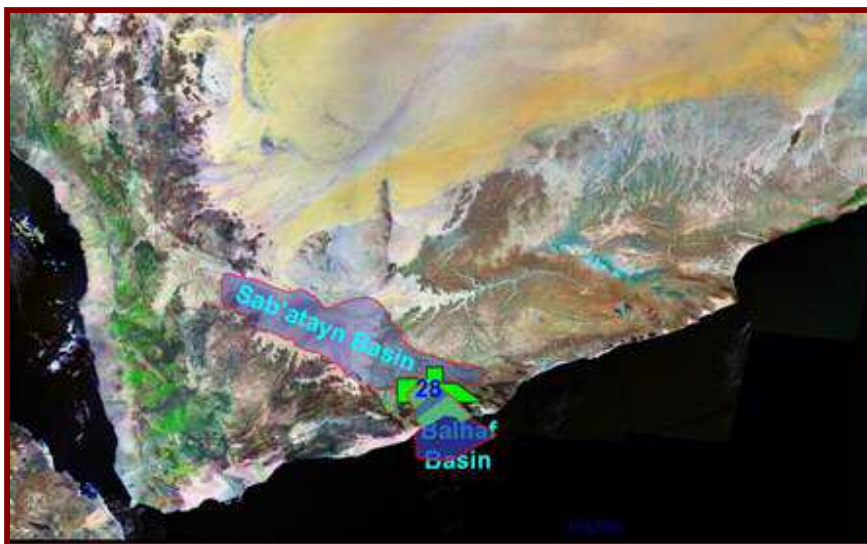
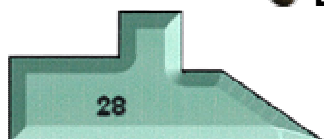


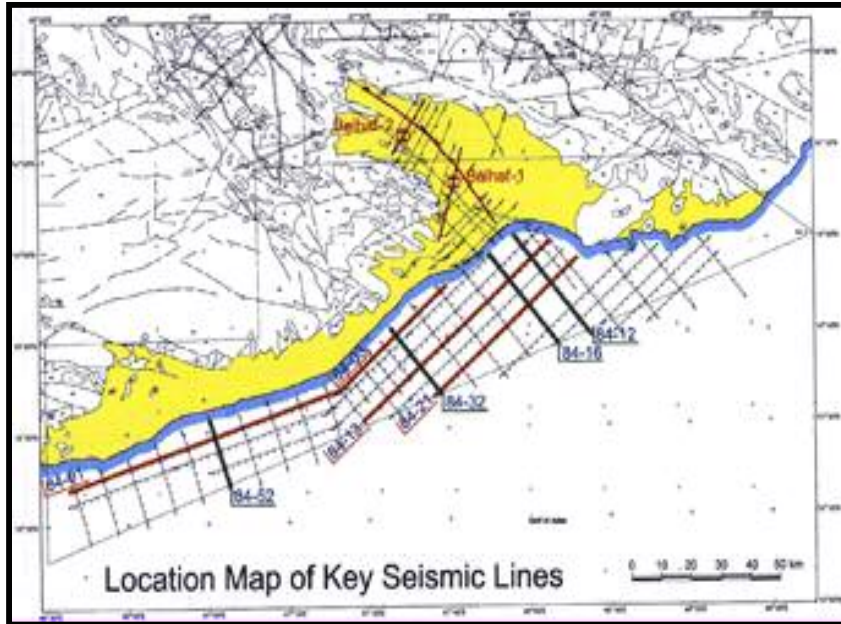


Block 28 (North Balhaf)

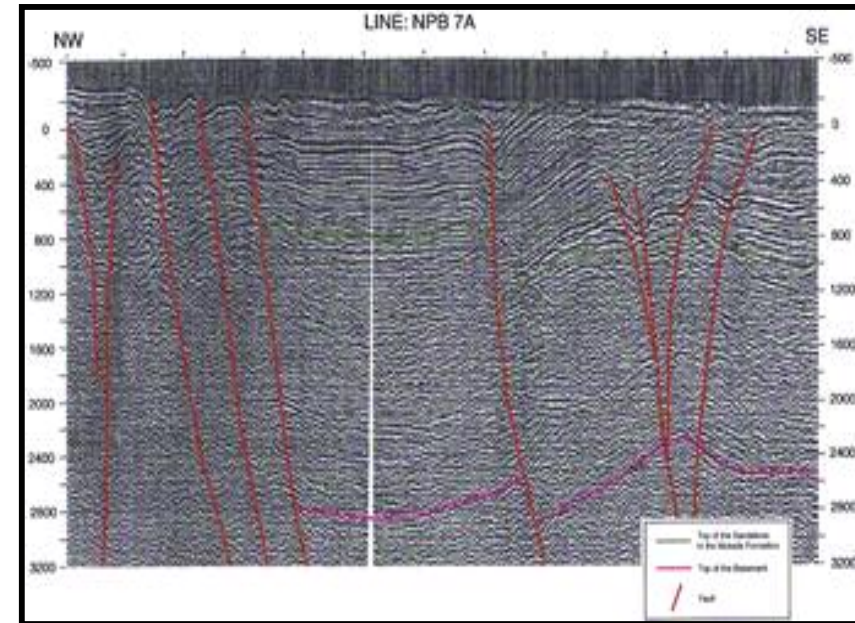
- The North Balhaf Block (28) occupies an area of 4465 km² on the Balhaf Basin and partially on the Shabwah (Sab'atayn) Basin near the southern coast of Yemen.
- Block (28) lies on the onshore area. It is bordered on:
 - The north by Exploration Blocks (3 and 49).
 - The south by the Block (76).
 - The east and north-east by the Jahi – Mukalla High and Aswad Ridge.
 - The west by Mahfid Massif (Exploration Block 1).



Area (Km ²)	: 4,465
Province	: Shabwah
Basin	: Balhaf, Hajer Basins
Wells	: 2
Seismic	: 203Km 2D



Previous Work Map



Seismic Section in Balhaf, Sab'atayn Basin

PREVIOUS EXPLORATION ACTIVITIES

Company	Period	Activities
PED	1983	Geophysical (2D seismic)
IPG, Elf, Procan, Hunt and YEPCO	1983-1989	Geophysical (2D seismic) Drilling 1 well
Total	1989-1992	Geophysical (2D seismic) Drilling 1 well
MOL	1998-2003	Geophysical (2D seismic)

DRILLED WELLS

WELL NAME	COMPANY	DATE	TD	SHOWS
			TD FM	STATUS
Balhaf#2	YEPCO	88	4095 m	No shows
			Basement	P & A
Hufair#1	Total	89-90	4022 m	Oil/gas shows
			Basement	Non commercial oil / P & A

- The Block (28) lies on two sedimentary basins (Balhaf and Sab'atayn) and would have the petroleum systems for those basins.
- Many oil and gas fields have been discovered in the Sab'atayn Basin.
- The Balhaf basin deepening (basement sinks) northeastward.
- The sedimentary filling of the two basins consists of the Mesozoic (Jurassic and Cretaceous) and Cenozoic rock-types.
- The proved mature source rock is the Madbi Formation.
- Balhaf-1 well (Balhaf Basin) confirm the presence of good reservoirs:
 - Tawilah sandstone.
 - Kohlan sandstone.
 - The Naifa and Shuqra limestones are porous and possibly fractured.
- Gas and condensate were discovered by Hufair-1 well (Sab'atayn Basin) in non commercial quantities, and the well confirm the presence of reservoirs in:
 - Qishn, Lam and Kuhlun clastics.
 - Intra Sab'atayn Salt fractured dolerites.

The Balhaf Basin occupies the Balhaf Graben and the adjacent part of the Gulf of Aden. The Balhaf Graben is a relatively narrow deeply subsided structure lying between the Mahfid Massif and both the Mukalla High and the Aswad Ridge. The northeast and southwest boundaries of the graben are formed by faults trending from the northwest to the southeast. The basement lies at a depth of 6,000m in the southeastern and the deepest of the graben.

The Balhaf Graben is a primarily Cretaceous basin, with pronounced Late Tertiary, Miocene? - Pliocene reactivation.

It was isolated from the Marib Al Jawf - Shabwa Rift System during the Kimmeridgian - Tithonian rifting episode by right lateral, strike slip faults defining the northern margin of the Imad High.

It is the northern continuation of the Berbera Basin in northern Somalia, which has hydrocarbon discoveries.

The Shabwah depression is a part, together with the Wadi Hajar basin to the E and the Marib al Jawf basin to the NW, of a NW-SE trending sedimentary basin (about 560km long and up to 140 km wide) generally referred to as Sab'atayn Basin.

The Sab'atayn Basin formed as a consequence of a Late Jurassic (Kimmeridgian-Tithonian) extensional phase related to the initiation of spreading that led to separation of India-Madagascar from Afro-Arabia.

PETROLEUM SYSTEM

TRAPS AND PLAY FAIRWAYS

- Horst and tilted fault blocks dominate traps.

SOURCE ROCKS

- The possible source rock the Madbi Formation might be present in the Balhaf Graben, because it was found in the Jurassic outcrops in the west of the Balhaf Graben. Other potential source might be the coal and mudstone of the Tawila Group.
- It is possible that the source rock sequences may be found in the Upper Jurassic and Lower Cretaceous strata in deeper lows of the Balhaf area.

RESERVOIR - SEAL

- Fractured Basement
- Kohlan Fm sandstone seals by the Shuqra Fm
- Shuqra Fm, Naifa Fm and Qishn Formation Carbonate Member shallow marine limestone
- Lam Clastics sealed by Sabatayn Salt
- Qishn Clastics sealed by Qishn shale and limestones
- Harshiyat Fm and Mukalla Fm sandstones sealed by The intra-formational mudstone or limestone

