

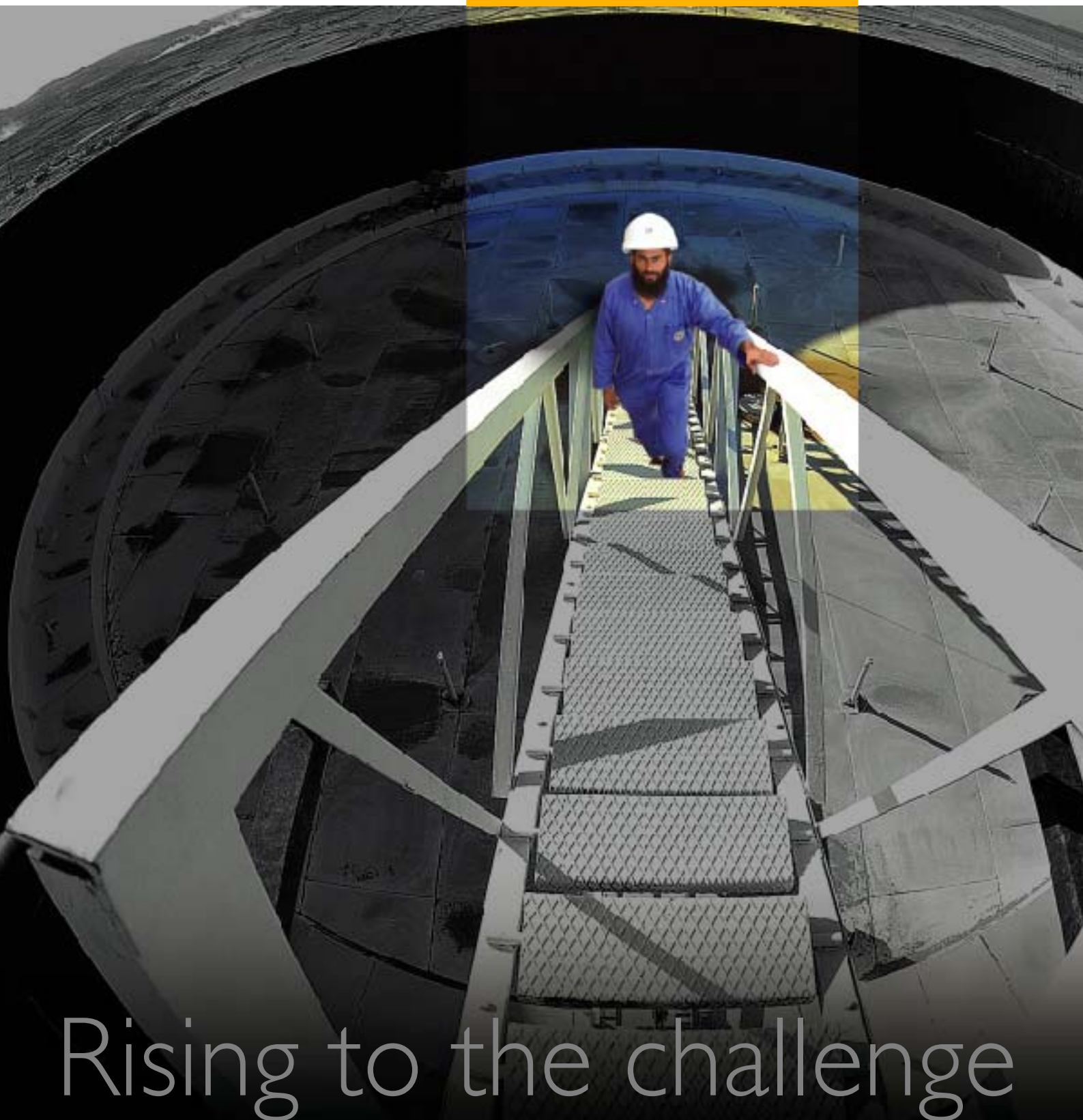


Petroleum Development Oman

2004  
ANNUAL REPORT

to

His Majesty Sultan Qaboos bin Said  
Sultan of Oman



Rising to the challenge

On behalf of Petroleum Development Oman, I have the privilege of reporting to Your Majesty about the Company's contribution to the development of the Sultanate – not only economically, but also environmentally and socially – in the year 2004.

I am glad to report that the Company had an excellent year in all these respects. For the second year in a row, we have met or exceeded our annual oil-production targets. We also managed to meet or exceed all our main environmental-performance targets, which have to do with oil spills and greenhouse-gas emissions. PDO has once again provided an uninterrupted supply of gas to the nation, and it is well on its way to securing the feedstock for the Qalhat Liquefied Natural Gas plant through the construction of the Saih Nihayda gas-processing plant and the laying of the gas-pipeline loop to Al Kamil. Our ambitious plans for beyond the end of this decade were supported by the shareholders' decision to proceed with the Company's first full-scale enhanced oil recovery project, in the Zalzala field of the Harweel cluster.

But the most significant for the longer term is what we achieved in terms of staff development. By the end of 2004, there were 55 more Omanis in the Company than there were at the start of the year, and we spent more than \$3.6 million and devoted more than 10,400 man-days to the training of Omani staff. We also thoroughly reviewed the career plans for the 110 most-promising Omanis in the Company and exceeded another corporate target: the progression of at least 25 Omanis to senior positions. In fact, a total of 77 Omanis were promoted to senior positions in 2004.

We also have been active on the social front. Four social-investment projects got under way in 2004: a veterinary clinic in Thumrait; a laboratory extension to the Shalim Animal Clinic; the National Safe Driver Training Centre; and the re-establishment of the camel-bone carving industry in the Harweel area.

Of course, we realize that there is still much work to be done to secure what Your Majesty began: the sustainability of this nation's development. But, with the support of the Ministry of Oil & Gas and our private shareholders, Your Majesty can be assured that we will contribute in whichever way we can to the realization of your vision for Oman.



**John Malcolm**  
Managing Director



His Majesty  
Sultan Qaboos Bin Said



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The body of this Report is organized according to six principles of sustainable development that the Company seeks to integrate fully into its business processes. The aim is to strike the right balance between successfully delivering oil and gas to the Company's shareholders whilst respecting the welfare of the natural environment and of society.

With effect from 1 January 1980, the Government of Oman has had a 60% shareholding in PDO, which is registered by Royal Decree as a limited liability company in the Sultanate. The remaining interest in the Company is shared amongst the Royal Dutch/Shell Group (34%), Total (4%) and Partex Corporation (2%).

Throughout this report, a billion = 1000 million, and a trillion = 1000 billion.

# Rising to the challenge



Foreword from  
HE the Minister of  
Oil & Gas



**In the name of Allah, the Beneficent, the Merciful...**

I offer once again my earnest assurances of loyalty to Your Majesty, together with my pledge to do my utmost to further your plans for the Sultanate's development, which invariably brings well-being to our nation.

On behalf of all those employed in the oil and gas industry in the Sultanate, I wish to let Your Majesty know of the inspiration we derive from your wise leadership. Since your accession, we have witnessed the flourishing of our economy, the preservation of our natural environment and the cohesion of our society under your reign. And your wisdom shines through those achievements, because they have been accomplished in a way that safeguards them for future generations.

May Allah protect Your Majesty, so that this nation of kind and dedicated people may long continue to prosper under your guidance.

A handwritten signature in black ink, which appears to read 'M. al Rumhy'.

**Mohammed bin Hamad bin Saif al Rumhy**

Minister of Oil & Gas and Chairman of the Board of Directors

# Board of Directors

Representing the Government of Oman



**H E Dr Mohammed bin Hamad bin Saif al Rumhy**  
Minister of Oil & Gas, Chairman



**H E Mohammed bin Nasser al Khasibi**  
Secretary General, Ministry of National Economy  
Deputy Chairman



**H E Nasser bin Khamis al Jashmi**  
Undersecretary, Minister of Oil & Gas



**H E Darwish bin Ismail al Balushi**  
Undersecretary of Financial Affairs  
Ministry of Finance



**Dr. Zaid bin Khamis al Siyabi**  
Director of Oil & Gas Development  
Ministry of Oil & Gas

Representing the Private Shareholders



**Maarten Wetselaar**<sup>1</sup>  
Shell Petroleum Company Limited



**Dr. Andrew Wood**  
Shell Petroleum Company Limited



**Philippe Boisseau**  
Total



**Dr. Antonio Costa Silva**  
Partex Corporation

Executive Officers



**John Malcolm**  
Managing Director



**Dr. Abdulla bin Mohamed al Lamki**  
Deputy Managing Director

Secretary



**Fatma bint Masoud al Kharusi**  
Finance Director

<sup>1</sup>Mr. Wetselaar took up his position on the Board in January 2005



## Managing Director's Review

The year 2004 was another good year for PDO. By exceeding our production and cost-savings targets, we managed – on average – to save half a million dollars every single day of the year while delivering more than 660,000 barrels of crude oil per day and maintaining an uninterrupted supply of natural gas. But perhaps of more significance for the longer term is what we achieved in terms of staff development in 2004. The Deputy Managing Director, Dr Abdullah al Lamki, and I individually met with the most promising 110 Omanis in the Company to thoroughly review their career development plans. In addition, on the basis of their merit and proven competency, 77 Omani staff were promoted to their rightful place amongst senior management. We also managed to meet or exceed all but one of our main health, safety and environmental (HSE) targets.

The one HSE target we regrettably failed to meet in 2004 was the complete avoidance of any operations-related fatalities. I have to report that – despite our best efforts – a 20-year-old man who worked for one of our contractors was tragically killed by a heavy-goods vehicle. Although we were unable to prevent a death in this particular case, we believe that PDO has nonetheless been saving several lives each year through our rigorous HSE management systems and in particular through our road-safety initiatives. Indeed, the success of our road-safety initiatives has led us to work together with the Royal Oman Police to build a National Safe Driver Training Centre, which will be opened in 2005.

Of course, our performance in 2004 must be placed in the much larger context set by our ultimate objectives of returning PDO to production levels of around 800,000 barrels per day, positive annual net reserves additions and total savings of \$2 billion over the period 2004-2008. But even in this larger context there is some good news. The way we monitored and managed our existing wells and reservoirs in 2004 has measurably slowed the production-decline rate of our fields. And the wells that we drilled in 2004 produced more oil than the wells we drilled the year before. We discovered two new oil fields – Malaan and Tibr – and managed to hook them up, together with an extension to the existing Musallim field, quickly enough to garner some 3,300 barrels of oil per day in 2004. We also obtained our shareholders' approval to proceed with the Zalzala enhanced oil recovery (EOR) project. It represents the Company's first full-scale EOR project and it

certainly will not be the last: the field-development plans for several more are being readied for shareholder approval by teams in our Study Centre and EOR directorate.

But to ensure the sustainability of our success at producing oil and gas at an acceptable unit cost, we intend to focus on six major business processes over the coming years. We have to become best in class not only in well and reservoir management but also in operations, in developing our people, in contracting and procurement, in the delivery of wells and projects on-time and on-budget, and in what we call “hydrocarbon maturation”: finding hydrocarbon-bearing reservoirs; appraising their size, structure and properties; accurately simulating the way in which the hydrocarbons flow through them into wells; and then planning – in light of all the data and all the uncertainties – how best to extract the hydrocarbons from them for delivery via pipeline to the coast for export.

The hydrocarbon-maturation process, in particular is paramount for us. It is through this process that volumes of discovered oil are progressed from “oil originally in place” through “scope for recovery” to reserves. And reserves constitute the portfolio of field-development opportunities that is the very future of our business.

For that reason we have redesigned the hydrocarbon-maturation process as well as the other five business processes in 2004, to streamline and standardize them so that accountabilities are clear and informed decisions are made at the right time and at the right leadership level. These revamped processes will be implemented in 2005 with the support of a new organizational structure.

In spite of the good performance we have achieved over the last two years, there is no doubt that we still have many challenges in front of us. The oil and gas business is exceedingly complicated. It involves a lot of people and equipment and it is subject to the vagaries of nature and the global economy. Many surprises lie in wait for us at every turn. But we are fortunate to have a skilled workforce, contractors who are willing to adopt new ways of working, highly committed short-term expatriate staff and – most of all – Omani leaders who are devoted to making their contribution to the nation. I believe that PDO can rise – and meet – the challenges posed by our plans for 2005 and beyond.



## Economic

Generate Profitability  
Benefit Communities





## Generate Profitability

Our business performance is vital to the prosperity of Oman. We thus seek to give the nation a reliable revenue stream by meeting our production targets and by expanding our portfolio of field-development opportunities – all in a way that keeps unit costs down.

### The Year's Highlights

- Average annual production of 661,000 barrels of oil per day in 2004 exceeded the Company's target of 650,000 barrels per day.
- Capital and operational expenditure remained well within approved budgets, which took into account savings of \$150 million relative to the Company's original 2004-2008 programme.
- A new directorate was established specifically to plan and carry out enhanced oil recovery (EOR) projects.
- First oil was produced from the Harweel cluster of fields and approval was given to carry out the Company's first full-scale EOR project there.
- The Company's approach to contracting and procurement was radically changed in close consultation with the Government and the providers of goods and services, with the tendering of a small-fields alliance contract, the adoption of open tendering and the formulation of campaign-drilling and blanket service contracts.
- Six key business processes that underpin the Company's performance were redesigned and a new operating model to support their implementation was conceived.

### Oil & Gas Production

In 2004 the Company produced an average of 661 thousand barrels of oil per day – 11 thousand barrels per day above the target of 650 thousand barrels per day set by the Board of Directors. All customers nominated by the Government also received from PDO a virtually uninterrupted supply of natural gas whose volume amounted to 15.4 billion cubic metres, two-thirds of which went to the Oman Liquefied Natural Gas plant. As a by-product of its gas production and processing, the Company additionally produced a total of 17.3 million barrels of condensate (which is blended with the Company's black

oil) and 76,123 tonnes of liquefied petroleum gas (which is primarily sold to consumers as cooking fuel by bottling companies).

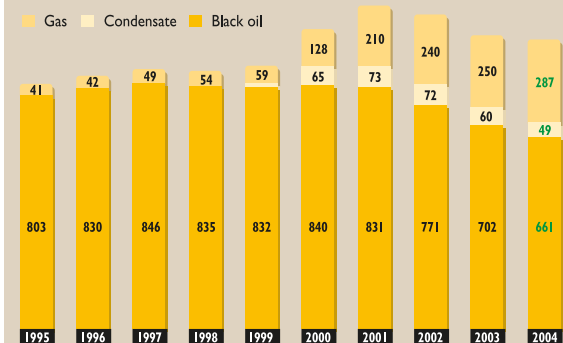
The above-target oil production in 2004 was largely due to two reasons: the amount of oil coming from wells drilled during the year was more than planned and the amount of oil held up because of equipment shut-downs was less than planned. In addition, a concerted programme of well and reservoir management enabled the Company to noticeably lessen the natural decline in the rate of oil production from wells drilled prior to 2004.

### Oilfield Development

Four major waterflooding projects (in which water is injected into a producing formation in order to support reservoir pressure and displace oil toward producing wells) were progressed in 2004. At Fahud several major efforts to collect comprehensive geological and structural data were yielding results. Extensive samples of reservoir rock have been collected from wells, a cross-well electromagnetic induction tool was run to probe the rock properties between pairs of wells [see page 14] and one of the most complex seismic surveys ever conducted by PDO is being carried out. Moreover, pilot-hole wells are being drilled from which preliminary production, injection and pressure data

### Oil, Condensate & Gas Production

thousands of barrels of oil equivalent per day



are being acquired. A pair of field-development plans for the Lekhwair area was approved, underpinning development activities there for the next few years. The waterflood-based field-development plan covering the Ghariff, Haima and Al Khalata reservoirs in the Marmul area is well on track to be completed by the end of 2005. One variant of waterflooding being seriously investigated for this area involves thickening the injected water with polymers so that the sweep efficiency of the flood is markedly improved.

The fourth waterflooding project, involving 23 fields known as the Rahab-Thuleilat-Qaharir (RTQ) cluster, lags behind the Marmul project in its scheduling. But that position will enable what was learned from the Marmul project to be incorporated in the RTQ field-development plan. In any case, rock samples from the reservoirs in the cluster are being analysed and an additional appraisal well will be drilled in 2005 to confirm a significant extension to one of the cluster's fields.

The Company's main three enhanced oil recovery (EOR) field developments – at Harweel, Mukhaizna and Qarn Alam – were also progressed but within a single new directorate that was established at the start of the year. The development of the Harweel cluster of fields had two major highlights to celebrate in 2004: its first oil production and the approval of the Company's first full-scale EOR project. In March 2004, oil produced by conventional means of recovery began flowing from the Zalzala field of the cluster. And in December of that year, when conventional production from Harweel had reached some 15,000 barrels per day with the addition of output

from the nearby Ghafeer, Sakhiya and Dafaq fields, the shareholders approved the Company's first full-scale EOR project, also at Zalzala. The EOR project in question is based on the technique of miscible-gas injection: blending a gas with the oil in the reservoir rock, to form essentially one fluid. The single-fluid nature of the mixture makes it move much more easily through the reservoir and into the producing wells. In essence, the injected gas acts as an oil solvent that "cleans" the reservoir of its oil.

The Harweel team was also buoyed by the results of trials with air drilling (which eschews the usual "mud" that circulates in a well while it is being drilled). Air drilling showed much higher rates of penetration through the hard rock in that area, raising an opportunity to complete wells quicker and therefore cheaper than originally thought.

The Mukhaizna EOR project moved ahead in 2004 with the tendering of a front-end engineering and design contract. Additionally, a pilot project was kicked off to produce steam at the surface and inject it into the reservoir in 2005. The data from the pilot should confirm the assumptions underlying the preliminary field-development plan, which, in its initial stages, is based on injecting steam into a well, allowing it to heat the region around the wellbore, and then to use the same well to produce the oil that has been thinned by the heat. Later, the steam will be injected into the reservoir so that it sweeps the oil toward producing wells in what is termed a steam flood.

Briefing for crew of Fahud 3D seismic survey





Unlike the Mukhaizna EOR project, the Qarn Alam EOR project will take advantage of the reservoir's extensive fractures as a means both for spreading heat (in the form of steam) throughout the reservoir and for channeling the flow of oil that has been made more mobile by the heat. The production data from a steam-injection pilot project currently in operation at Qarn Alam steam supports the feasibility of this process, which is known as thermally assisted gas/oil gravity drainage. But the unprecedented construction of a fully-integrated computerized reservoir model in 2004 has provided a substantially better understanding of the subsurface uncertainties surrounding the process. Further studies will be conducted for the project with the view of reaching a final investment decision early in 2006.

### Gasfield Development

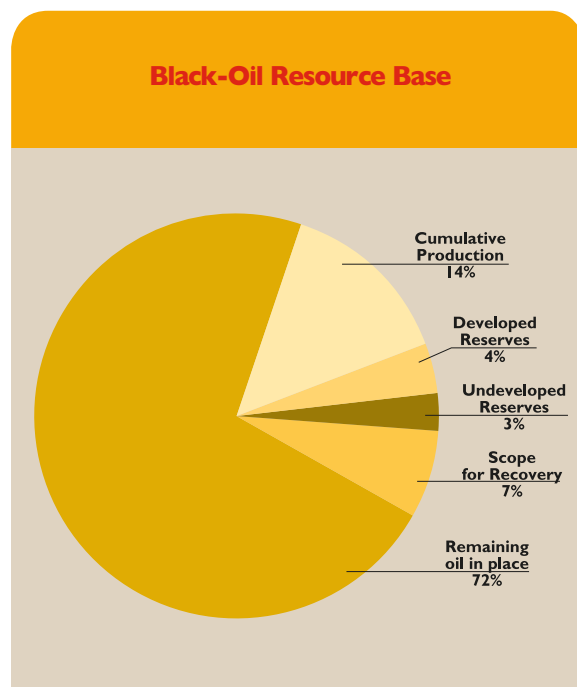
The central Oman expansion projects – the construction of the Saih Nihayda Gas Plant (SNGP) and the laying of a 48-inch loop pipeline from the SNGP to the vicinity of Al Kamil – fell slightly behind plan in 2004. The Kauther Gas Plant engineering and procurement contract was tendered and the front-end design of the associated pipeline system was nearly completed. Several compression projects – for central Oman, Barik and Yibal – are also being readied for completion in the next few years, when the pressure in the reservoirs no longer can adequately drive the gas to the surface.

The studies underlying the field-development plans for the major gas fields of Saih Rawl, Saih Rawl South, Barik and Kauther progressed according to schedule. So too did their drill sequence. Six heavy drilling rigs managed to speed up their operations so that 28 gas wells were completed by the end of 2004 – 16 in Saih Rawl, nine in Saih Nihayda, one in Barik and two in Kauther. All but one of the new wells was hydraulically fractured to stimulate the production of gas.

A Gas Business Plan for 2005 and beyond was submitted to the Government, which approved it. This plan, unlike any previous one, was fully supply driven: that is, it was formulated on the basis of optimum reservoir off-take rates as determined from computer models, prudent reservoir management principles and balanced risk-taking in relation to new field developments.

### Oil & Gas Reserves

Following a major review of its resource base, the Company reformulated in 2004 the process by which it



finds hydrocarbon-bearing reservoirs, appraises their size, structure and properties, accurately simulates the way in which the hydrocarbons flow through them into wells and then plans – in light of all the data and all the uncertainties – how best to extract the hydrocarbons from them for delivery via pipeline to the coast for export by the Company's shareholders. It is through this “hydrocarbon-maturation process” that volumes of discovered oil are progressively classified from “oil originally in place” through “scope for recovery” to undeveloped reserves before reaching the final category of developed reserves.

In 2004, the Company's developed reserves (those volumes of oil that have been made accessible by existing wells and production facilities) increased on the basis of the comprehensive studies underlying the Company's field-development plans. In particular, the field-development plans for Lekhwair and Nimr yielded increases in reserves that more than offset the decreases in the reserves of Yibal, Al Noor, Fahud, Marmul, Natih and Saih Nihayda.

The Company also found some oil and gas through its exploration efforts. Exploration wells revealed 48.6 million barrels of “new oil” at Malaan, Tibr and Ghafeer that have been categorized as scope for recovery. Exploration wells drilled near existing fields also revealed an additional 66.4 million barrels of scope-for-recovery “old oil” at Musallim, Burhaan North West and Maurid. By having them hooked up quickly to the oil-production facilities, the Company managed to produce an average of 3,300 barrels per day from its successful exploration wells at Musallim, Malaan and Tibr.

No gas reserves were booked in 2004, although the field-development plans for the Company's major gas fields will no doubt result in bookings, which will be factored into the Company's reserves at the end of 2005. That is not to say that no gas was discovered in 2004. Exploration wells did discover 0.53 trillion cubic feet of gas that have been categorized as scope for recovery.

Condensate reserve bookings in 2004 amounted to 17.2 million barrels, on the basis of wells drilled at Budour and Al Huwaisah.

### Expenditure & Cost-efficiency

Total expenditure in 2004 was \$1,638 million, consisting of \$498 million operating expenditure and \$1,140 million capital expenditure (including exploration expenses). The 2004 budget, originally approved by the Board of Directors in October 2003 and adjusted a year later, allowed for about 5% more operating expenditure and about 7% more capital expenditure. Compared with the actual Company expenditure of 2003, that of 2004 represents an increase of 1.5% (amounting to \$17 million) in capital expenditure but a decrease of 1% (amounting to \$5 million) in operating expenditure. Unit expenditure in 2004 was \$6.79 per barrel, representing an increase of 7% from 2003.

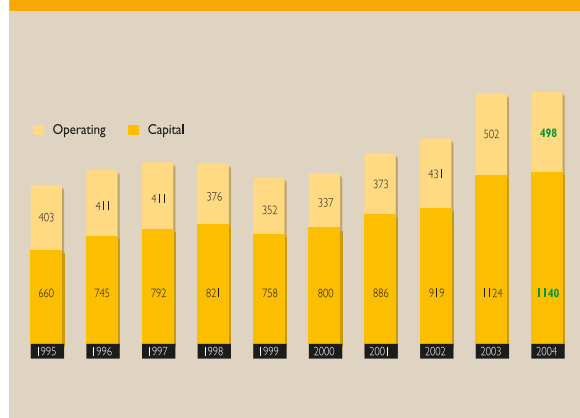
The budget for 2004 took into account a cost-saving target of \$150 million relative to the 2004-2008 programme originally proposed by the Company in October 2003. In spite of the tight market conditions, those savings – and more – were achieved. The savings beyond the \$150-million target arose mostly from the Company's further cost-saving initiatives but approximately \$70 million arose from the re-phasing of capital expenditure for certain projects.

The Company's business performance in 2004 – the exceeding of its production targets within its given budget –

Signing of the Company's new 40-year concession and shareholder agreements



### Expenditure millions of dollars



is in large part due to its sweeping change programme, known as the Operating Model Review (OMR). But 2004 represents only the start of the cost-efficiency improvements envisaged by the OMR. To meet far more ambitious savings and production targets over the next few years, the Company has concentrated intently on six key priorities:

- well and reservoir management;
- operational excellence;
- people;
- hydrocarbon maturation;
- drilling and engineering projects; and
- contracting and procurement.

Contracting and procurement in particular has seen much progress in 2004 under the OMR, thanks to the co-operation of the Government and the providers of the goods and services in question. One example is the tendering of a small-fields alliance contract by which the development of fields that are too small and too remote to merit the Company's undivided attention will be managed by a third party under the terms of a service agreement. Other examples are the worldwide open tendering that the Company has adopted for all contracts worth more than half a million dollars and the tendering of blanket contracts for area-specific drilling campaigns as well as company-wide oilfield services.

OMR teams have been busy redesigning and standardising the six priority processes, to ensure that accountabilities are clear, that the work is carried out without overlaps or duplication, and that the information needed to make decisions is available and understood. To support these revamped processes, the OMR teams have also put together a new organisational structure, which was approved by the Board of Directors for implementation in 2005.



## Benefit Communities

Because our work affects local communities, we constantly look for appropriate ways to contribute to their general well-being by offering direct and indirect employment, spending money for local products and services, and making voluntary investments in social programmes.

### The Year's Highlights

- Contracts worth more than \$40 million were awarded to local community contractors (LCCs) in 2004, bringing the cumulative value of all LCC contracts to more than \$200 million.
- The Company has committed itself to build, in conjunction with the Royal Oman Police, a National Road Safety Centre – the first of its kind in the country – to train people in defensive driving techniques.
- Six social projects that arose from integrated impact assessments were progressed, three in connection with the Harweel field development and three in connection with the expansion of gas-pipeline capacity.
- The Company also approved several social-investment projects that are unrelated to specific field-development or engineering projects.

### Business Development

The total contract value awarded to local community contractors (LCCs) in 2004 was \$41 million – an increase of 9% from the previous year. Since 1998, when the scheme was instituted, LCCs have been awarded contracts with a cumulative total of more than \$200 million.

But stimulating business is not just a matter of paying LCCs for the work they have done for PDO. To become sustainable companies, LCCs have to obtain the skills necessary to grow and expand their business. To that end, PDO is continuing with its LCC Coaching Scheme, which helps LCC owners to improve the way they manage issues pertaining to Health, Safety and Environment (HSE) and to enhance their commercial skills.

To assess the success of the LCC programme to date, independent experts were called in by PDO in April 2004. Some of their recommendations will be incorporated in a

strategy that the Company is developing for the programme's way forward.

### Social Performance

PDO strongly demonstrated its contribution to society in 2004 through the financial support provided by its Grants and Donations Committee and through the implementation of new social projects. The Company donated about \$126,000 in response to 104 of 427 official requests for support of various educational, sporting and health-related events as well as of various conferences and exhibitions. It also donated 1255 surplus PCs to various organizations and schools throughout the country, according to an agreement it reached with the Ministry of Education and the Government's Social Investment Committee.

One area that received particular attention in 2004 was road safety. PDO has for many years been implementing various means to minimize the road traffic accidents associated with its operations [see page 16], but in 2004 the Company decided to offer its long experience in promoting driver safety to the public in a grand way. It agreed to build a National Road Safety Centre – the first of its kind in the country. The centre, which is being planned and constructed in conjunction with the Royal Oman Police, will take advantage of modern lecture halls, computerized simulators, learner vehicles and test grounds to train people in defensive driving techniques. It will be officially opened in 2005 as a "Gift to the Nation".



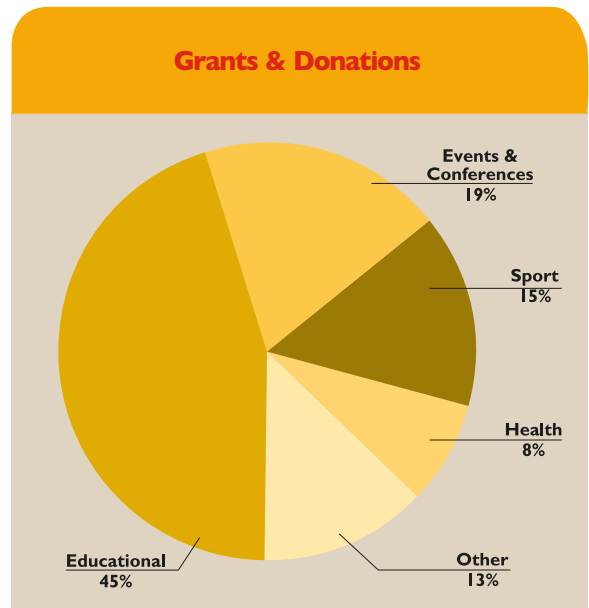
The Company also funded the preparation of an interactive multimedia CD about the marine wildlife of Oman. The CD will be distributed to all schools in Oman, so that children can learn about the natural environment of the nation's coastal waters.

As part of Harweel field-development project in south Oman [see page 5], the Company embarked in 2004 on three social projects that were endorsed in 2003 by the Government's Social Investment Committee:

- the establishment of a veterinary clinic in Thumrait;
- the establishment of training programmes for artisans and of the markets for raw and finished camel-bone products; and
- the addition of a laboratory to the Shelim veterinary clinic.

The Thumrait veterinary clinic is expected to open in 2005, with a handover to the Ministry of Agriculture and Fisheries (MAF) in 2006. As a result of the Company's support of the special training of four women at Dahaboon and of the marketing of their wares, camel-bone products are now available at duty-free shops in regional airports and local art and craft boutiques. Some of the camel-bone products will be sent to the Smithsonian Museum in Washington, D.C., as an exhibit of folk craft in 2005. Construction of the laboratory extension to the Shelim veterinary clinic will begin in April 2005, according to a design approved by the MAF.

A fourth social project originally endorsed by the Social Investment Committee – the establishment of



livestock markets at Thumrait and Shelim – was dropped at the recommendation of the MAF and the local *walis*.

The Company has also approved six social projects in 2004, three that were proposed in connection with the gas pipeline capacity-increase project and three that were proposed without connection to any particular field-development or engineering project [see page 18].

These and other such projects to directly assist the Omani men and women living in PDO's area of operations complement the Company's equally important social contributions that flow indirectly from its programmes for educational support [see page 17], local business development [see page 8] and the provision of road, electricity and water infrastructure.

**Official opening of the Fahud airport – the first in the interior of the Sultanate to have an asphalted, illuminated runway**





## Environment

Protect the Environment  
Manage Resources Efficiently





## Protect the Environment

The natural environment supports all human activity. We continually look for better ways to reduce the toll our operations impose on the air, water and land of Oman.

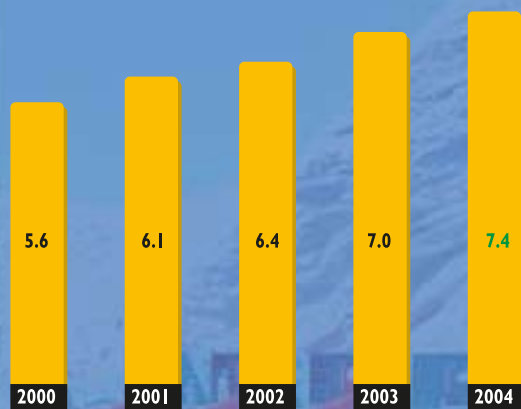
### The Year's Highlights

- Permits from the Ministry of Regional Municipalities, Environment and Water Resources have been obtained for all of the Company's existing facilities and all of its new projects.
- An independent audit once again confirmed that the Company's environmental management system complied with the ISO 14001 standards.

- The global warming potential of the Company's gaseous emissions was well within the target for the year.
- Far less oil was spilled in 2004 than in 2003.
- A comprehensive inventory of the Company's abandoned assets at 150 sites was carried out.
- The volume of water needed for the Company's utilities and services did not change significantly from what it was in 2003.



### Global Warming Potential million tonnes CO<sub>2</sub> equivalent





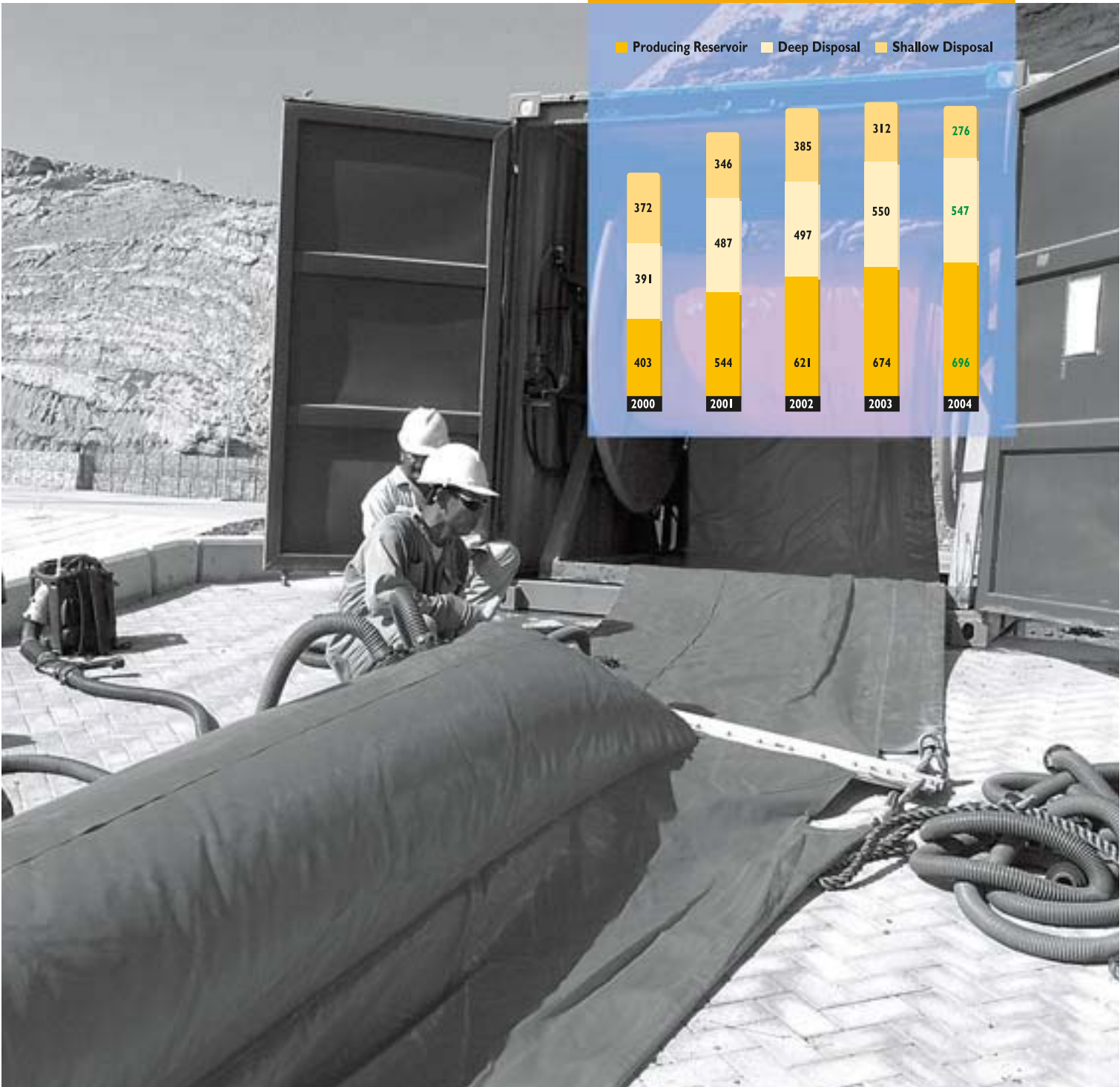
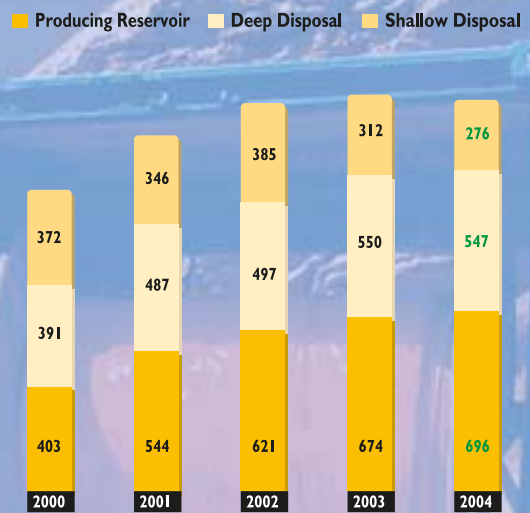
## Air

Gaseous emissions to the atmosphere continue to be an area of focus for the Company. In 2004, the Company's operations resulted in the emission of gases with a global warming potential equivalent to 7.27 million tonnes of carbon dioxide. This total was well within the Company's target for the year.

A new strategy to manage flaring of gas was introduced by the Company. The strategy strikes a balance between the environmental impact of flaring on the one side and the economic impact of deferring

oil production due to the avoidance of flaring on the other. In any event, the company managed to flare less gas in 2004 (a total of 0.946 tonnes) than it had allowed for in its plans (a total of 0.975 tonnes).

### Produced-water Disposal millions of barrels



## Water

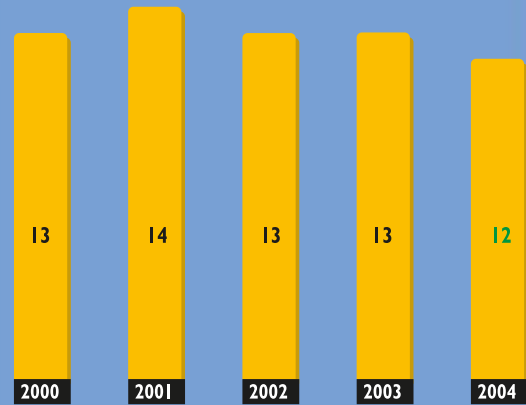
Because of their maturity, the Company's major fields continue to produce vast amounts of water along with their crude oil. For every barrel of oil that PDO produced in 2004, it produced nearly seven barrels of "produced water". By striving for best-practice management not only of its wells and reservoirs but also of its produced water, the Company has succeeded in slowing down the rate at which the produced-water volume is growing. Almost half the amount of produced water is now used for waterflooding [see pages 4 - 5]. The remainder is mostly injected into deep or non-exploitable aquifers, although some of it is disposed of in shallow aquifers. Most of the Company's shallow water disposal will be phased out with the completion of deep water disposal projects in Nimr, Rima and Suwaihah in 2005. The Company, however, has requested the Ministry of Regional Municipalities, Environment and Water Resources

to permit the shallow disposal of produced water in Sayyala and Sadad, since the environmental impact of the continued disposal in those areas is very small. The request is backed-up by detailed monitoring and computer modeling of the plume of disposed water.

The total volume of water needed for drilling wells, irrigation, drinking and washing electrical overhead lines did not change significantly from what it was in 2003; nearly all of it was supplied from shallow aquifers. In future, however, substantial amounts of boiler feedwater will be required for steam projects [see pages 5 - 6].

### Oil Concentration in Effluent Discharged to the Sea

grams per cubic metre





## Land

In 2004 a total of 299 tonnes of oil was spilled – far less than in 2003, when two large oil spills of more than 120 tonnes each, occurred.

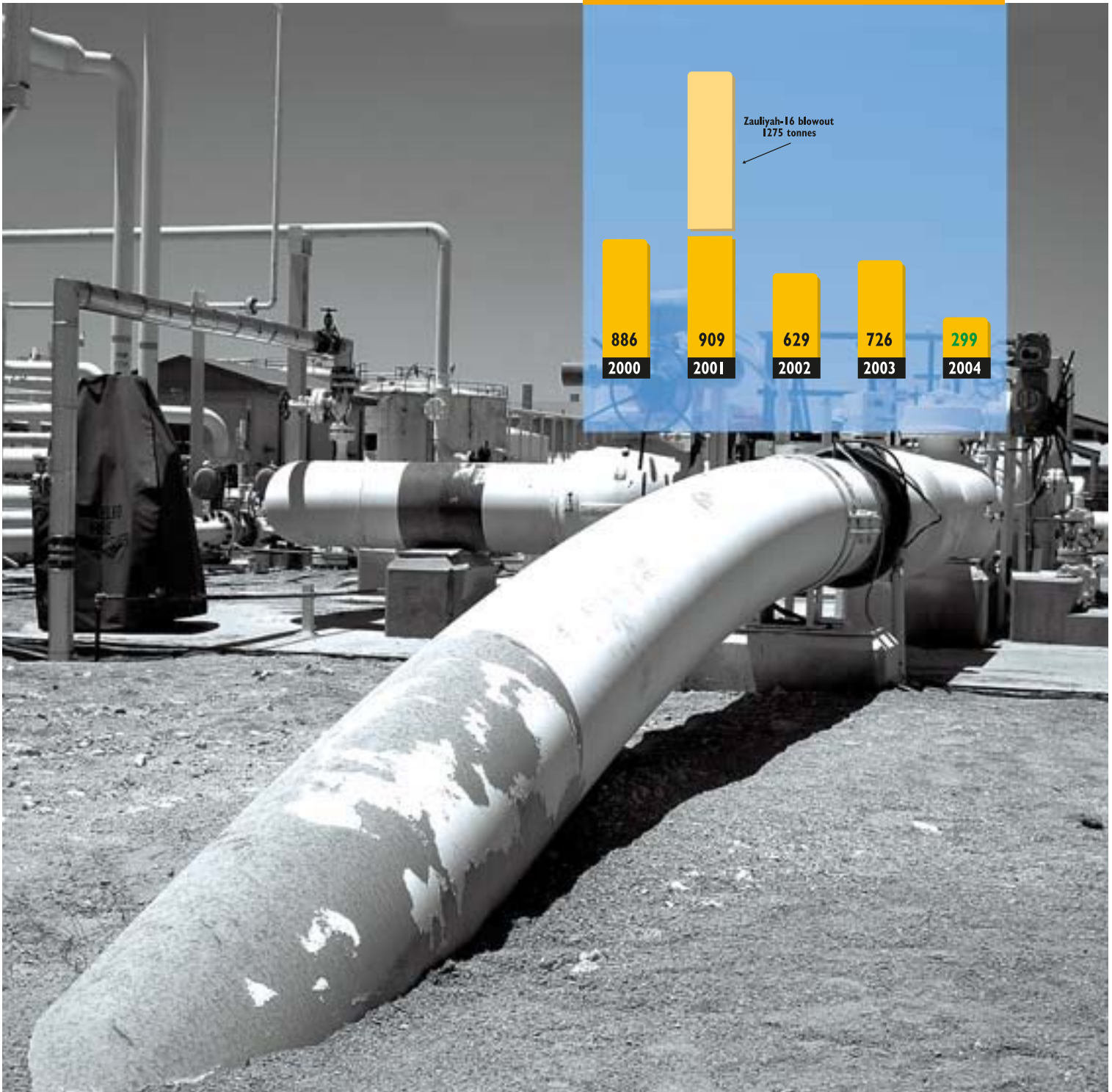
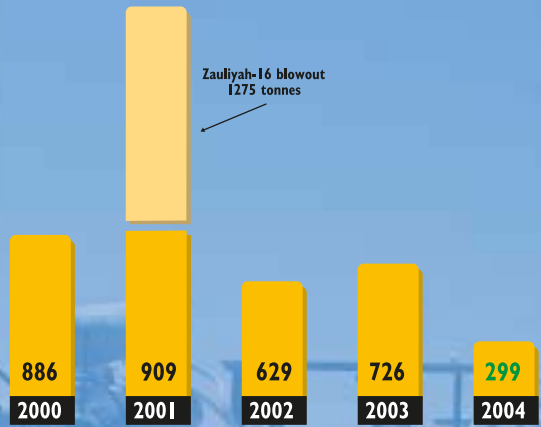
Phase 2 of the clean-up of the Zauliyah-16 well site, where a blowout occurred in 2001, was tendered in 2004 for implementation in 2005.

As part of its normal course of operations, the Company abandons and writes off assets such as wells, airstrips, waste sites, temporary camps etc. A comprehensive inventory of the Company's abandoned assets was compiled in 2004. All in all, 150 sites were assessed. Many of the abandoned sites were restored as

per the Company guidelines if not already so; a plan is being prepared to restore the remaining sites.

Also, in 2004, the Company revised its guidelines for the conduct of activities in the controlled zones of the Arabian Oryx Sanctuary, a UNESCO World Heritage Site. In one of the first workshops of its kind, supervisory staff were made aware of the delicate ecological balance maintained in the desert environment.

**Volume of Oil Spilled**  
tonnes



## Manage Resources Efficiently

Efficient use of natural resources reduces our costs and respects the needs of future generations. We are constantly looking for ways to make our operations more cost efficient, in large part by prudently applying new technology. We also minimise the amount of ground water and the amount of energy our operations require.

### The Year's Highlights

- The implementation of new technology has been re-focused on to a few areas, such as the shutting off of water flow into wells and the detection of by-passed oil in a reservoir, in which an effective solution would be of particularly high value to the Company.
- The scaling up of the Nimr reed-bed water-treatment facility has been determined to be technically, financially and socially feasible by an independent consultancy.
- By taking advantage of the waste heat of power stations, the Company has been able to scale back the gas consumption of the steam-based projects at Mukhaizna and Qarn Alam.

### Technology

The Company re-focused its new-technology implementation efforts so as to concentrate on fewer technologies of particularly high value to the Company. Given the maturity of the Company's major fields, such technologies would include those intended to locate by-passed pockets of oil in reservoirs as well as those intended to reduce the production of water from oil wells. An example of the former is provided by cross-well electromagnetic imaging (EMI) and an example of the latter is provided by the expandable zonal inflow profiler (EZIP).

Cross-well EMI can provide a cross-sectional image of what lies between two wells. It is being applied at Fahud in support of the waterflooding project there. Predicting how water will flow from an injection to a producing well is often frustrated by the many fractures and rock heterogeneities that characterize a Fahud reservoir. Cross-well EMI provides a way to monitor the progress of the water front.

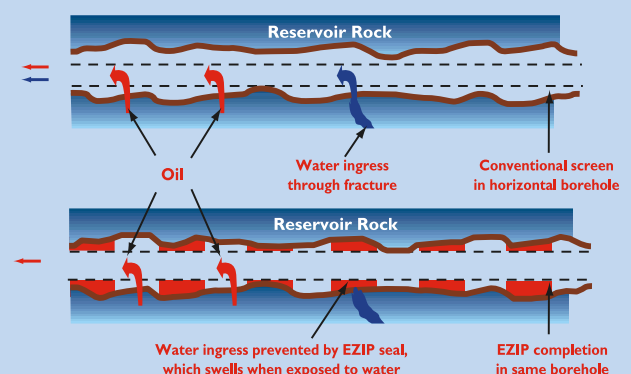
The EZIP is a type of well completion that, when placed in contact with water inside a borehole, swells to provide a strong seal that prevents the water from entering the well. A total of 44 wells have been completed with EZIPs and by the end of 2004 they had contributed an additional 400,000 barrels of oil. Plans are in place for a massive deployment of this technology in 2005.

### Water

Ground water is a precious resource in an arid country such as Oman. For that reason the Company puts an explicit value, which ranges from 10 to 20 cents per cubic metre, on the preservation of ground water as part of its planning, including that done for its waterflood and steam-injection projects [see pages 4 - 6]. But even taking the value of ground water into account, the Company came to the conclusion in 2004 that the copious amounts of water produced from the Nimr field could be economically supplied by pipeline as boiler feedwater only as far as Mukhaizna and not on to Qarn Alam, which lies further away from Nimr.

In any case, the Company has continued investigating ways of treating Nimr production water sufficiently so that it can be used locally for some end. In fact, beds of reeds have been cultivated at Nimr for more than three years now, as a means of cleaning produced water. The produced water flows in at one end of the bed, and by the time the water has reached the opposite end of the bed, most oil has been removed by the biological action of the plants'

Working principle of EZIP completion:  
water is blocked out but oil is let in





roots. The treated water has then been used to irrigate a plot of salt-tolerant trees, which could perhaps yield a saleable product. An independent study of the scaling-up of this reed bed/forest combination concluded in 2004 that it was technically, financially and socially feasible.

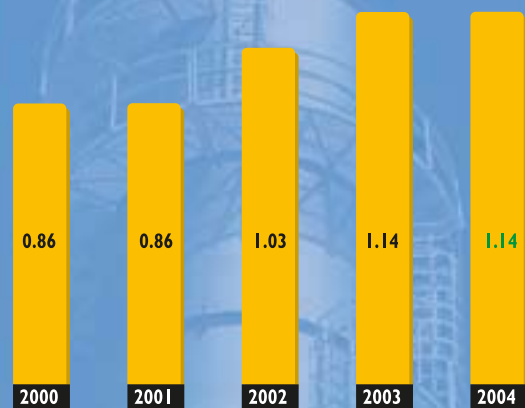
### Heat

The teams working on the Mukhaizna and Qarn Alam steam-based enhanced oil recovery (EOR) projects [see pages 5 - 6] and the Company's power systems have noted that the overall gas requirements for converting water into steam could be substantially reduced by taking

advantage of the heat of the exhaust gases from PDO's power stations. Accordingly, the relocation of future power stations from Nimr to Mukhaizna and from Yibal to Qarn Alam have been integrated into both the infrastructure and EOR plans of the Company.

### Energy Efficiency

megajoules per tonne of oil equivalent produced



## SOCIAL

Respect and Safeguard People

Work with Stakeholders







## Respect and Safeguard People

We strive to respect individuals and protect people from harm by making safety our number one priority and by carefully monitoring occupational illnesses amongst staff and contractors. We also try to help Omani staff realise their potential by laying out well-defined career paths for them.

### The Year's Highlights

- The frequency of lost-time incidents in 2004 – at 0.54 incidents per million man-hours – was nearly 18% lower than in 2003.
- From 2003 to 2004, the average number of traffic accidents associated with the Company's operations fell from 0.59 to 0.56 accidents per million kilometres driven.
- The total number of Omanis in the Company rose to 3703 at the end of 2004, while the expatriate population fell to 884.

### Safety

The Company regrets to report that a contractor employee was killed by a heavy-goods vehicle in 2004. In spite of this tragedy, the number of traffic accidents per million kilometers driven in connection the Company's operations continued its downward trend, from 0.59 in 2003 to 0.56 in 2004. This excellent road-safety performance was due to a combination of compulsory defensive-driving courses, road-worthiness monitoring and a concerted communications campaign to instill greater

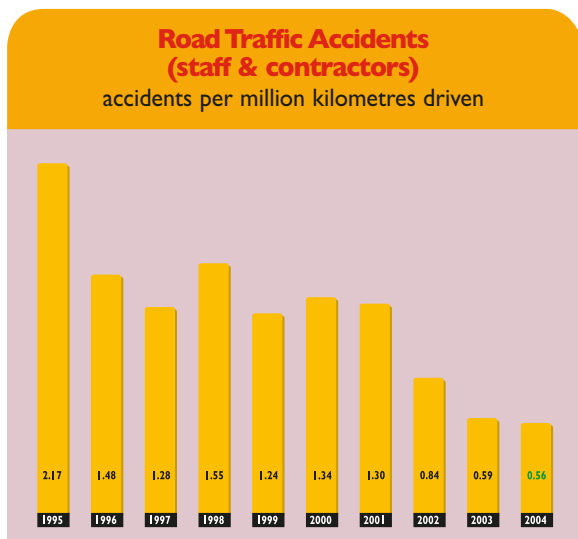
staff awareness of the hazards inherent in motor transport. In fact, PDO has for many years been an ardent advocate of road safety, and in 2004 it decided to share its expertise as a "Gift to the Nation" in the form of a National Road Safety Centre [see page 8].

Overall, the frequency of lost-time incidents in the Company in 2004 – at 0.54 incidents per million man-hours – was lower than in 2003 and met the ambitious target that the Company had set for itself. Finger injuries continue to account for a large proportion of the incidents that result in lost work time.

### Health

The Company continues to be committed to providing comprehensive primary healthcare for all employees and their dependants and to responding quickly and effectively in the event of a medical emergency in all areas of its operations

The Company's total recordable occupational illness frequency improved in going from 2003 to 2004, from 4.3 to 3.4 cases of occupational illness per million man-hours worked. In 2004, the emphasis of its occupational-health programme was on fitness-to-work standards and risk-based medical examinations, both of which are now well established. In addition, a variety of "road shows" were conducted to educate staff and contractors about stress management and lifestyle health risks.



### Agreement with Royal Oman Police for a "Gift to the Nation" from PDO: the National Safe Driver Training Centre



## Competence Development

To streamline its recruitment process, the Company introduced in 2004 an online web-based system through which it advertised jobs and through which people applied for them. The system, which has been integrated into PDO's internet website at [www.pdo.co.om](http://www.pdo.co.om), allows members of the public to search for jobs, compare their experience and qualifications against selection criteria and apply for positions. In addition, people can register their interest in positions that do not yet exist, in the expectation that they will be automatically contacted if something suitable arises in the future. The system also tracks the processing of applications, automatically sending out e-mail notices to applicants.

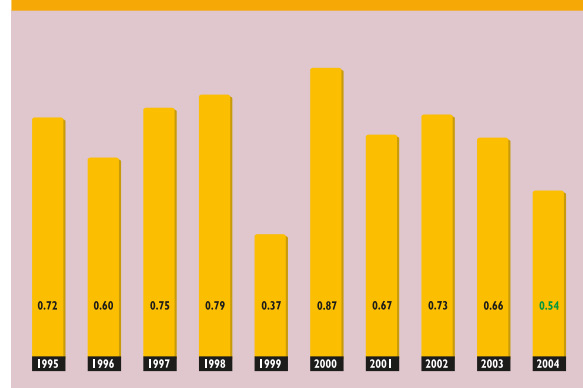
Thanks in part to the Company's strengthened recruitment drive, the total number of Omanis in the Company increased from 3648 at the end of 2003 to 3703 at the end of 2004. At the same time, the Company's expatriate population was reduced to 884.

In 2004 the Managing Director and Deputy Managing Director of the Company personally reviewed the career plans for the 110 most-promising Omanis in the company, 77 of them earning promotions that same year.

PDO continued to support Omani youth at virtually all levels of education in 2004. It paid for the education of 14 primary-school and 45 secondary-school pupils at the Sultan School, as well as of some 130 full-time undergraduate and post-graduate students at universities abroad. It also supported 13 full-time students attending

## Occupational Accidents

lost-time injuries per million man-hours



engineering diploma and degree courses at the local Caledonian College.

The Company also has been providing training of its own through its Training for Omanisation Programme (TOP), which develops maintenance technicians and production operators for the Company through an apprenticeship scheme. A total of 86 graduates from technical colleges participated in the TOP in 2004. Another batch of 50 or so trainees is expected in 2005. All in all, the Company devoted a total of 10,414 man-days and \$3.7 million in 2004 to develop its people by means of training courses and workshops.

The Company also supports other training and educational programmes to equip young Omanis with the knowledge needed for gainful employment, not necessarily with the Company. The Company's Vocational Technical Training Programme at the Fahud Learning and Development Centre is one example. Ninety trainees were enrolled in the programme in 2004.

## Omanisation

number of Omani staff



## Young Omanis in the Company's Vocational Technical Training Programme at the Fahud Learning and Development Centre







## Work with Stakeholders

We affect – and are affected by – many different groups of people. We aim to recognise the legitimacy of their interest in our business and to identify the social consequences of what we do and – if necessary – respond to them.

### The Year's Highlights

- As part of the capacity-expansion project for the Saih Rawl-to-Qalhat gas pipeline, the Company has arranged for various economic and social benefits to be spread amongst the local communities along the pipeline route.

### Gas Loop Line

On behalf of the Ministry of Oil & Gas, the Company has undertaken a project to expand the transport capacity of the existing 48-inch gas pipeline from its Central Processing Plant at Saih Rawl to Qalhat by laying a 48-inch “loop line” alongside it [see page 6]. To ensure that the communities living along the route of the parallel pipelines are not unduly disadvantaged, an integrated impact assessment (IIA) was conducted.

An IIA is intended to ensure that the Company addresses not only the environmental aspects but also the social and health aspects of its operations and to ensure the cost-effectiveness of whatever measures it takes to mitigate the negative consequences of its operations. The IIA process follows a sequence of many steps, starting at the early stage of project definition so that findings may be fed back into the design process to minimise impacts and maximise benefits. Consultation with stakeholders at all levels is required throughout the process.

As a consequence of the IIA, the Company took several measures in 2004 to spread some social benefits from the project amongst the local communities living along the pipeline route. For one thing, approximately 40% of the Omani workforce on the project comes from the local communities. And the workforce includes not only men who perform the clearing, trenching and burying tasks but also women who patrol the trenches to ward off stray livestock.

Moreover, six contracts, the total value of which amounts to RO 256,550 have been awarded to companies based in the area.

### Social Projects

The Company has also followed its procedures for ranking the various social projects that were identified as part of its community-engagement efforts; six projects were selected for Company support in 2005:

- the maintenance of *falaj* waterworks at Bidiya;
- the provision of basic housing to the people living near right of way at Al Qabil;
- the equipping of an emergency room at the Sabt health centre in Al Kamil;
- the equipping of an information and communication centre at the Omar bin Al Khatab Institute for the blind;
- the “Year of Physics” events at Sultan Qaboos University; and
- the training of women in Dhofar in tailoring, embroidery and cosmetics.

The first three were proposed in connection with the gas loop-line project [see above]; the last three were proposed without connection to any specific field-development or engineering projects.

Local women recruited to patrol the open trenches, as part of the local gas-pipeline work force



The Government's Vision 2020 document stipulated that the nation had to embrace sustainable development so that it could thereby address the challenges of securing a prosperous future for generations of Omanis. In this spirit, PDO is committed to delivering, in partnership with its stakeholders, a programme that sustains a good quality of life, minimises environmental impacts and maximises the profits for Oman as a whole.

The goal is for sustainability to be at the heart of PDO's business. Accordingly, the Company will continue to integrate its six principles of sustainable development into its strategies and plans, in ways such as those listed on this page.

### **Generate Profitability**

- Managing costs effectively to deliver superior and sustained financial performance
- Forming alliances to increase contracting and procurement leverage in the market place
- Maximising recovery of oil and gas reserves through the application of state-of-the-art technologies and techniques

### **Protect the Environment**

- Earning internationally recognised certifications for environmental management systems
- Conducting environmental assessments prior to undertaking major activities
- Adopting a set of globally recognised environmental standards for all operations

### **Respect and Safeguard People**

- Pursuing the ultimate goal of no harm to anyone exposed to our activities
- Promoting high standards of health and safety in the oil and gas industry
- Conducting social assessments prior to undertaking major activities

### **Benefit Communities**

- Recruiting and developing local staff and supporting local education and training programmes
- Procuring local products and services where possible and developing alliances with local suppliers and contractors
- Participating in social projects to build skills and capabilities, transfer technologies and support infrastructure and service improvements

### **Manage Resources Efficiently**

- Maximising the use of renewable energy sources
- Developing and applying technologies that consume less resources and generate less waste
- Promoting tele-conferencing and video conferencing, web-based transactions and e-business

### **Work with Stakeholders**

- Seeking out and listening and responding to those with an interest in our activities
- Providing abundant and timely information about our activities
- Building trusting and mutually beneficial relationships

ECONOMIC



ENVIRONMENTAL



SOCIAL

