

KINGDOM OF MOROCCO



المكتب الوطني للهيدروكربونات و المعادن  
OFFICE NATIONAL DES HYDROCARBURES ET DES MINES

# Activity report 2012

# ONHYM







His Majesty The King Mohammed VI, May COD Assist Him.

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**ONHYM**

المكتب الوطني للمinerالوقود والموارد المعدنية  
OFFICE NATIONAL DES HYDROCARBURES ET DES MINES



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Amina BENKHADRA  
General Director



# MESSAGE FROM THE GENERAL DIRECTOR

If global economic growth continued to digress in 2012 with a volatility of commodity prices, global investment in exploration/production of hydrocarbons and mining grew at a steady pace.

In this context, the year 2012 was satisfactory for ONHYM. Its performance conformed with the budget plan thus reflecting the commitment of ONHYM to consolidate its efforts for hydrocarbon and mining explorations made in recent years.

This year has seen an unprecedented demand as a result of the oil companies growing interest in the exploration of sedimentary Moroccan basins, bringing the number of partners to 27 including two majors ones. The exploration activity, specific to ONHYM, was noted for the achievement of its drilling operations at the MKL-110 well in the Essaouira basin.

Hydrocarbon production, focusing on the two areas of Essaouira and Gharb, was characterized by the commissioning of the 8" new pipeline

for the commercialization of the new discoveries made under partnership. As for the mining exploration, the new implemented strategy has increased the number of objectives specific to ONHYM to 18 and the objectives achieved through partnership to 11.

In addition, several sales contracts and protocols have been signed thus increasing the number of partners to 30 companies. Indeed, mining research has been intensified in order to renew existing reserves and to discover new resources using the most advanced tech-

nologies and building partnerships with major international mining groups. The over-

haul of the Mining Code with favorable incentives for national and international investment will represent a powerful tool to develop the mining sector.

From an organizational perspective, a study of ONHYM's development strategy is underway and it is intended to enhance the mining and hydrocarbon heritage (excluding phosphates) of the Kingdom, and make the most of its expertise in the country and abroad.

In addition, we are working to strengthen promotion and greater involvement of private operators in research and development. For each project, ONHYM relies on its primary asset: its women and men.

ONHYM includes more than 100 geologists and special-



” ONHYM is committed to make every effort for the economic and social development of our country, under the enlightened leadership of His Majesty the King Mohammed VI, may God assist Him. “

lists in related disciplines. ONHYM is a composition of multi-disciplinary project based teams working in synergy with partners.

ONHYM continues with determination the consolidation of its strategy for strengthening cooperation and partnerships with investors, whose objective is to promote the mining and oil resources of the Moroccan subsurface.

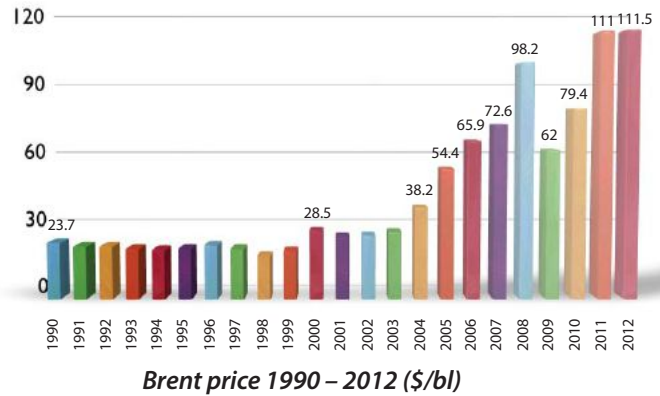
# INTERNATIONAL & NATIONAL CONJUNCTURES

## International conjuncture

As in the year 2011, the world economic growth pursued its slow down during the year 2012. Indeed, the global economy was marked by the persistence of the imbalance and by the effects of the Euro zone debt crisis, the volatility of the prices of raw materials and the exchange and by the geopolitical risks. The world economic growth, limited to 3.2%, marked a slow down with regard to the year 2011 (3.9%) and the year 2010 (5.1%).

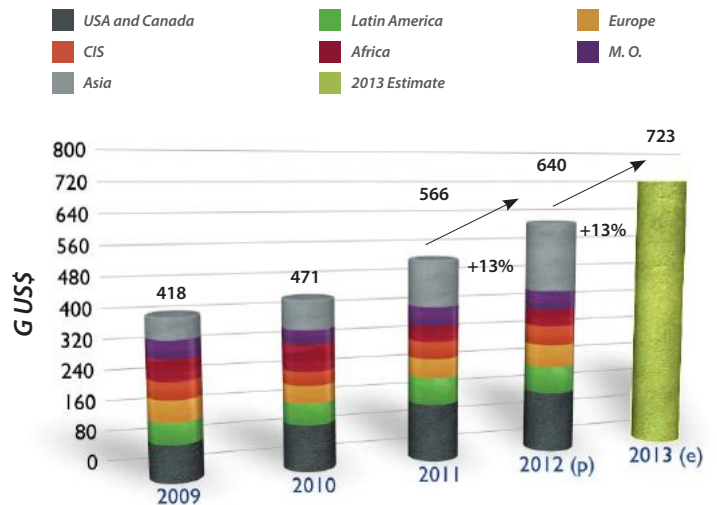
Concerning the advanced countries, only the United States experienced a GDP growth (2.3% against 1.8% in 2011) through the boom of the shale gas; the Euro zone was marked by a 0.4% recession in 2012 (against 1.4% in 2011) due essentially to the weakened economic circumstances of the south countries and the degradation of the sovereign debts. Also, the Japanese economy continues to show signs of slowing down with a 2% growth, attributable to the withdrawal of the exports. The emerging and developing countries, which continue to support the world investment, also showed signs of slowing down with a 5.1% growth against 6.3% in 2011. This decline was considerable in the big emerging countries (China, Brazil) with the reduction in their exports and in the domestic demand.

Besides, the geopolitical and the financial events led to strong fluctuations in oil prices and the average price of the barrel of the Brent reached a new record of 111.5 dollars.



In spite of this economic environment, the world investments in hydrocarbons exploration / production increased at a sustained pace, reaching a new \$640 billion record. All the regions experienced a growth of the E&P investments in 2012 with regard to 2011. It is in Europe where the growth is the strongest, where the investments shifted from \$13.6 G in 2011 to \$18.1 G (11.5 G£) in 2012, followed by Asia and by Latin America, with an increase of about 15 to 16%. The North America and the Middle East recorded the weakest growth: around 6%.

The activity would remain strong in 2013 with a growth rate of the order of 13%, supported by important projects and by the dynamism of the exploration.

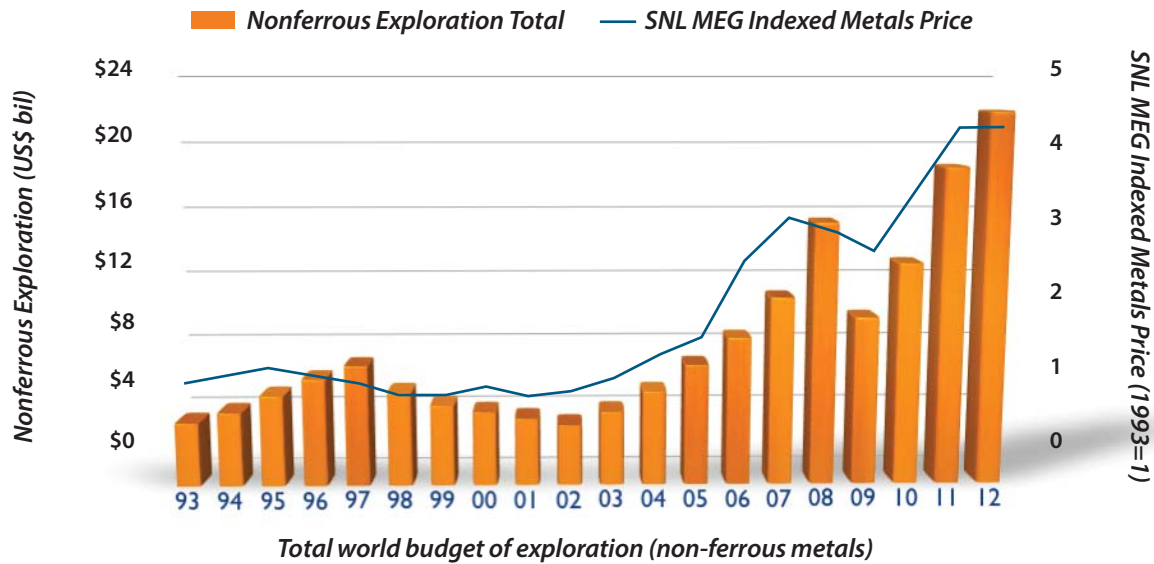


Global E&P investment in 2012

Source: IFP New Energies – October 2012



Regarding the mining sector, the world investments in mining exploration reached a new \$21.5 billion record (+ 19%). The emerging and developing countries will continue to support the demand on metals, regardless the concerns on the global economic growth.



Furthermore, the average prices of the basic metals declined in 2012, in spite of the recovery registered in the second half of this year. The average prices of Copper, Lead, Tin and Zinc decrease by 9.9%, 14.2%, 19.1% and 11.3% respectively, compared with 2011. As for the precious metals, the average price of gold increased by 6.1% during the year 2012, regardless the downward trend noticed at the beginning of the year. A recovery was recorded from the second half-year, related to the purchase of important quantities of the gold by the investors. Finally, the price of silver declined to 11.3% in 2012, in spite of the increase registered at the beginning of the year.

## National conjuncture

In a context marked by a downward trend of the world activity and an agricultural campaign below the average (reduction by 9.2% of the agricultural added value), the national economy knew a slowing down with an annual economic growth rate of 2.7%. On the contrary, the non-agricultural sector showed a rise of 4.8% so supporting the economic growth. The analysis of these data, by sector, shows however an acceleration of the sectors of fishing, services, aeronautics, automobile and offshoring. While, other sectors registered a decline of their growth rate, in particular the trade, the transport, the Posts and the Telecommunications and the BTP

Concerning the energy sector, after a net rise in 2011 (9.3%), the growth of the energy activities remained at a sustained pace in 2012 (9.5%). This growth is due to the dynamics of the electric activities (increase of the electric production), the increase of the electric consumption (7.4%) and the renewal of the refining activities.

The energy bill reached 104 billion dirhams (+15.5%) and the oil bill also registered 93 billion dirhams (+17%). As for the mining sector, the year 2012 was marked by a drop of 2.8% of the mining added value, after a 5.9% growth in 2011.

Mining, whose performance is closely linked to external markets, fell by 2.4% in 2012, due to lower phosphate output, which represents about 93% of the sector. Indeed, the phosphate market production stood at 27 million tonnes, down 3.5% after a 5.3% increase a year earlier.

The volume of crude phosphate exports almost stagnated as against a 7.8% decline a year ago, while their value grew by 1.7% to 12.8 billion dirhams.

*(Bank Al Maghrib)*

# HIGHLIGHTS

## Hydrocarbons

### Signature

- 2 new petroleum agreements
- 16 amendments to petroleum agreements
- 6 passage to additional periods
- 3 new reconnaissance contracts
- 4 addenda to reconnaissance contracts
- 3 memorandum of understanding (MOU)

### Acquisition

- 6 780.86 of Km<sup>2</sup> of 3D seismic
- 1 131.04 Km of 2D seismic

### Conducting

- 31 projects of follow-up of the partners
- 2 promotion projects for open acreage in onshore and offshore

### Completion

- Drilling operations of the MKL-110 well

### Connection

- Discoveries of the drilling campaign realized by Circle Oil company





# HIGHLIGHTS

## Mines

### Exploration

#### 18 ONHYM's own projects

- 8 for precious metals
- 7 for base metals and energy substances
- 3 for industrial rocks and minerals

#### 11 projects in partnership

- 4 for precious metals
- 4 for base metals
- 3 for industrial rocks and minerals

### Signature

- 1 amendment contract
- 3 protocole agreement
- 1 amendment
- 1 farmout agreement
- 2 research agreements
- 2 memorandums of understanding
- 1 contract for of a process' recovery development of ore in an acquisition
- 1 partnership agreement

## Organization

At the organizational level, a study of ONHYM's development strategy is underway and it is intended to ensure better use of mining and oil assets of the kingdom (excluding phosphates) and to capitalize on knowledge.

# PETROLEUM EXPLORATION

## Licensing

During 2012, the hydrocarbon exploration licensing was carried out on a total area of 431 029. 41 km<sup>2</sup> and included 44 onshore permits (including 13 specific to ONHYM), 67 offshore permits, 5 onshore reconnaissance permits, 2 off-shore reconnaissance permits and 10 exploitation concessions (including 2 specific to ONHYM). As of December 31<sup>st</sup>, 2012, the licensing domain is shown as follows:

		<b>Designation</b>
<b>Conventional hydrocarbons</b>	┌	Onshore Permits
	├	Onshore Permits
	├	Offshore Permits
	├	Onshore reconnaissance licenses
	├	Offshore reconnaissance licenses
	├	Exploitation concessions
	├	Exploitation concessions
	└	

## TOTAL

<b>Unconventional hydrocarbons</b>	3 companies are partners to ONHYM: 3 MOUs (Oil Shale)
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## TOTAL



ONHYM	In partnership	Area (Km <sup>2</sup> )
13		25 184,90
	31	40 431,85
	67	116 958,40
	5	140 422,80
	2	103 687,00
2		50,71
	8	53,85
		<b>426 789,51</b>
		4 239,90

**431 029,41**



## ONHYM OWN ACTIVITY

### Meskala and Toukimt fields development

The MKL-110 well, drilled on December 2011, reached a total depth of 3600 m in the Triassic sandstones and shale.

Two gas levels were detected in the Triassic reservoir with an interesting gas show as well as amplitude anomalies-related prospect, associated to the supra-dolerite reservoir.

### Play concepts of Boujdour Onshore coastal areas

Seismic interpretation and lithostratigraphic modeling confirmed the structure reached by the Hassi-Tartar 43-1. The source rock analysis, of the available wells of the area, show TOC values ranging from 1.16% to 4.71%.

### Play concepts of Rabat-Tarfaya offshore

The interpretation of 2D and 3D seismic data allowed the identification of several plays and leads as follows:

- Two play types were identified in the Mohammedia and El Jadida offshore zones: the first play is related to the carbonate platform and the second one is related to salt structures.
- Several leads have been identified in the Safi Deep offshore zone. These leads are related to four types of plays: salt-related plays, stratigraphic plays, tectonically inverted plays and Jurassic plays.
- Three types of plays were developed in the Essaouira Deep Offshore area: salt-related plays, stratigraphic plays and tectonically inverted plays
- Several leads have been identified in Agadir Offshore area. These leads are represented by salt-related structures, where the main targets are the Lower Tertiary, the Upper Cretaceous,

the Lower Cretaceous as well as the Miocene and the Lower Cretaceous channels (in the Albian and the Barremian). Other leads have been identified in the Jurassic; a study of these leads is underway.

Also, biostratigraphic, petrographic and petrophysical studies, along with geochemical analyzes of collected samples during the geological field work, have confirmed the presence of gas prone source rock and potential reservoir rocks of good quality in the Lower and the Upper Hauterivian.

### Play concepts of Dakhla offshore

The interpretation of 8 305 km of 2D seismic data delineated several plays and leads in the Dakhla Offshore area: the stratigraphic plays, the salt-related plays and the plays interpreted as being the Lower Hauterivian reef build ups. The potential source rock for these leads would be of Jurassic, and the cap rock could be represented by shale and marl of Upper Cretaceous and Tertiary.

The interpretation of the maturation maps at the top of the formations of the fictive wells in the Dakhla Offshore area shows a maturation trend from the East to the West. The gas window area tends to expand eastward with burial. The source rock is in the oil window according to the five fictive wells.

### Preliminary study on the extension of the Moroccan Atlantic Continental Shelf

This study, within the framework of the preparation of the technical file concerning the demarcation of the Moroccan Atlantic continental shelf, resulted in the development of a geological concept model of the Moroccan Atlantic Margin.

### Integrated infrastructure for CO<sub>2</sub> transportation and storage in western Mediterranean: COMET

The work realized within the framework of this project concerned the preparation of the documents related to the work program N°6 (WP6), the organization and the participation to the meeting of the Moroccan stakeholders as well as the participation to the 34<sup>th</sup> session of the International Geological Congress.



# ONHYM Exploration Activity 2012 Achievements

## Objectives:

- Atlantic continental shelf extension
- Delimitation of the extension of the continental shelf through Seismic studies
- Morphological and Geological study

## Rabat – Tarfaya Offshore

Objectives: Jurassic, Cretaceous & Tertiary Interpretation of 11 800 Km of 2D seismic and 3400 Km<sup>2</sup> of 3D seismic;

- Realisation of two field trips (03-14 April & 19-28 June 2012);
- Lithological and sedimentological studies in the Agadir-Essaouira segment. Regional geological synthesis

## Meskala-Toukimt

Objectives: Subsalt & TAGI reservoirs

- Development studies
- MKL-110 drilling campaign started the 01 December 2011, final depth at 3 600 m.

## Boujdour onshore North & South

Objectives: Jurassic & Cretaceous

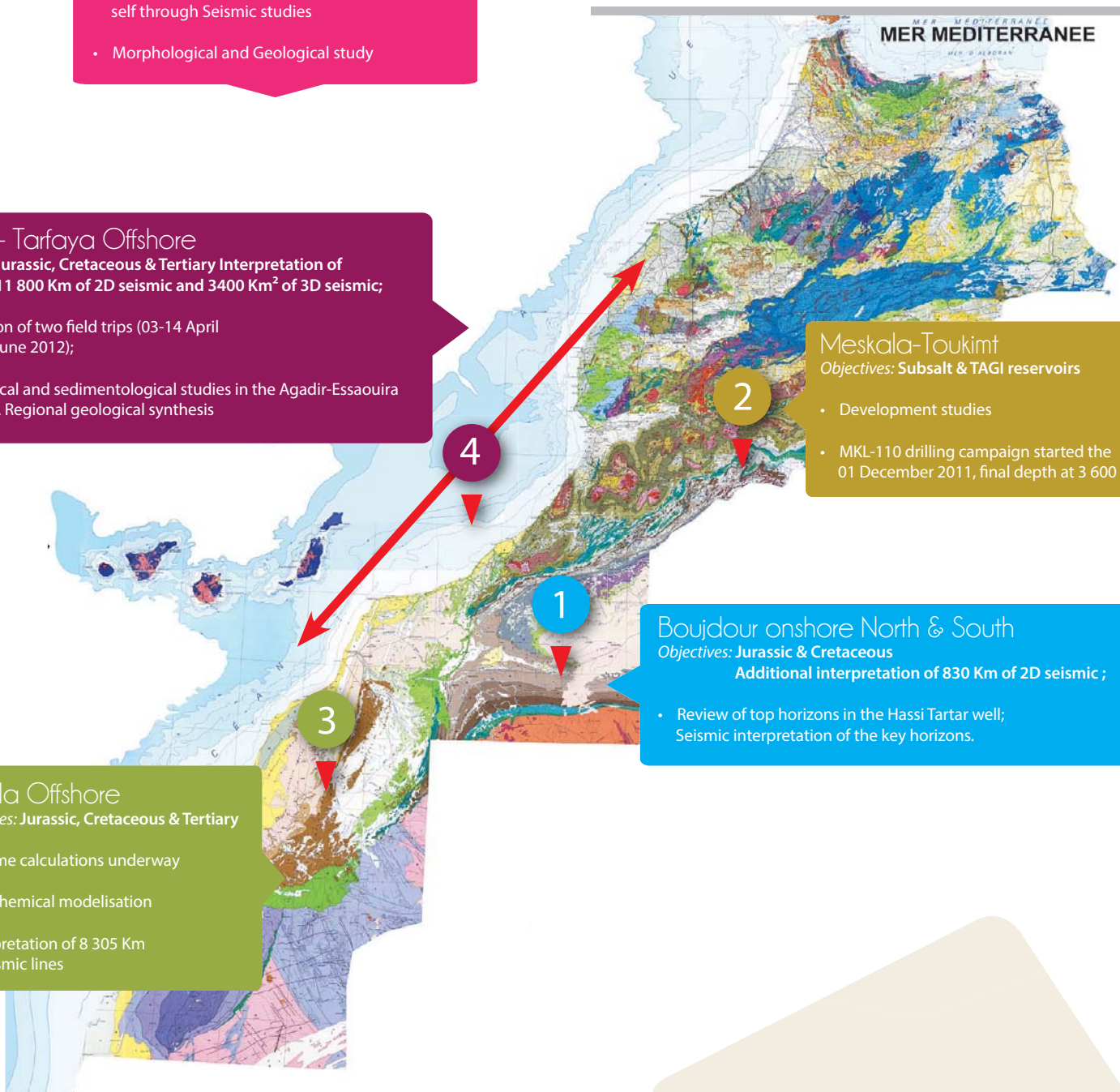
Additional interpretation of 830 Km of 2D seismic ;

- Review of top horizons in the Hassi Tartar well; Seismic interpretation of the key horizons.

## Dakhla Offshore

Objectives: Jurassic, Cretaceous & Tertiary

- Volume calculations underway
- Geochemical modelisation
- Interpretation of 8 305 Km of seismic lines





## PARTNERS ACTIVITY

## Offshore Zones

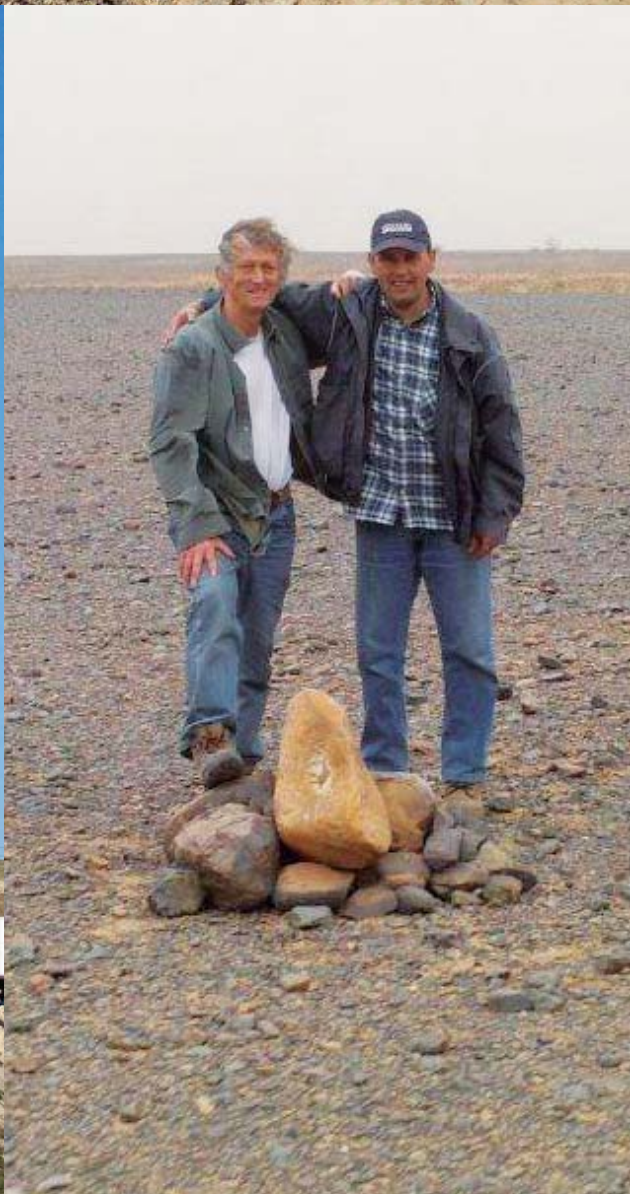
ZONES	PARTNERS	PERMITS	ACTIVITY
<b>Tanger-Larache Offshore</b>	Repsol Exploracion, Dana Petroleum & Gas Natural Exploracion	Reconnaissance License	<i>Realization of a sedimento- logical model including data from the Anchois-1, Dorade -1 &amp; Merou -1 wells.</i>
<b>Gharb Offshore</b>	Repsol Exploracion S.A	Reconnaissance License	<ul style="list-style-type: none"> <li>• Processing of 3 099 km of 2D seismic data;</li> <li>• Basin modeling, and identification of some play concepts in the Cretaceous and the Jurassic.</li> </ul>
<b>Loukos Offshore</b>	MPE	Exploration permit	<i>Reprocessing of seismic lines.</i>
<b>Casablanca Offshore &amp; Safi Offshore I</b>	MPE	Exploration permit	<i>Farm out campaign.</i>
<b>Rabat Deep Offshore</b>	Chariot Oil & Gas	Exploration permit	<i>Starting up of the reprocessing of 2D seismic and preliminary evaluation.</i>
<b>Mazagan Offshore</b>	Pura Vida	Exploration permit	<i>Reprocessing and interpretation of 3 000 Km<sup>2</sup> of 3D seismic data; study of the petroleum potential of the block and interpretation of 3D seismic. Source rock analysis of Lower Jurassic shales in Canarian Islands (Fuerteventura). Identification of 13 prospects &amp; leads mapped in the Tertiary, the Lower Cretaceous &amp; the Jurassic.</i>

ZONES	PARTNERS	PERMITS	ACTIVITY
<b>Essaouira Offshore</b>	Kosmos/Canamens	Exploration permit	<ul style="list-style-type: none"> <li>• Reinterpretation of available 2D seismic data;</li> <li>• Identification of 3 types of plays concepts. Acquisition, interpretation &amp; preliminary mapping of a 3D seismic campaign.</li> </ul>
<b>Tarhazoute Offshore</b>	Kosmos	Exploration permit	Identification of 5 leads & prospects.
<b>Foum Assaka</b>	Kosmos/Pathfinder	Reconnaissance License	Preliminary interpretation of the newly acquired 3D seismic data & identification of fifty leads in the Cretaceous & the Tertiary.
<b>Sidi Moussa Offshore</b>	San Leon, Serica B.V & Longreach,	Exploration permit	Identification of 14 leads.
<b>Foum Draa Offshore</b>	San Leon, Serica B.V & Longreach	Exploration permit	Mapping of 5 prospects & leads.
<b>Juby Maritime</b>	Nautical/Barrus	Exploration permit	Identification of 10 prospects & leads in the Jurassic and the Cretaceous.
<b>Tarfaya Offshore</b>	DVM (Tangiers Petroleum)	Exploration permit	<ul style="list-style-type: none"> <li>• Realization of source rocks geochemical studies.</li> <li>• Mapping of nine prospects &amp; leads.</li> </ul>
<b>Boujdour offshore shallow</b>	Teredo	Exploration permit	Identification of prospects and leads.
<b>Cap Boujdour Offshore</b>	Kosmos	Exploration permit	Reprocessing and interpretation of 3D seismic data, identification & mapping of 3 prospects in the Lower Cretaceous.
<b>Anzarane Offshore</b>	Total	Reconnaissance License	<ul style="list-style-type: none"> <li>• Development of a potential play concept in the Cretaceous.</li> <li>• 3D seismic acquisition is underway.</li> <li>• Seabed sampling showed gas traces in the deepest part of the basin and oil traces on the slope.</li> </ul>

## PARTNERS ACTIVITY

## Onshore Zones

ZONES	PARTNERS	PERMITS	ACTIVITY
<b>Gharb South&amp; Gharb Centre</b>	Cabre	Exploration permit	<ul style="list-style-type: none"> <li>• Acquisition of 306 km<sup>2</sup> of 3D seismic.</li> <li>• Well testing of the BFD-1 well. Seismic interpretation of the pré rifaines ridges area.</li> </ul>
<b>Sebou</b>	Circle Oil	Exploration permit	Processing of 16.8 Km <sup>2</sup> of 3D seismic data & 21.8 Km of 2D seismic data.
<b>Lalla Mimouna</b>	Circle Oil	Exploration permit	<ul style="list-style-type: none"> <li>• Processing and interpretation of 109 Km<sup>2</sup> of 3D seismic data; AVO and seismic inversion processing.</li> <li>• Identification of 40 amplitude anomalies in the Tertiary.</li> </ul>
<b>Fès</b>	Cabre	Exploration permit	Elaboration of a preliminary program for the acquisition of 1000 km of 2D seismic data in order to test the newly identified structures.
<b>Haha 1 - 3</b>	PEL	Exploration permit	<ul style="list-style-type: none"> <li>• Identification of sub and post salt structures respectively in the Triassic and Jurassic;</li> <li>• Selection of a salt-related structure in Tamanar area (Haha 3) for the drilling test.</li> </ul>
<b>Sidi Mokhtar North, South&amp;west</b>	MPE/Longreach	Exploration permit	<ul style="list-style-type: none"> <li>• Interpretation and development of the Triassic concept. Modelisation &amp; mapping of an identified structure in the Paleozoic.</li> <li>• Achievement of the processing of 1588 Km of 2D seismic data.</li> <li>• Mapping of the top Triassic &amp; identification of 14 leads &amp; prospects.</li> </ul>

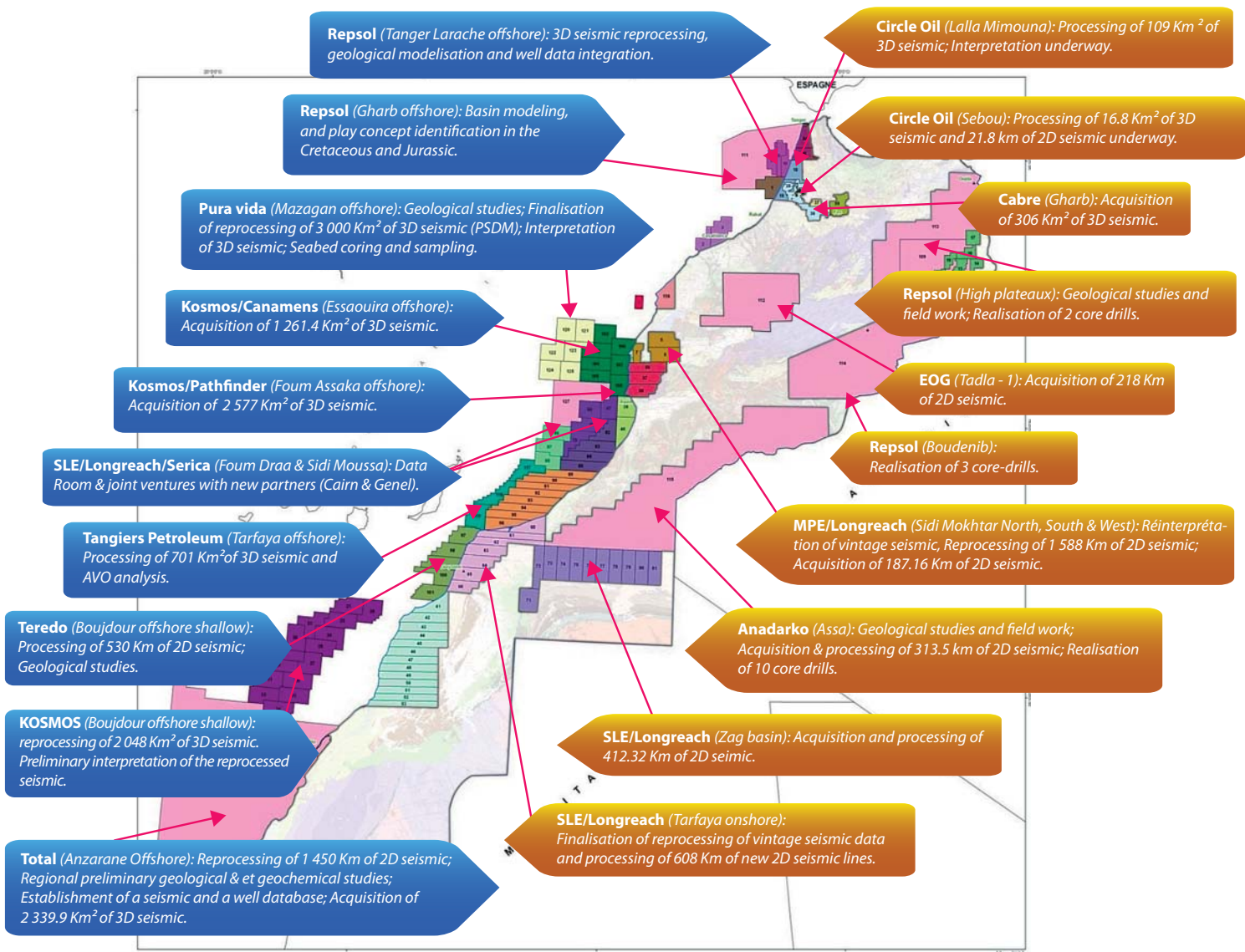


ZONES	PARTNERS	PERMITS	ACTIVITY
<b>Tendrara</b>	MPE	Exploration permit	<ul style="list-style-type: none"> <li>• Geological and geophysical studies, reinterpretation of 3D data.</li> <li>• Simulation study is underway.</li> </ul>
<b>Tendrara South</b>	MPE	Reconnaissance License	Submission of the report related to the sismostructural and sismostratigraphic studies of the triassic formations.
<b>Missour East 1</b>	MPE	Reconnaissance License	Resuming of the petroleum re-evaluation of the area.
<b>Zag Basin</b>	San Leon & Associates	Exploration permit	<ul style="list-style-type: none"> <li>• Demining and acquisition of 412.32 Km of 2D seismic data. Processing and interpretation of 1 674.54 Km of 2D seismic data.</li> <li>• Identification of prospects in the Devonian and Ordovician.</li> <li>• Volumetric and risk analysis underway.</li> </ul>
<b>Tarfaya Onshore</b>	San Leon & Associates	Exploration permit	<ul style="list-style-type: none"> <li>• Processing and interpretation of 608 Km of the newly acquired 2D seismic.</li> <li>• Identification of play concepts in the Triassic, Jurassic and Cretaceous and identification of 14 prospects and leads.</li> </ul>
<b>Doukkala</b>	East West Petroleum	Exploration permit	Confirmation of the Paleozoic and Triassic petroleum potential of the Doukkala basin.
<b>Tadla</b>	EOG	Reconnaissance License	<ul style="list-style-type: none"> <li>• Geological study, reprocessing and interpretation of 611 km of 2D seismic.</li> <li>• Evaluation study and acquisition of 218 Km of 2D seismic.</li> </ul>

ZONES	PARTNERS	PERMITS	ACTIVITY
<b>Hauts Plateaux</b>	Repsol	Reconnaissance License	<i>Realization of two core drills: JRN-1, JRS-1 and logging.</i>
<b>Boudenib</b>	Repsol	Reconnaissance License	<ul style="list-style-type: none"> <li>• <i>Realization of three 3 core drills: WLN-1, FZN-1 and EF-1.</i></li> <li>• <i>Geological field work and geochemical sampling in order to locate the positions of the next 4 core drills (2013).</i></li> </ul>
<b>Assa</b>	Anadarko	Reconnaissance License	<ul style="list-style-type: none"> <li>• <i>Finalization of the environmental impact study.</i></li> <li>• <i>Reprocessing and interpretation of the vintage seismic data (1 260 Km).</i></li> <li>• <i>Acquisition, processing and interpretation of 313.58 Km of 2D seismic data.</i></li> <li>• <i>Realization of 10 core drills ranging from 30 to 370 m.</i></li> <li>• <i>Finalization of a preliminary study on the socio economic impact of the project.</i></li> </ul>
<b>Haouz</b>	Vermillon	Reconnaissance License	<ul style="list-style-type: none"> <li>• <i>Sampling and geochemical analysis for 254 potential source rock intervals.</i></li> <li>• <i>Mineralogical and stratigraphical study.</i></li> </ul>



# Partners petroleum exploration activities in 2012



# PETROLEUM PARTNERSHIPS & COOPERATION

The year 2012 knew an unprecedented popularity due to the growing interest of oil companies for the exploration of the Moroccan sedimentary basins.

This year was marked by signing:

- 2 new petroleum agreements;
- 16 amendments of petroleum agreements;
- 6 entries into extension period as part of petroleum agreements;
- 3 new reconnaissance contracts;
- 4 addenda to reconnaissance contracts;
- 3 MOUs.



**In 2012, hydrocarbons licensing covered a total area of 431 029.41 Km<sup>2</sup> distributed as follows:**

## CONVENTIONAL HYDROCARBONS

**426 789.51 Km<sup>2</sup>** distributed as follows:

### In partnership

**27** companies are partners to ONHYM through petroleum agreements and reconnaissance contracts covering a total area of **401 553.90 km<sup>2</sup>**.

Licensing domain is managed by:

- **24** petroleum agreements covering **98** exploration permits with a total area of **157 390.25 Km<sup>2</sup>**
- **8** operating concession covering an area of **53.85 Km<sup>2</sup>**
- **7** Reconnaissance Licenses with a total area of **244 109.80 Km<sup>2</sup>**

## ONHYM

Licensing domain specific to ONHYM covers a total area of **25 235.61 Km<sup>2</sup>** including:

- **13** permits onshore covering an area of **25 184.90 Km<sup>2</sup>**
- **2** exploitation concessions with a total area of **50.71 Km<sup>2</sup>**

## UNCONVENTIONAL HYDROCARBONS

**3** companies are partners to ONHYM within **3** MOUs relating to oil shale covering a total area of **4 239.90Km<sup>2</sup>**.



## PETROLEUM AGREEMENTS

ZONES	PARTNERS	WORK EXPECTED
<b>Mir Left Offshore</b>	Genel Energy Limited	<ul style="list-style-type: none"> <li>• Drilling of one exploratory</li> <li>• Acquisition of 3D seismic</li> <li>• G&amp;G work.</li> </ul>
<b>Rabat Deep Offshore</b>	Chariot Oil and gas Invest (Morocco Limited)	<i>Reprocessing and reinterpretation of all 2D available seismic data and G&amp;G work.</i>



## AMENDMENTS TO PETROLEUM AGREEMENTS

ZONES	PARTNERS	WORK EXPECTED
<b>Zag basin</b>	San Leon (Morocco) LTD/Longreach oil and Gas ventures Limited	<i>Processing and interpretation of 1674 km of 2D seismic data acquired on this block.</i>
<b>Tarfaya Onshore</b>	San Leon Morocco B.V/Longreach Oil and Gas Ventures Limited	
<b>Foum Assaka Offshore</b>	Kosmos Energy Deep Water Morocco/ Pathfinder Hydrocarbon Ventures Limited	<i>Transfer of 50% of Pathfinder parts to Kosmos in the « Foum Assaka Offshore I - IV » permits.</i>

ZONES	PARTNERS	WORK EXPECTED
<b>Casablanca Offshore</b>	MPE	<i>Extension for 12 months of the initial validity period of the permits « Casablanca A », « Casablanca B » and « Safi Offshore I » to 11/01/2013 to finalize ongoing work.</i>
<b>Casablanca Offshore</b>	MPE	<i>Extension for 6 months of the initial validity period of the permits to 11/07/2013 and transfer of 100% of MPE parts to Chariot.</i>
<b>Loukos Offshore</b>	MPE	<i>Extension for 12 months of the initial validity period of the permit « Loukos Offshore I » to 11/01/2013 to finalize ongoing work.</i>
<b>Loukos Offshore</b>	MPE	<i>Extension of 6 months of the initial validity period of the permits to 11/07/2013 and transfer of 100% of MPE parts to Chariot.</i>
<b>Haha</b>	PEL	<i>Extension of 18 months of the initial validity period of the permits, and modification in the work program relating to the initial validity period, and to the first extension period in order to drill one well to explore the triassic reservoir.</i>
<b>Gharb</b>	Cabre Maroc Limited	<i>Modification of the work program and extension of 12 months of the first extension period.</i>

ZONES	PARTNERS	WORK EXPECTED
<b>Foum Draa Offshore</b>	San Leon (Morocco) LTD/Longreach oil and Gas ventures Limited/Serica Foum Draa BV	<i>Modification of the work program and extension of 8 months of the initial validity period..</i>
<b>Foum Draa Offshore</b>	San Leon (Morocco) LTD/Longreach oil and Gas ventures Limited/Serica Foum Draa BV	<i>Transfer of 66,66% of San Leon, Serica and Longreach parts to Capricorn and extension of 3 months of the initial validity period of the permits.</i>
<b>Sidi Moussa Offshore</b>	San Leon (Morocco) LTD/Longreach oil and Gas ventures Limited/Serica Sidi Moussa BV	<i>Extension of 20 months of the initial validity period of the permits.</i>
<b>Sidi Moussa Offshore</b>	San Leon (Morocco) LTD/Longreach oil and Gas ventures Limited/Serica Sidi Moussa BV	<i>Transfer of 80% of San Leon, Serica and Longreach parts to Genel and extension of 3 months of the initial validity period of the permits.</i>
<b>Sidi Moktar</b>	MPE/Longreach oil and Gas ventures Limited /	<i>Extension of 12 months and modification of the minimum exploration work program of the initial validity period of the permit.</i>
<b>Essaouira Offshore</b>	Kosmos Energy Deep Water Morocco/ Canamens Energy Morocco SARL	<i>Transfer of 100% of Canamens parts to Kosmos.</i>
<b>Cap Boujdour Offshore</b>	Kosmos Energy Deep Water Morocco	<i>Extension of 12 months of the initial validity period of the permits.</i>

## PASSAGE TO ADDITIONAL PERIODS AS PART OF PETROLEUM AGREEMENTS

ZONES	PARTNERS	WORK EXPECTED
<b>Boujdour Offshore Shallow I -V</b>	Teredo Morocco Limited	<i>Acquisition of 3D seismic and drilling of one exploration well.</i>
<b>Tarfaya Onshore 1 - 7</b>	San Leon Morocco B.V/Longreach Oil and Gas Ventures Limited	<i>Drilling of one exploration well and acquisition of 3D seismic in case of positive results.</i>
<b>Zag Basin 1 - 11</b>	San Leon Morocco LTD/Longreach Oil and Gas Ventures Limited	<i>Drilling of one exploration well and G&amp;G studies.</i>
<b>Sidi Moussa Offshore 1 - 4</b>	Genel Energy Limited/San Leon Energy PLC/Longreach Oil and Gas Ventures Limited/Serica Sidi Moussa BV	<i>Drilling of one exploration well and acquisition of 300 km<sup>2</sup> of 3D seismic and G&amp;G studies.</i>
<b>Foum Draa Offshore 1 - 3</b>	Capricorn Exploration and Development company Limited/San Leon Energy PLC/Longreach oil and Gas Limited/Serica Foum Draa BV	—
<b>Tarfaya Offshore I - VIII</b>	DVM International Sarl	—

## RECONNAISSANCE CONTRACTS

ZONES	PARTNERS	WORK EXPECTED
<b>Tadla I</b>	EOG	<i>G&amp;G studies and acquisition, processing and interpretation of 200 km of 2D seismic.</i>
<b>Tanger-Larache Offshore</b>	Repsol exploracion/Dana petroleum (E&P) Limited/Gas Natural Exploracion S.L	<i>Reprocessing of 3D seismic and G&amp;G studies.</i>
<b>Haouz</b>	Vermillion Morocco Exploration B.V	<i>Reprocessing of 2D seismic data and G&amp;G studies.</i>



## ADDENDA TO RECONNAISSANCE CONTRACTS

ZONES	PARTNERS	WORK EXPECTED
<b>Boudenib</b>	Repsol Atlas Exploracion SA	<i>Extension of 12 months of the initial validity period of the reconnaissance contract to 21/08/2013.</i>
<b>Hauts Plateaux</b>	Repsol Atlas Exploracion SA	<i>Extension of 12 months of the initial validity period of the reconnaissance contract to 21/08/2013.</i>
<b>Assa</b>	Anadarko Morocco Assa company	<i>Extension of 12 months of the initial validity period of the reconnaissance contract to 27/09/2013.</i>
<b>Anzarane Offshore</b>	Total E&P Maroc	<i>Extension of 12 months of the initial validity period of the reconnaissance contract to 01/12/2013.</i>

## OTHER AGREEMENTS

ZONES	PARTNERS	AGREEMENT
« Cap Rhir Deep Offshore » and « Cap Cantin Deep Offshore ».	Chevron Global Energy INC	MOU to petroleum agreements
« Tarfaya & Timahdit ».	Global Oil Shale	MOU oil shale
Tarfaya West Flank (Permis 17 - 31)	IES IRKOUTSKENERGOSTROY – Maroc Sarl	MOU oil shale
Tarfaya South Area	San Leon Energy PLC	MOU oil shale



# PETROLEUM DRILLING & PRODUCTION

## OIL DRILLING AND DEVELOPEMENT

### Drilling activity

Drilling activity specific to ONHYM were marked by the achievement of the drilling campaign of the well MKL-110 to the final depth of 3 600 m in the Essaouira basin. An intervention program to control the presence of gas in the annular space is underway.

### MKL-110 well development

Preparations are underway to connect the well MKL-110 to the gas processing unit in Meskala.

### Meskala field simulation study

Completion of the first simulation study and start of the second simulation study.

## HYDROCARBON PRODUCTION

### Exploitation

Focused on the two fields of Essaouira and Gharb, this activity was also characterized by the commissioning of the new pipeline 8" for the commercialization of the discoveries made in the partnership between Circle Oil and ONHYM.

### ” Marketing

The total turnover, generated by hydrocarbon sales in 2012 reached 160.14 Million of DH with an increase rate of 16.23% compared to the year 2011. This improvement is mainly due to continued consumption from OCP, the improvement of Super Cerame consumption and rising prices of N°2 fuel and oil. “

## OIL SHALE

During the year 2012, the activities related to oil shale focused on the following events:

- Presentation by the company Taqa of the results of the feasibility study on the treatment of Tafaya oil shale in the western flank;
- Signing of the MOU extension with the company San Leon;
- Implementation of the « Fisher Test » and shale laboratory material and accessories;
- Approval, with OCP, of the report relating to the phase 1 exploration project for Tadla and El Borouj areas;

## MAGHREB EUROPE GAS PIPELINE (MEG)

As part of its mission of fee management on behalf of the State for the gas supply through our country, ONHYM monitors the follow-up of the daily, weekly and monthly gas supply, as well as the planning of the ONEE consumption.

# MINING EXPLORATION

## The mining exploration in 2012 concerned 18 ONHYM's own projects including:

- 8 for precious metals
- 7 for base metals and energy substances
- 3 for industrial rocks and minerals

## Activity in partnership has interested 11 projects including:

- 4 for precious metals
- 4 for base metals
- 3 for industrial rocks and minerals

## In 2012, a research agreement was signed with the Canadian company Pham on Tichka Est project.

## ONHYM'S OWN ACTIVITY

### PRECIOUS METALS

#### Twihinate (REE, Nb, U, Mo, Au)

A new drilling campaign consisting of 9 core drills confirmed the interesting results of the previous one. The resources of the central part were reassessed and gave 350 million tonnes at 0.41% Nb<sub>2</sub>O<sub>5</sub> and 0.49% REE. In the Laknouk area located west of the Twihinate structure, recognition by geological mapping and sampling of structures is continuous.

The sampling performed confirmed the presence of gold with grades ranging between 1 and 11 g/t on metric thicknesses. Trenches totaling 120 m<sup>3</sup> were performed and confirmed the root of these structures on metric thicknesses. The chemical analytical result showed gold grades ranging between 1.3 and 16 g/t.

#### Lamlaga (Fe, Nb, U, REE)

An additional gravity survey confirmed the presence of heavy anomalies that could correspond to the depth continuity of the gold and molybdenum mineralized structure. A geochemical soil sampling over a large part

of the periphery of the structure will be carried out to delineate potential anomalous zones of gold and molybdenum. A 4th drilling program totaling 811.6 m was performed to better assess the REE, Mo and Au mineralization, identified in an argilic facies located on the peripheral ring. The preliminary resource estimation made on the basis of the first three drilling campaigns, evaluates the deposit to 690 million tonnes at 0.74% (sum of LREE), 0.26% Nb<sub>2</sub>O<sub>5</sub> on an average thickness of 57 m.

#### Drag Al Farnan (Nb, Ta, U, REE)

The research done focused on the carbonatite massifs of Glibat Drag and Gleyb Al Farnan. 15 core drills were conducted totaling 1 229 m with 926 m distributed over 11 drills carried out at Glibat Drag.

A preliminary resource assessment at Drag Al Farnan gave a tonnage of around 47 million tonnes at 0.2% Nb<sub>2</sub>O<sub>5</sub>, 280 ppm Ta<sub>2</sub>O<sub>5</sub>, 240 ppm U<sub>3</sub>O<sub>8</sub> and 0.23 ppm Light Rare Earth Elements.

These resources are associated with those of Glibat Lafhouda located in the same district and bring the global resources to 96 million tonnes at 0.3% Nb<sub>2</sub>O<sub>5</sub>, 272 ppm Ta<sub>2</sub>O<sub>5</sub>, 400 ppm U<sub>3</sub>O<sub>8</sub> and 0.2 ppm Light Rare Earth Elements.





### **Twirga Amwaga (Platinoids)**

The research was carried out in the light of the results of the regional soil geochemistry survey. The anomalies were controlled by geological mapping, detail soil geochemistry and rock sampling (783 samples collected). The grades obtained are up to 261 ppb platinum and 42 ppb palladium in microdolerite and up to 320 ppb platinum in serpentine.

### **Lahjira A I Bayda (REE, Nb, Mo, Au)**

Reconnaissance work on this structure was started in 2012 by geological mapping at 1/5 000 of an area of 8 km<sup>2</sup> and rock sampling with collection of 350 samples. A geophysical survey was carried out by gravity over an area of 1 km<sup>2</sup> and has highlighted a significant gravity anomaly. A systematic sampling of all structures of the area totaled 270 samples for chemical analysis.

### **Assif Mqourn (Au)**

In the Assif Mqourn sector, trenches completed in 2011 on the main structure yielded grades ranging from 1 to 8.7 g/t Au of over metric thicknesses with an exceptional grade of 60.7 g/t Au. 7 core drills totaling 508.10 m have all intercepted the targeted structure at depths varying between 20 and 78 m, with thicknesses of 1 to 3 m and grades not exceeding 0.5 g/t Au.

## GENERAL RESEARCH (Precious Metals)

### **South Zone (RG-SZS)**

General research for platinoids in the Awserd province continued and concerned the axial zone of the Adrar Souttoug chain. Geological control of soil geochemical anomalies continued in the South of Glibat Lafhouda by mapping at 1/25 000 of an area of 20 km<sup>2</sup> and sampling of the favorable structures. Meanwhile a radiometric survey was carried out and allowed to highlight radiometric anomalies in silicified facies that were sampled.

### **Anti-Atlas (RG-SAA)**

The general research was focused on the North of the

Tamlalt inlier (Jbel Lahouanit sector, Figuig province). In the area of Jbel Lahouanit, geological reconnaissance was carried out; two types of structures that could be potentially mineralized were observed in the studied area. In the region of Ait Nbdas, the geological reconnaissance was carried out to control hyperspectral anomalies detected in this area.

In the Imagrane region, the work done consisted on geological mapping at 1/25 000 and the sampling of ferruginous silica structures hosted in Acadian shales in the Agoudim sector. The quartz structures show copper mineralization in some places (malachite and azurite).

## BASE METALS

### **Tafer Tarmilat (Sn, W)**

The work continued in the area by carrying out geological mapping at 1/1 000 (1 km<sup>2</sup>) and soil sampling in the granitic arena for the research of lateral extensions of the placers already defined.

The Nasseh Bou lead show, located in the west of the sector, has been the subject of geological mapping and rock sampling in quartz veins.

### **Copper GR (Cu)**

In the areas of Iraouene-Mouzarif, the geological reconnaissance allowed locating several copper mineralized structures.

A geological survey of the Tafraout copper show, located in central High Atlas, was carried out and surface sampling revealed the presence of a copper mineralization with chalcopyrite in gabbros grading up to 5.6% Cu and an iron mineralization in veins and structures of magnetite grading up to 71% Fe

### **Mfis (Ni, Co)**

The results of chemical analysis of the samples collected from the rubble of old wells indicate that the mineralization is mainly of Pb-Zn with several relatively high grades, exceeding 10% for Pb and from 1 to 10% for Zn.

The lead mineralization is high silver content with concentrations ranging from 20 to 325 ppm Ag. The copper grades are generally lower, ranging between 0.1 and 0.6%, but may locally exceed 1%. The Ni contents do not exceed a few hundreds of ppm.

The geophysical survey done by magnetic and induced polarization has confirmed the continuity of a long wide vein structure that has a relatively high chargeability suggesting the entrenchment of mineralization at depth.

#### **Tassent (Cu, Ni)**

At Tassent in the central High Atlas, the results of chemical analysis of the sampling carried out on the Cascade show, gave copper grades ranging from 0.04 to 1.17% with a content of 107 ppb palladium, and Ni content that do not exceed 500 ppm. Otherwise, the results of chemical analysis of the sampling performed on the Anefgou show, gave significantly better grades, ranging from 0.5 to 2.2% Ni, 0.8 to 2.1% Cu, from 24 to 63 ppb Pd and from 32 to 64 ppb Pt.

#### **Aghracha (U, REE)**

A preliminary resource estimation of the uranium in carbonite calcrètes gave about 19.2 million tonnes at 157 ppm U<sub>3</sub>O<sub>8</sub> with an average thickness of 1.24 m or 6.6 Mlbs U<sub>3</sub>O<sub>8</sub>. In addition, the drill hole ACH4 conducted in Laachariyat carbonatites gave 0.3% REE on an average thickness of 9m, at a depth of 46.7m.

The first results of the trenching achieved in highly radioactive pegmatites show contents of U<sub>3</sub>O<sub>8</sub> from 37 to 778 ppm and LREE ranging from 0.3 to 7.2%. A drilling campaign (1 000 m) is scheduled for the year 2013.

#### **Zone Sud (U)**

Eight airborne radiometric anomalies in Imlily and Dakhla sectors have been the subject of ground control by establishing counter plan at 1/25 000 and geological mapping at 1/25 000.

A total of 97 samples were collected from different facies for chemical analysis that show grades ranging between 120 and 470 ppm U<sub>3</sub>O<sub>8</sub>. In addition, preliminary results of work in the Al Faj and Lahjayra Al Beida regions show grades reaching 443 ppm U<sub>3</sub>O<sub>8</sub>.

#### **Matallah (U, Cu, Ni, Fe)**

The work carried out on the sector of Togba consisted on a drilling campaign of 39 core drills totaling 295 m in order to recognize the lateral and vertical development of uranium calcretes of this sector. The cores are being sampled.



## GENERAL RESEARCH (Base Metals)

In the Oujda region, lead shows of Sidi Bou Said, Guenfouda and Jbel Aourir have been the subject of geological mapping and sampling. Shows of Sidi Bou Slimane and Aouija correspond to a lead-copper mineralization located along north-south and east-west faults, in contact with the Shale basement.

## INDUSTRIAL ROCKS and minerals (IRM)

### **Ad Doukat (Fibrous clays)**

In the Ad Doukat sector, a campaign of 4 core drills totaling 237.5 m was performed to recognize the roots of fibrous clays of the sector. All the drills intersected carbonate absorbent clays with attapulgite on thicknesses exceeding 40 m.

### **Jbel Zerhoun (Feldspars, kaolin)**

Five core drills totaling 304.6 m were performed to recognize the extensions and rootedness of the kaolinized sandstones and proceed to their technological characterization. These drills have intercepted clay sands with feldspar on a thickness exceeding 50 m. Most drills were stopped by intercepting sand and sandstone levels rich in organic matter.

The first chemical analysis and identification results show that the fraction less than 100  $\mu$  is composed of kaolinite, feldspar and quartz with traces of calcite and dolomite.

### **Bled Rmel (Fibrous clays)**

In the area of Bled Rmel, the geological mapping and sampling carried out have located levels of Eocene marl containing sepiolite and attapulgite with a thickness of 250 m. 5 core drills totaling 214.30 m were completed and have intersected very absorbent gray clays.

## **GENERAL RESEARCH (Industrial Rocks and Minerals)**

In the framework of general research, a preliminary re-

connaissance was initiated in Boudinar basin (province of El Hoceima) for the research of diatomite. Six levels of white diatomite were located in the Ras Tarf region which were sampled with the collection of 57 samples that are being analyzed.

## STRATEGIC RESEARCH

### **General Research Geochemistry Southern Provinces**

Under Geochemistry General Research in the Southern Provinces, the work done consisted on soil geochemistry on an area of 120 km<sup>2</sup>; 102 soil samples, 48 rock samples and 20 samples of different facies for petrographic studies were collected.

In addition, a BLEG geochemistry test was conducted in the area; 9 samples around known gold shows (Lafwillia and Laknouk) in the province Awserd, were collected. The results were positive. In parallel, a counter plan by scintillometry was made with the implementation of 35 radiometric profiles that gave values ranging from 350 to 2 630 c/s.

### **Airborne geophysical Survey AFMAG**

In a context where geophysical tools are in development to discover new hidden deposits, an airborne geophysical campaign AFMAG was carried out in the western Anti-Atlas by external service for the research of copper mineralization located in paleoreliefs under the carbonate cover.

A preliminary processing was performed and a preliminary report was delivered.

### **Airborne hyperspectral campaign**

Hyperspectral campaign was carried out in the inliers of Kerdous and Bas Draa from April 2012. The work of the first phase consisting on field data acquisition is completed. The first analysis of alteration maps of specific zones has identified three potential target areas of interest.

## ACTIVITY IN PARTENERSHIP

## ZONE

Jebilet

## SUBSTANCES

Zn-Pb-Cu-Ag

## PARTNER

CMG

## WORKS

*Realization of 8 core drills totaling 2 216m on Benslimane deposit that intersected mineralized horizons between -100 and -150m, on thicknesses between 2 and 8m, with copper grades between 0.6 and 0.87%. Indicative Cu and Au grades were also identified in the BS19 drill hole; 5m at 0.11% Cu, 0.4 ppm Au and 7 g/t Ag.*

*Realization of 3 043m drilling on the prospects of Jbel Haimeur and Roc Blanc and the analytical results are pending.*

## ZONES

Tekna

## SUBSTANCES

Zn-Pb-Cu-Ag

## PARTNER

CMG

## WORKS

*Realization of a vertical drill hole (MASC1) totaling 814m on an electric anomaly (MMP) in Moulay El Amine sector.*

*After 341m of the Plio-Quaternary cover, MACS1 crossed formations of the hanging wall serie of the mineralization with quartz veins (0.4 to 1.5m) rich in pyrrhotite and sphalerite.*

*The drill hole deviated much in direction and dip.*

## ZONES

Tafrent

## SUBSTANCES

Au

## PARTNER

ARCHEAN GROUP

## WORKS

*Archean Group charged the company MDM Engineering in South Africa to carry out the design of processing facilities of Tafrent gold deposit. A surface sample of approximately 300kg and another of a hundred kilos from the core drills were used for a gravimetric concentration test, study of the parameters of the cyanidation, tests for the determination of the energy consumed in crushing and grinding, and the determination of the abrasivity of the ore. MDM also completed the design of the plant and all necessary facilities.*

## ZONE

Zone sud

## SUBSTANCES

Precious &amp; Base Metals

## PARTNER

METALEX

## WORKS

*Airborne geophysical survey, magnetic and spectroradiometry, conducted by the Canadian company Goldak Airborne Ltd. Processing and interpretation of the airborne survey results Geological control of airborne anomalies. A total of 428 samples were collected. Partial results of samples collected at certain anomalies are encouraging.*

## ZONE

Ighrem Sector

## SUBSTANCES

Cu

## PARTNER

MANAGEM

## WORKS

*Tizert sector: Track Access: 22km; topographical surveys, drills (14 reverse circulation drills (2 532m), 25 percussion drills (4 485m) and 3 core drills (687m)). At Tizert East, mineralization is mainly hosted at the base of Tamjout dolomites with grades from 0.34 to 2.71% Cu, 16-175 g/t Ag over thicknesses between 1 and 10m; Tizert West shows a mineralization hosted in greenish sandstones with higher thicknesses; 0.39 to 1.86% Cu, 2 to 37 g/t Ag over thicknesses between 3 and 36m; Tiferki sector: Topographical survey, geological mapping to 1/2 000; drills (546m) in the Nord area. The copper mineralization is hosted in PII quartzites with thicknesses ranging from 1 to 6m and copper grades not exceeding 1%. Tadenst and Talat n'Ouamane sectors: Topographical surveys; Strategic Exploration: launch of a program of soil geochemistry in the Ighrem inlier by 200 X 50m profiles; Sectors covering blocks 2 and 3 (Ouaoufengha and Tanguerfa inliers): topographical surveys.*

## ZONE

Had Imawn

## SUBSTANCES

Au

## PARTNER

MANAGEM

## WORKS

*19 trenches with a total of 1 117m.  
37 core drills totaling 5 800m, with 35 platforms and 1 500m tracks.*

ZONE	Anti Atlas
SUBSTANCES	Precious & Base Metals
PARTNER	NEWMONT
WORKS	<i>Geochemical sampling of 3 505 BLEG samples; Completion of geochemical sampling at 31/12/2012; Covered area: 78 000 km<sup>2</sup>; Highlight of gold, silver and copper anomalies that are being controlled by geological surveys.</i>

ZONE	Tichka Est
SUBSTANCES	Precious & Base Metals
PARTNER	PHAM
WORKS	<ul style="list-style-type: none"> <li>• <i>Compilation of data</i></li> <li>• <i>Realization of geological cross sections</i></li> <li>• <i>Remote sensing survey (Aster and Spot images)</i></li> <li>• <i>Field reconnaissance</i></li> <li>• <i>Geochemical analysis</i></li> <li>• <i>Geological report</i></li> </ul>

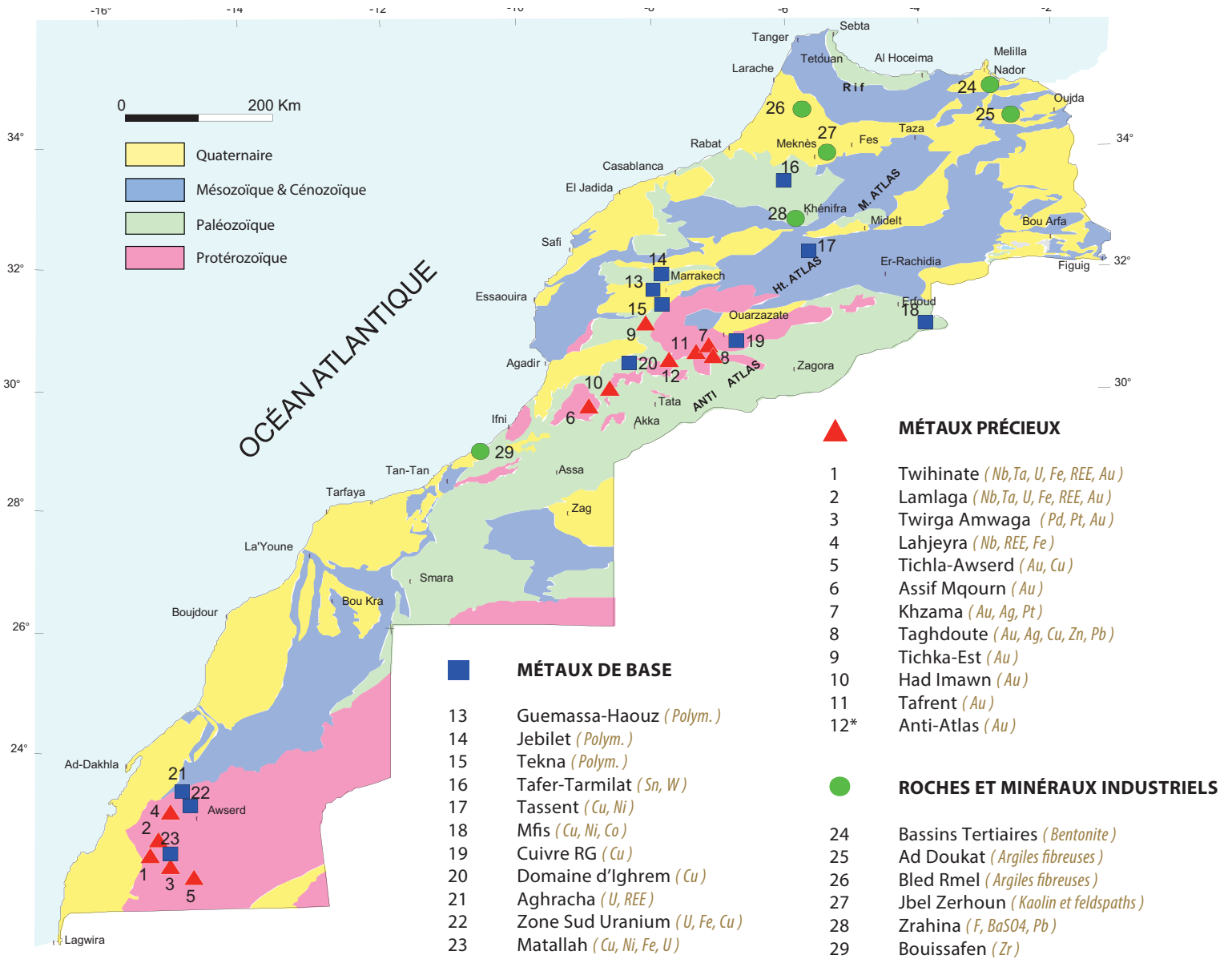
ZONE	Zrahina
SUBSTANCES	F-PB-BA
PARTENAIRES	GARROT CHAILLAC
TRAVAUX	<i>Elaboration of a feasibility study on the basis of updated technical and economic data; Implementation of a pilot project on the site to assess the required firmness of land, validate the choice of the exploitation method and collect a representative ore sample for a processing pilot test; Conducting a feasibility study, a business plan and an executive summary.</i>

ZONE	Tasdremt
SUBSTANCES	Mn
PARTNER	ELEMENT COMMODITIES
WORKS	<i>Positive assessment by Element Commodities of the results of the work done mainly in Tasdremt area under the MOU signed in 2011; Elaboration of a research program whose implementation will start after the approval of the agreement.</i>

ZONE	Tertiary basins
SUBSTANCES	Bentonite
PARTNER	TOLSA
WORKS	<ul style="list-style-type: none"> <li>• <i>General reconnaissance and sampling</i></li> <li>• <i>Identification of bentonite levels</i></li> <li>• <i>Detailed mapping at 1/5 000</i></li> </ul>

ZONE	Bouissafen
SUBSTANCES	Zircon
PARTENAIRES	SANC
TRAVAUX	<ul style="list-style-type: none"> <li>• <i>Mineralurgical study by Guangzhou Research Institute of Non-Ferrous Metals (China)</i></li> <li>• <i>Physico-chemical and mineralogical analyzes.</i></li> <li>• <i>Environnemental impact assessment.</i></li> <li>• <i>Feasibility study by the company NERIN (China).</i></li> </ul>

# Mining Exploration Projects in 2012



\* Ce projet concerne tout l'Anti-Atlas



## MINING LABORATORIES ACTIVITY



The surveillance audit n°1 pointed that the quality management system of the mining laboratories is maintained satisfactorily and that laboratory certification was maintained for the year 2012 according to the standard ISO-9001 Version 2008.

### Mineralogy

- Sample preparation: 143 thin sections, 64 polished blades and 10 polished sections were made and 65 alluvial and artificial concentrates were prepared. For a total of 282 samples.
- Petrographical and mineralogical studies: The studies concerned 232 samples and are divided into 167 petrographical studies and 65 mineralogical studies of alluvial and artificial concentrates. These studies have involved samples from ONHYM own projects and also from third parties.



### Mineral processing

The number of samples prepared for chemical analysis during the year 2012 totaled 17 515 samples distributed as follows:

Worksite	Nombre of samples
ONHYM	12 131
Subsidiaries and third parties	5 384
<b>TOTAL</b>	<b>17 515</b>

*Tests on the flotation unit were made for certain subsidiaries of Managem (SAMINE, CTT, Managem International for Mining).*

### Mineral Chemistry

The total number of determinations made during the year 2012 totaled 164 775, corresponding to 16 597 analyzed samples.

Worksite	Nombre of samples	Nombre of determinations
ONHYM	15 032	155 784
Subsidiaries and third parties	1 565	8 991
<b>TOTAL</b>	<b>16 597</b>	<b>164 775</b>

## MINING DRILLING

During the year 2012, mining drilling teams have operated on 8 sites and conducted 69 drills with a total achievement amount of 3 980.90m against 3 558.20m in 2011, an increase of 11.88%.

# MINING PARTNERSHIPS AND COOPERATION

The year 2012 was marked by signing:

1	Amendment Contract	2	Memorandums of Understanding
3	Protocol Agreement	1	Partnership Agreement
1	Amendment	1	Contract for of a process' recovery development of ore in an acquisition
1	Assignment Agreement		
2	Research Agreements		

## SIGNED AGREEMENTS IN 2012

AREA	SUBSTANCE	PARTNER	TYPE OF AGREEMENT	SUBJECT
<b>Bouissafene</b>	Zircon	SANC	Contract assignment	<i>Deposit Transfer of Bouissafene's Zircon sand to SANC.</i>
<b>Taroudant</b>	Precious Metals & Base Metals	ECLtd	2nd Protocol Agreement	<i>Achievement of works and studies for the mining potential's evaluation taken.</i>
<b>Tiouine</b>	Manganese	GARROT CHAILLAC	Assignment Agreement	Farmout of Tiouine's concessions n° 72 et 73.
<b>Hassiane Ed Diab</b>	Precious Metals & Base Metals	ECLtd	Protocol Agreement Amendment	<i>Extension of Protocol agreements' dispositions strating from 15/11/2011 in mining domain of Hassiane Ed Diab.</i>
<b>South Bani</b>	Iron	TAMARA	Research Agreement	<i>Achievement of works and studies for the exploration and development of the mining domain in South Bani.</i>

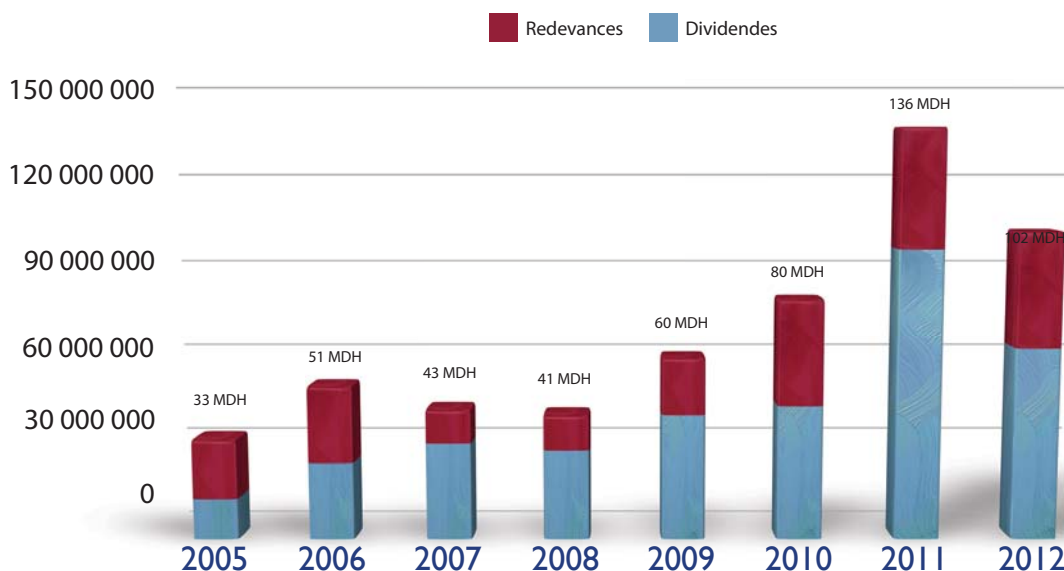
AREA	SUBSTANCE	PARTNER	TYPE OF AGREEMENT	SUBJECT
<b>Zrahina</b>	Fluorite	GARROT CHAILLAC	Memorandum of understanding	<i>Provide a 6 months exclusive option for the GC on the Zrahina's fluorite deposit.</i>
-	-	OMRG	Protocol Agreement	<i>Training and exchanging experiences.</i>
<b>South Akka</b>	Gold	AGM	Contract	<i>Achievement of industrial experiments to implement a development process for the South Akka's ore gold deposits.</i>
<b>East Tichka</b>	Gold	PHAM	Research Agreement	<i>Achievement of works and studies for the exploration and development for East Tichka.</i>
<b>Ben Slimane</b>	Iron	KHADIJA MINING	Protocol Agreement	<i>Achievement of works and preliminary studies campaign in order to evaluate iron grades so as to explore it.</i>
<b>Tafoudait, Tiddas and Tazekka</b>	Precious Metals & Base Metals	TIMCO	Memorandum of understanding	<i>Achievement of works' and studies' campaign in order to evaluate the mining potential of base metals and precious metals for the mining domain covering Tafoudait, Tiddas and Tazekka.</i>
<b>Boumadine</b>	Polymetallic	MAYA	Partnership convention	<i>Assignment of 85% of Boumadine's polymetallic deposit to Maya.</i>
<b>Tasdremt</b>	Manganese	ECLtd	Research Agreement	<i>Achievement of works and studies for the Tasdremt's exploration and development.</i>
<b>Cooperation</b>		OMRG	Amendment	<i>Actions plan 2012-2013.</i>

## ACTIVITY OF THE SUBSIDIARIES

In a favorable international environment, ONHYM's subsidiaries have achieved good results. The decrease is due to the SSM's privatization (32 MDH).

Figures in Dhs

PORTFOLIO INCOME 2005-2012  
(FISCAL YEAR 2011)



# INFORMATION SYSTEMS

After the implementation of the flagship projects of SDSI around the end of the year 2011, the IS activity was mainly oriented to support the users to effectively exploit the IS tools. Several training and assistance sessions were organized internally. In terms of digital data production, the latest projects of data loading, scanning and archiving of the technical documents are in progress such as:

- *The upgrading of documents related to the mining activity*
- *The scanning and the archiving of the hydrocarbon reports*
- *The transcription and the archiving of the geophysical data*
- *The scanning and the archiving of documents related to the subsidiaries and management*
- *The cataloguing through secured access*

As far as the infrastructure is concerned, the projects related to the acquisition of the elements that are necessary to the exploitation of the information system and to the strengthening the IS securities are in progress as follows:

- *Strengthening the safety and the infrastructure*
- *Upgrading the computer network at the Headquarters*
- *Acquisition of the Datacenter platform*
- *Strengthening the IT infrastructure*

## PROJECT MANAGEMENT OFFICE (PMO)

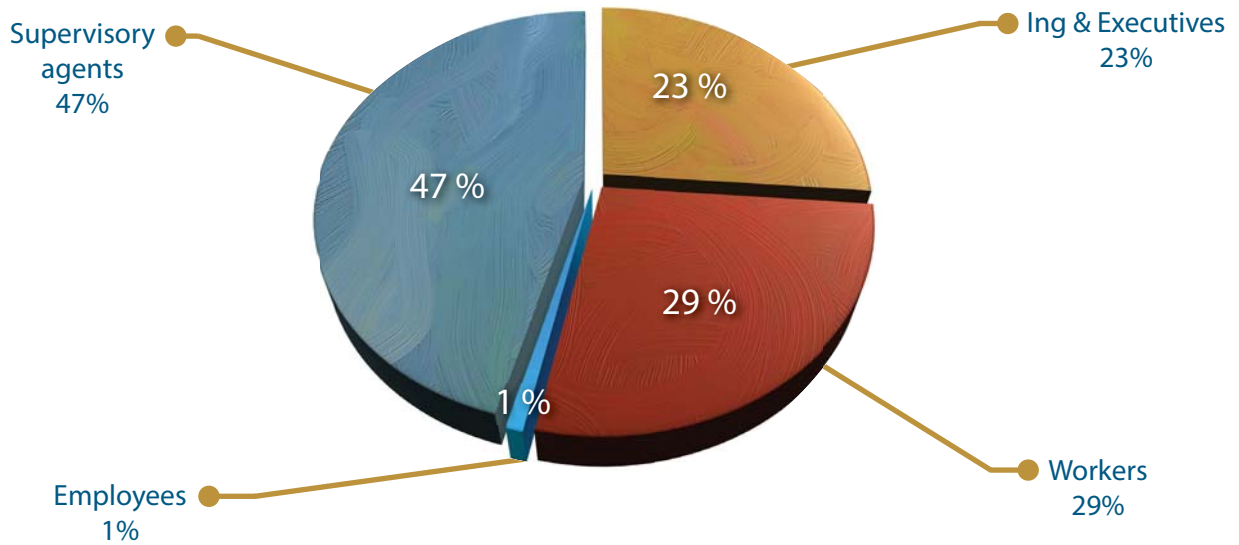
The project management at ONHYM has been strengthened through a series of workshops in order to support the different actors including project managers (about 70) and members of the project management office. These workshops allowed developing an action plan to improve the level of maturity of project management within the ONHYM. In this framework, a monthly dashboard and follow up of the projects was set up.

# HUMAN RESOURCES

## STAFF

The workforce as to December 31-2012 was as follows: 781 employees, including 177 engineers and executives, 364 supervisory agents, 10 employees and 230 workers. The overall workforce of the Office, after a steady decrease from 2001 to 2007 under the combined effect of the retirements and the operations of voluntary departures, has been almost stagnant from 2007 to 2009, and has resumed at a downward trend from 2009 to 2012 due to the mass retirements and very limited recruitment.

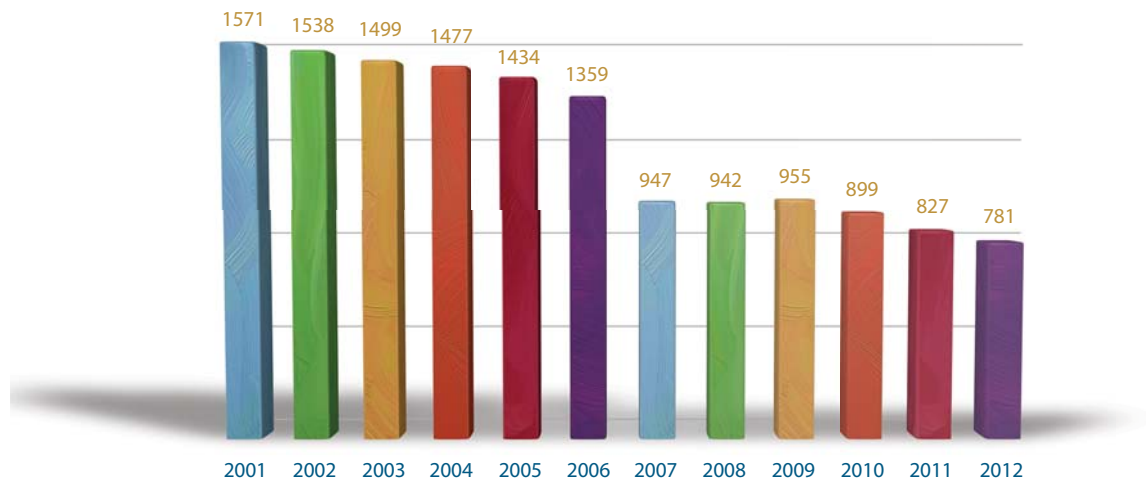
WORKFORCE CATEGORIES



## EVOLUTION OF THE STAFF NUMBER

The overall workforce of the Office, after a steady decrease from 2001 to 2007 under the combined effect of the retirements and the operations of voluntary departures, has been almost stagnant from 2007 to 2009, and has resumed at a downward trend from 2009 to 2012 due to the mass retirements and very limited recruitment.

EVOLUTION OF THE STAFF NUMBER : 2001 - 2012



## SOCIAL ACTIVITIES

- Exceptional salary advances for personal convenience
- Housing loans
- Car loans
- Summering Centers: Cabo-Negro, Ifrane and Kettara
- Vacation camps: 158 have benefited from holiday camp at Ben Smim and Tetouan
- Pilgrimage: 14 officers were supported by the Office to accomplish their pilgrimage



## TRAINING

### Indicators

Number of training actions

### Number

153

Number of participations

707

Number of men-days-training

2 511

Number of beneficiaries

272

# Map of exploration permits and reconnaissance contracts

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المكتب الوطني للهيدروكاربورات و الممادات  
OFFICE NATIONAL DES HYDROCARBURES ET DES MINES



Carte des Permis d'Exploration, des Autorisations de Reconnaissance et des Blocs libres

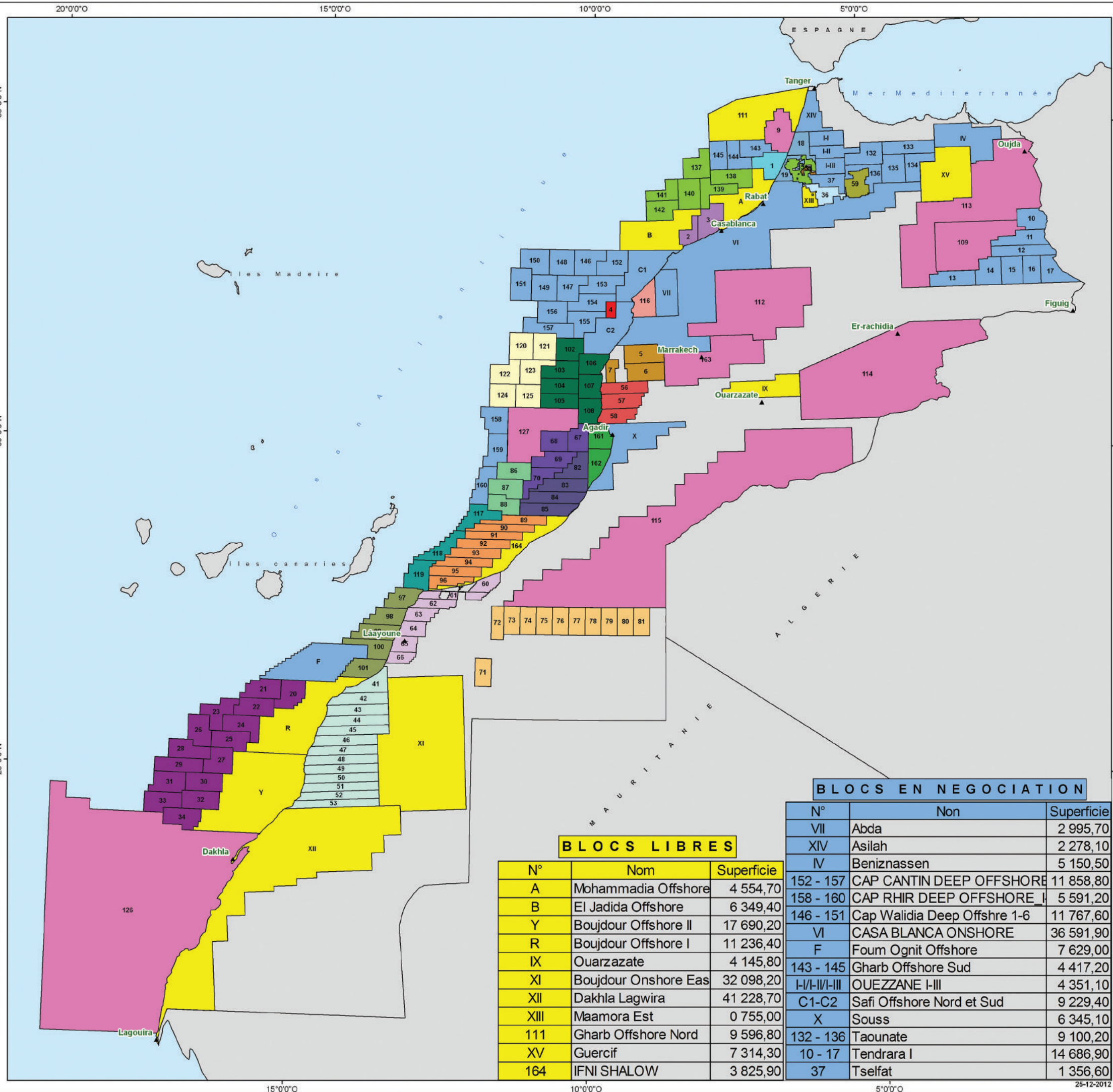


PERMIS DE RECHERCHE

N°	Exploration Zones	Company	superficie km²
1	Loukos offshore I	ONHYM-MPE	1 925,00
2-3	Casablanca offshore A-B	ONHYM-MPE	3 000,00
4	Safi offshore I	ONHYM-MPE	500,00
5	Sidi Mokhtar Nord	ONHYM-MPE-LONGREACH	1 788,40
6	Sidi Mokhtar Sud	ONHYM-MPE-LONGREACH	1 999,00
7	Sidi Mokhtar Ouest	ONHYM-MPE-LONGREACH	713,30
18	Lalla Mimouna Nord	ONHYM-CIRCLE OIL	1 371,20
19	Lalla Mimouna Sud	ONHYM-CIRCLE OIL	840,10
20-34	Cap Boujdour Offshore I-XV	ONHYM-KOSMOS	29 740,70
35	Rharb centre	ONHYM-CABRE	1 358,70
36	Rharb Sud	ONHYM-CABRE	1 357,50
38	Sebou	ONHYM-CIRCLE OIL	134,70
41-53	Boujdour Onshore I-XIII	ONHYM	25 184,90
56-58	Haha 1-3	ONHYM-PEL	4 919,00
59	Fès	ONHYM-CABRE	1 598,85
60-66	Tarfaya onshore 1-7	ONHYM-SAN LEON-LONGREACH	7 730,20
67-70	Foum Assaka Offshore I-IV	ONHYM-KOSMOS-PATHFINDER	6 473,10
71-81	Zag 1-11	ONHYM-SAN LEON-LONGREACH	14 625,30
82-85	Sidi Moussa Offshore 1-4	ONHYM-SERICA-SAN LEON-LONGREACH	7 624,40
86-88	Foum Draa Offshore 1-3	ONHYM-SERICA-SAN LEON-LONGREACH	5 090,00
89-96	Tarfaya Offshore I-VIII	ONHYM-DVM	11 281,90
97-101	Boujdour Offshore Shallow I-IV	ONHYM-TEREDO	9 055,70
102-106	Essaouira Offshore I-VII	ONHYM - KOSMOS - CANAMENS	11 730,80
116	DOUKKALA	ONHYM-EAST WEST	1 997,60
117-119	JUBY MARITIME I-III	ONHYM-NAUTICAL-BARRUS	5 606,40
120-125	MAZAGAN OFFSHORE I-VI	ONHYM-PURA VIDA	10 897,40
137-142	Rabat deep offshore I-VI	ONHYM-CHAROT OIL & GAS INVESTMENTS (MOROCCO) LIMITED	10 781,80
161-162	Mir left offshore I-II	ONHYM - GENEL	3 259,27

AUTORISATIONS DE RECONNAISSANCE

N°	Exploration Zones	Company	superficie Km²
9	Tanger-Larache Offshore	ONHYM-REPSOL - DANA - GAS NATURAL	2 744,00
109	Missour Est 1	ONHYM-MPE	8 873,33
112	Tadla I	ONHYM-EOG	18 845,00
113	Hauts Plateaux	ONHYM-REPSOL	23 356,50
114	Boudenib	ONHYM-REPSOL	33 938,80
115	Assa	ONHYM-ANADARKO	54 808,10
126	Anzarane Offshore	ONHYM-TOTAL	100 926,70
127	Tarhazout Offshore	ONHYM-KOSMOS	7 753,50
163	Haouz	ONHYM-Vermilion Morocco Exploration BV	9 468,90



BLOCS LIBRES

N°	Nom	Superficie
A	Mohammadia Offshore	4 554,70
B	El Jadida Offshore	6 349,40
Y	Boujdour Offshore II	17 690,20
R	Boujdour Offshore I	11 236,40
IX	Ouarzazate	4 145,80
XI	Boujdour Onshore Eas	32 098,20
XII	Dakhla Lagwira	41 228,70
XIII	Maamora Est	0 755,00
111	Gharb Offshore Nord	9 596,80
XV	Guercif	7 314,30
164	IFNI SHALLOW	3 825,90

BLOCS EN NEGOCIATION

N°	Non	Superficie
VII	Abda	2 995,70
XIV	Asilah	2 278,10
IV	Beniznassen	5 150,50
152 - 157	CAP CANTIN DEEP OFFSHORE	11 858,80
158 - 160	CAP RHIR DEEP OFFSHORE	5 591,20
146 - 151	Cap Walidia Deep Offshre 1-6	11 767,60
VI	CASA BLANCA ONSHORE	36 591,90
F	Foum Ognit Offshore	7 629,00
143 - 145	Gharb Offshore Sud	4 417,20
I-II-III-III	OUEZZANE I-III	4 351,10
C1-C2	Safi Offshore Nord et Sud	9 229,40
X	Souss	6 345,10
132 - 136	Taounate	9 100,20
10 - 17	Tendrara I	14 686,90
37	Tselfat	1 356,60



ONHYM

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OFFICE NATIONAL DES HYDROCARBURES ET DES MINES

5, Avenue Moulay Hassan B.P. 99, 1000, Rabat • Morocco  
Tel: +212 (0) 5 37 23 98 98 • Fax: +212 (0) 5 37 70 94 11  
info@onhym.com • www.onhym.com