



Iraq 5th Bid Round: Analysis

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Introduction

On 26th April 2018, the Iraq Ministry of Oil (MoO) organised its fifth licensing round for the exploration and development of oil and gas fields. This was overseen by the Petroleum Contracts and Licensing Directorate (PCLD). It was held under a new contract model, and was the first licensing round held for a considerable time (the 4th round was held in May 2012)¹.

This paper reviews the outcome of the bid round and its success in achieving the objectives of the MoO and the Government of Iraq.

This paper does not consider in detail all of the contractual terms and conditions in the 5th Bid Round as compared to the previous four bid rounds or to other international terms. The primary focus is on the fiscal terms (defining how the contractor should be financially repaid/rewarded for its investment) and on the process of the bid round.

¹ Other field awards, such as that to Zhenhua for the East Baghdad field, had been made subsequently by direct negotiations.

Context

International context

The international context of the 5th bid round had three important features. Firstly, oil prices fell sharply in late 2014 and remained low through 2015 and 2016. The average Brent crude price, adjusted for inflation, was \$53.05/barrel (bbl) in 2015 and \$43.73/bbl in 2016. By late 2017, the deal between OPEC and non-OPEC countries to restrain production, including Iraq, had succeeded in reducing excess inventories and, combined with some geopolitical concerns over supply, prices reached about \$67/bbl by the end of 2017, and \$74.74/bbl on 26th April (the day of the 5th bid round).

By comparison, when Iraq's first and second bid rounds were held in 2009, the oil price averaged \$68.99/bbl (adjusted for inflation) and \$116.73/bbl in 2012 when the 4th bid round (for exploration) was held. The lower oil price necessarily means that international oil companies have smaller budgets and are more selective in assessing new opportunities. In particular, American companies have focussed more on shale development in the US and have been much less active elsewhere. Occidental has withdrawn from Iraq and Libya; Apache has reduced its presence in Egypt; and Hess, Anadarko and ConocoPhillips have reduced investment outside the US.

Figure 1 shows worldwide exploration and production (E&P) investment, which was \$602 billion in 2010, rose to a peak of \$889 billion in 2014, fell to \$508 billion in 2016 and is forecast to rise to \$584 billion in 2020, still below the 2010 level. Conventional onshore (which includes investment in Iraq) has suffered the greatest fall, with the estimated 2020 level being 20% below that of 2010.

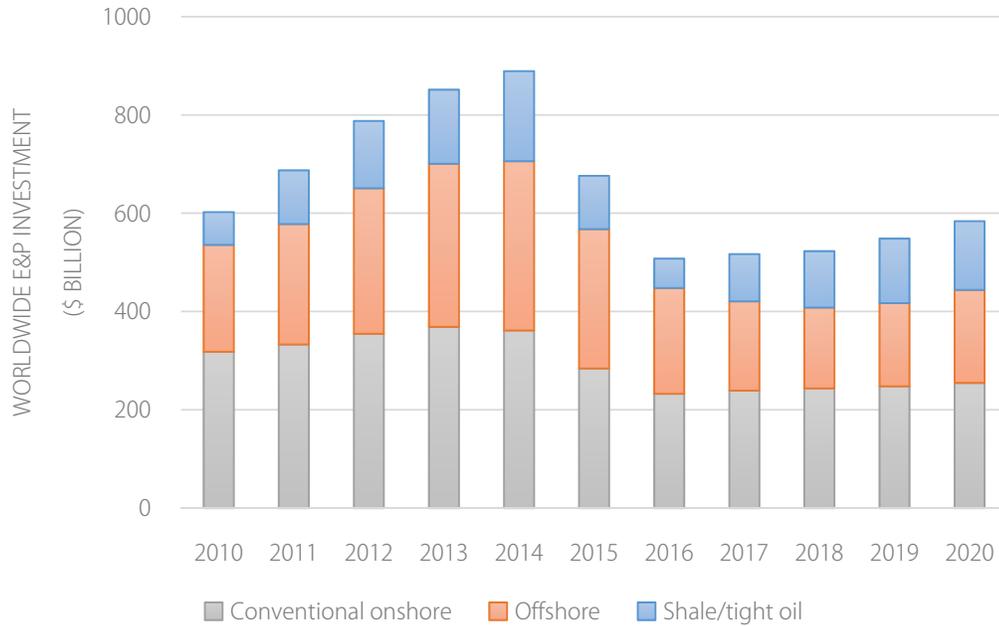


Figure 1 Worldwide exploration & production investment²

Secondly, international oil companies have a wider set of opportunities for new investment than they had in 2009 or 2012. In particular, the rise of US shale resources gives a wide set of capital-hungry possibilities in a politically-stable country with a huge domestic energy market and growing exports. Development of Brazil’s giant ‘pre-salt’ fields has continued. Numerous large gas finds have been made worldwide, for instance in East Africa, North-west Africa, and the Eastern Mediterranean, and Australia and Western Canada also have large discovered gas resources targeting LNG exports.

Several major oil-producing countries have sought to attract new investment in recent years. For example:

- Abu Dhabi restructured its onshore and offshore concessions containing large producing fields, awarding stakes to some new and legacy partners, which included Total, ENI, BP, Inpex, CNPC and others. It is now offering six exploration blocks for competitive bids.
- Iran has offered a long list of oil and gas exploration and development projects under its new ‘Iran Petroleum Contract’³, which is similar to Iraq’s Technical Service Contracts with some improvements. It has awarded two projects to foreign companies (Total/CNPC for Phase 11 of the South Pars gas field, and Zarubezhneft (Russia) along with local firm Dana Energy for the Aban and Paydar oil-fields); others have gone to local companies or are in negotiation, including the giant Azadegan and Yadavaran oil-fields which are on the Iraqi border, adjoining Iraq’s Majnoon and Faihaa fields.

² <https://www.bloomberg.com/news/articles/2018-05-01/opec-s-reason-for-sticking-with-the-cuts-rests-on-shaky-ground>

³ Of course, the US withdrawal from the JCPOA is likely to hamper these developments.

- Mexico has opened up its previously completely nationalised petroleum industry to foreign and private investment, and has awarded blocks onshore and in shallow and deep waters; a number of major discoveries have already been announced.
- Saudi Arabia has announced its plans for an initial public offering (IPO) of 5% of its monopoly state-owned oil company, Saudi Aramco.

These countries have had the following motivations for attracting upstream investment:

- Reduce the burden on the government investment budget;
- Attract leading international skills, technology and business models;
- Shift the risk of new exploration to private companies;
- Improve transparency and reduce corruption;
- Create benchmarks that can be compared with state companies' performance;
- Build relationships with leading political powers and markets;
- Attract further investment in downstream industries following initial engagement in the upstream;
- Drive transformation of the wider economy through bringing in new market-oriented commercial models.

In order to attract E&P investment, Iraq has to offer terms that are competitive with the US, Canada, Brazil, Abu Dhabi, Mexico, Iran and other leading oil producers, when taking into account all other factors (geological potential, security, political stability, logistics, market access, reliability of the legal system, speed and ease of payment, control of corruption, sanctions, etc.).

Thirdly, low oil prices encouraged a deal between OPEC and leading non-OPEC producers (Russia, Oman, Mexico and others) to restrain production. This arrangement has for now reduced excess oil stocks and helped increase prices. But in the longer term, there are concerns about future oil demand, with the rise of electric vehicles, environmental pressures and maturing economies. Leading oil producers have to strike a balance between restraining production now, but ensuring they make the best use of their resources and are not left with oil in the ground which could have been produced economically at an earlier date. This is particularly true for countries with large domestic investment needs and low savings, such as Iraq. Iraq has one of the world's highest reserves-to-production ratios – i.e. it is producing its reserves very slowly (Table 1).

Table 1 Reserves-to-production ratios of leading oil producers

| Country | Oil production 2016 (Mbbbl/day ⁴) | Reserves 2016 (billion barrels ⁵) | Reserves-to-production ratio (years) |
|--------------|---|---|--------------------------------------|
| Venezuela | 2.41 | 300.9 | 341 |
| Canada | 4.46 | 171.5 | 105 |
| Iran | 4.60 | 158.4 | 94.1 |
| Iraq | 4.465 | 142.5 | 93.6 |
| Kuwait | 3.15 | 101.5 | 88.0 |
| UAE | 4.07 | 97.8 | 65.6 |
| Saudi Arabia | 12.35 | 266.5 | 59.0 |
| Russia | 11.23 | 109.5 | 26.6 |
| China | 4.0 | 25.7 | 17.5 |
| USA | 12.35 | 48.0 | 10.6 |

Venezuela and Canada have the longest reserves lives, because of their large unconventional heavy oil reserves (Venezuela’s production is also low because of mismanagement and its economic crisis). Iran is slightly ahead of Iraq on reserves life. But, since Iraq has had limited investment in improved/enhanced oil recovery and new exploration over the past 40 years, it is likely that it could significantly increase its reserves and overtake Iran. Kuwait and the UAE have small citizen populations, highly-developed domestic infrastructure and large sovereign wealth savings; it is not urgent for them to increase production. Russia, China and the US maintain high levels of production from relatively small reserves, through intense focus on improved/enhanced oil recovery and, in the case of the US, hydraulic fracturing of shale/tight reservoirs.

So although Iraq has greatly increased its production in recent years, to become the second-largest producer in OPEC, it is clear that it is still following a very conservative production policy. This is risky as it is not clear whether the world will still require large amounts of oil in 94 years’ time.

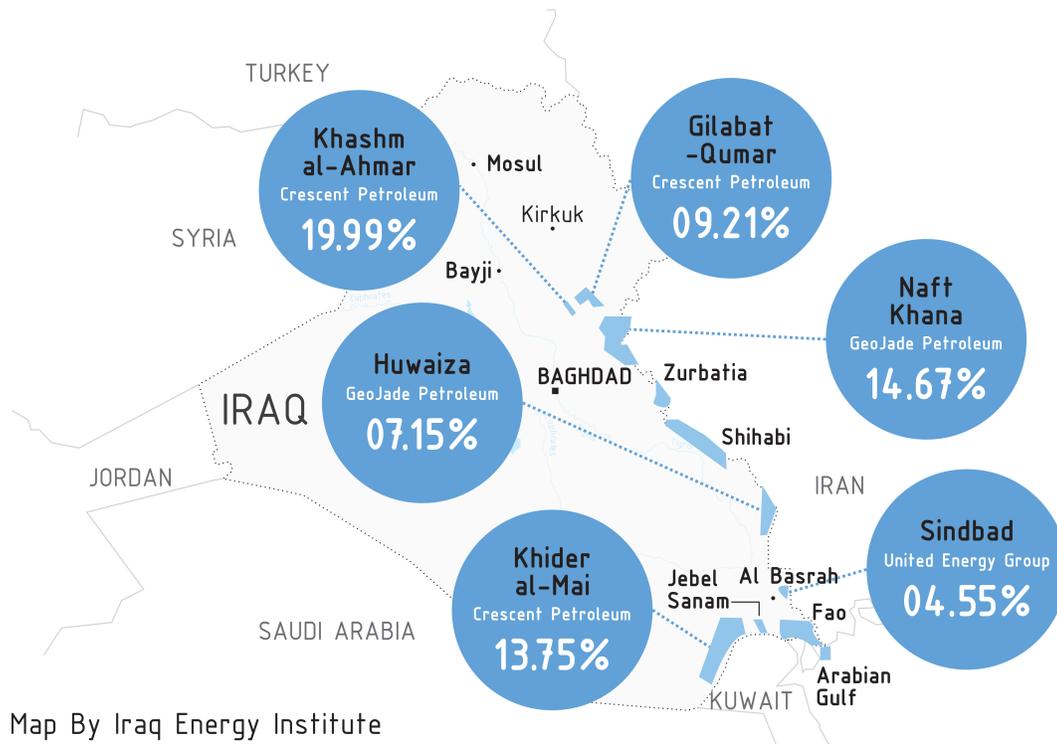
Description of the Bid Round and Results

Iraq’s 5th Bid Round was held on 26th April 2018. It covered eleven blocks along the border with Iran and Kuwait (including one offshore). Four of these blocks were development projects (with existing commercial oil/gas fields) and seven were exploration blocks (with no discoveries, or with past discoveries that have not yet been established as commercial). The location of the blocks is shown in Figure 2. Apart from Sindbad, where an exploration well (Sindbad-2) was drilled in 2013, and some studies, very little work had been done on these blocks since the early 1980s. Some of

⁴ Includes condensate and NGLs

⁵ Includes condensate and NGLs

the blocks (Khashm Al Ahmar, Gilabat-Qumar, Naft Khana) are in areas with serious security threats, while the other blocks are in areas of reasonable to good security.



Map By Iraq Energy Institute

Figure 2 Blocks offered in 5th Bid Round, and winning bidders with revenue share bid

The bid round had a number of objectives, as apparent from outside analysis.

- Attract more international investment into Iraq's oil and gas sector
- Bring investment to neglected regions of the country
- Develop gas to supply the local market and reduce oil consumption for power generation
- Secure Iraq's territorial integrity by developing border areas
- Ensure that no hydrocarbons are lost to neighbouring states by migration in joint fields

The 2018 Iraqi federal budget has an estimated deficit of 22.78 trillion Iraqi dinars (\$19.13 billion), and the country as a whole has a substantial accumulated debt of 65% of GDP⁶. This deficit may be reduced by higher oil prices, but government investment is badly constrained. Currently it is directed primarily at restoring the areas recovered from ISIS, and improving power generation. Iraq needs to attract more foreign direct investment (FDI) to enable the government to direct its investment resources to the most urgent sectors, such as agriculture, water, health and education. The upstream oil and gas sector is the most attractive and successful for attracting FDI.

⁶ Figures in this section from the World Bank, <http://pubdocs.worldbank.org/en/557071507054520670/MEM-Oct2017-Iraq-ENG.pdf>

Within the oil sector in general, other areas are also vital for supporting revenue generation and economic development, and have proved less capable of attracting FDI under the current structure, such as export infrastructure and pipelines, gas transmission, water injection, refining and petrochemicals. Therefore it is preferable for MoO to focus its investment budget on such areas.

Iraq badly needs gas to provide supplies for power generation and industry, and to displace high-value oil currently being burnt and which could be exported, as well as replacing expensive imports of Iranian gas. If sufficient gas is produced for the domestic market, the surplus could be exported, providing an extra stream of revenue and building relations with neighbours. The value generated by gas for the economy, employment and standards of living will be several times its cost in dollars per MMBtu. The development of a field such as Khashm Al Ahmar is very important, particularly as two of the non-associated gas fields awarded in the 3rd Bid Round, Akkas and Mansuriyah, have not proceeded with development because of security problems. Though security has improved at Mansuriyah, it is now held up by contract revisions requested by the companies involved due to the lengthy delay.

A number of the blocks offered include fields which are close to national borders and where neighbouring countries are exploiting hydrocarbon resources on the other side. For example, Huwaiza neighbours Iran's Paydar West oil-field, Naft Khana borders the field of the same name in Iran. It is unlikely that significant amounts of hydrocarbons are migrating under the border, but nevertheless it is important for Iraq to establish its claim on such resources and build up its geological knowledge of the border areas.

The bid round had quite a short timeline due to the approaching Iraqi national elections on 12th May 2018. The MoO recognised that these elections could result in several months' delay in the licence round, with further delays in receiving necessary investment.

The blocks offered were mostly in geologically prospective areas with oil and gas discoveries either within the block or near to it, and supporting geological data (wells, 2D seismic surveys) indicating prospects (potentially oil/gas-bearing structures). The Arabian Gulf (offshore) block was geologically the least-known. Of the discovered fields, reserves at Khashm Al Ahmar are estimated at 251.2 million bbl of oil and 2.2 trillion cubic feet (Tcf) of gas; the oil-in-place at Huwaiza at 2.4 billion bbl (of which only a fraction, perhaps 20-30%, is recoverable); the oil-in-place at Sindbad at 2.15 billion bbl; the oil-in-place at Rachi 420 million bbl (proved) and 238.7 million bbl (possible) and gas-in-place 64.7 billion cubic feet (proved) and 238.7 billion cubic feet (possible); and the oil-in-place at Jerishan 24.5 million bbl (proved) and 70 million bbl (possible)⁷. MoO did not give reserves figures for the other fields.

From these figures, it is clear that this was a very different bid round from the 1st and 2nd bid rounds, which were for large to giant fields such as Rumaila, Zubair, Majnoon, etc. Rumaila has

⁷ All figures from MoO's road-show presentation for the 5th bid round

some 14 billion bbl of remaining reserves, West Qurna (1 + 2) has 44 billion bbl, and even a smaller field such as Gharraf has 1.6 billion bbl. The total reserves of all the discovered fields offered in the 5th Bid Round for which the MoO give figures come to around 1.75 billion bbl. Therefore the terms offered had to be more attractive than for the 1st or 2nd bid rounds in order to attract any interest.

These blocks are also not comparable to auctioning investment rights for Iraq's unique giant fields. Iraq has many other fields and exploration blocks that can be offered in the future. For example, the MoO recently awarded the East Baghdad field to Zhenhua, a Chinese company, and is in negotiations for the development of Kirkuk and its neighbouring fields (with BP); Nassiriya; and Ratawi and Nahr bin Umr (with ExxonMobil). Other medium-sized fields such as Noor, Amara, Rafidain, Dhufriya, Nahrawan, Ajeel and others could be awarded in future. Alternatively, they still remain available for development by MoO and its regional operating companies, along with other 'national effort' fields such as Luhais, Subba and Tuba. There are numerous exploration areas too which can be offered in future, including the blocks that were not awarded in the 4th Bid Round, well-established areas around the current producing fields, as well as unexplored parts of the Western Desert. So the MoO can learn from the strengths and weaknesses of this bid round to improve future bid rounds.

A number of large companies qualified for the 5th Bid Round, such as ExxonMobil, Total and ENI. However, in the end, only ENI placed bids and it did not win either of the blocks it bid for. Zhenhua also bid unsuccessfully. The blocks were won by two smaller Chinese companies, both new entrants to Iraq (GeoJade and United Energy Group), and by Crescent Petroleum which previously had not had any assets in federally-controlled Iraq (it has contracts with the Kurdistan Regional Government, KRG).

The results of the bidding are shown in Table 2. Six out of the 11 offered blocks were awarded. The five blocks that received no bids were pure exploration blocks (with no existing discoveries) and hence higher risk.

Table 2 5th Bid Round Results

| BLOCK | EXISTING FIELDS | BIDDERS | NET REVENUE SHARE BID |
|------------------------|---|----------|--------------------------|
| Shihabi | | No Bids | Ministry Maximum: 10.97% |
| Zurbatiya | | No Bids | Ministry Maximum: 04.77% |
| Jebel Sanam | | No Bids | Ministry Maximum: 14.00% |
| Naft Khana | Naft Khana, Nau Doman, Jaria Pika, Tel Ghazal | ENI | 21.19% |
| | | GeoJade | 14.67% MM: 24.45% |
| Huwaiza | Huwaiza | GeoJade | 07.15% MM: 07.16% |
| Sindbad | Sindbad | ENI | 14.00% ⁸ |
| | | UEG | 04.55% MM: 06.11% |
| | | Crescent | 04.89% |
| Fao | | No Bids | Ministry Maximum: 12.80% |
| Khidher al-Mai | Rachi, Jreishan, Khidher Al Mai | Crescent | 13.75% MM: 13.76% |
| Arabian Gulf | | No Bids | Ministry Maximum: 22% |
| | | Crescent | 09.21% MM: 16.65% |
| Gilabat-Qumar | Gilabat, Qumar | GeoJade | 13.15% |
| | | Zenhua | 15.91% |
| Injana-Khashm Al Ahmar | Injana, Khashm Al Ahmar | Crescent | 19.99% MM: 20% |

*Winning Bids Highlighted in Blue

⁸ This is the figure reported, though higher than the Ministry's maximum.

Fiscal Terms and Comparison

Principles of Fiscal Systems

Before discussing the specific terms of the 5th bid round, some general observations have to be made on petroleum fiscal systems. The purpose of such a system is to define the terms by which an investor in the exploration and development of oil and gas resources is compensated for the investment they make, the risks they take and the technology and expertise they contribute.

In most countries, subsurface resources belong to the country (and its people) and are not privately owned. The government therefore has the duty of ensuring the best return on these resources. Ideally, the petroleum fiscal system will ensure the government retains all the *rents* (the returns in excess of those obtained in a competitive market), and the investor receives only competitive market returns, after accounting for the risk they take and any particular skills they apply. Uncertainty in geology, costs and the future evolution of oil and gas prices make it impossible to determine a perfect system, but there has to be a reasonable balance between the interests of the government and the international oil company investor.

Fiscal terms also have to align interests. Within a well-designed contract, both the international oil company and the government should want to expedite speedy and efficient operations, maximise production (within constraints such as OPEC limits), maximise ultimate recovery/reserves, discover additional fields, and reduce costs. This is in addition to the standard requirements of respecting the law, environment, safety and local communities. The contract should also ensure government objectives such as training national staff, promoting wider national and regional economic development, and raising the country's technological capability.

Very tight fiscal terms may be suitable for giant fields with low costs. However, even in this case, they can prevent a company from economically developing other opportunities within the same field or block – for instance, deeper or lower-quality reservoirs, flared gas capture, improved/enhanced oil recovery, or exploration of more risky prospects. It is not very satisfactory to renegotiate terms later to make these opportunities economic, or to divide them between different operators in the same area. Therefore the contract should be flexible enough to maximise government rents from the giant, low-cost resources while still allowing the investor to develop the more difficult opportunities.

Companies will bid competitively considering all the conditions of the contract. Therefore, for instance, including a royalty, a signature bonus, cost recovery limits, higher taxes, limits on revenues from by-products, training fees or other factors will cause companies to bid a lower

revenue/profit share or remuneration fee. Instead of setting very tough terms initially, governments are usually better-advised to produce an attractive contract, maximise the number of capable companies bidding for it, and then achieve a high share of value for government by creating the conditions for companies to bid aggressively against each other.

It is important to understand that *countries* also operate within a competitive world market for oil and gas investment. Fiscal terms therefore have to be realistic against competing countries, when allowing for the size and quality of their geological resources, the ease of operating in the country, its level of political and security stability, quality of infrastructure, and so on. As noted above, in recent years, several countries with large hydrocarbon resources have opened their sectors to investment. International oil companies have a choice of which countries to bid in. At a time of relatively lower oil prices and constrained budgets, they will be less aggressive in bidding and have to be more selective about investing in particular countries.

5th Bid Round Terms

The fiscal terms for the 5th bid round represent an evolution on the Technical Service Contract (TSC) terms which were used for the first four bid rounds. In all of these contracts, the contractor (an international oil company or group of companies) invests to explore for (in the case of exploration contracts) and develop oil or gas fields. Subject to meeting performance metrics, it is repaid its costs, plus a fee. It does not own oil reserves or resources in the ground, which remain the property of the people of Iraq. It does not have entitlement to a share of oil it produces (as is the case under a Production Sharing Contract, PSC).

Internationally, three major types of petroleum contracts are recognised: tax-royalty, production sharing and technical service. In a tax-royalty system, the investor is typically granted ownership of oil or gas it discovers in the ground, and pays a *royalty* (share of gross revenues or production) to the government or (in the US) mineral rights owner, then pays tax on its profits (revenues minus royalties and permitted costs).

In a production-sharing contract, the government owns the oil or gas in the ground, but the contracting company has an entitlement to a share of production at the wellhead (or its financial equivalent). It may pay a royalty to the government; then it can recover its costs from a defined share of the remaining production; and then remaining production is divided between the company and government according to a formula, which may vary with production levels, oil price, profitability or other measures. Finally, the company may pay tax on its profits (or the deemed tax is included in the government's profit share).

In a technical service contract, the contractor invests its capital to find and/or develop oil and gas; it does not own the resources in the ground or at the wellhead, but it is compensated for its investment by recovering its costs from a defined share of revenues; it then receives a remuneration fee which provides a return on its invested capital.

In all these systems, the government usually retains wide powers of approval and regulation. It may have a direct government share in the contract, but even if not, the Ministry of Oil,

national oil company and/or national regulator has oversight. Of course, the more capable the regulatory body, the better-able it will be to look after the government's and national interest, while allowing the contractor to operate effectively.

As Table 3 shows, major oil- and gas-producing countries make use of a range of petroleum legal and fiscal systems. Production Sharing Contracts are widely used, even by major producers. Iran and Kuwait have decided that production-sharing contracts are not constitutionally permissible.

Table 3 Petroleum fiscal systems for major producers

| COUNTRY | PETROLEUM FISCAL SYSTEM |
|-------------------------|---|
| IRAQ | Technical Service Contract (with revenue sharing for 5 th round) |
| IRAQ (KURDISTAN REGION) | Production Sharing Contract |
| UAE (ABU DHABI) | Tax-royalty (but fiscal terms similar to technical service contract) |
| IRAN | Technical Service Contract with revenue sharing |
| QATAR | Production Sharing Contract |
| KUWAIT | Technical Service Contract |
| SAUDI ARABIA | Tax-royalty (only on a limited basis for gas exploration) |
| OMAN | Production Sharing Contract |
| ALGERIA | Production Sharing Contract ⁹ |
| LIBYA | Production Sharing Contract |
| EGYPT | Production Sharing Contract |
| MEXICO | Production Sharing Contract |
| BRAZIL | Tax-royalty; Production Sharing Contract (for pre-salt) |
| RUSSIA | Tax-royalty and Production Sharing Contract |

Companies have complained that the original TSC terms were too tight and have made their operations in Iraq uneconomic. For instance, Statoil exited West Qurna-2 in 2012, Occidental left Zubair in 2015, Shell and Petronas announced their withdrawal from the Majnoon field in 2017, and Shell sold its interest in West Qurna-1 in 2018. This has left Iraq dependent on a relatively small and shrinking circle of large oil companies to operate its biggest fields: ExxonMobil, BP, ENI, CNPC (PetroChina), CNOOC, Petronas, Lukoil, and Gazprom Neft¹⁰.

The main differences between the fiscal terms of the TSCs for the first four bid rounds, and the Exploration, Development and Production Contract (EDPC) or Development and Production Contract (DPC) of the 5th bid round are as follows.

⁹ Algeria also makes limited use of concession and technical service contracts

¹⁰ Shell remains involved in the Basra Gas Company along with Mitsubishi; Total has a non-operating stake in Halfaya; Pertamina, Itochu, Japex and others have non-operating stakes in some fields, Bashneft (owned by Rosneft), TPAO of Turkey, and Inpex (Japan) have exploration assets, while smaller companies such as Zhenhua, Dragon Oil and Kuwait Energy are involved in smaller assets. Chevron and Total are believed to be interested in Majnoon.

| | TSC, BID ROUNDS 1-4 | EDPC / DPC, BID ROUND 5 |
|----------------------------|---|---|
| SIGNATURE BONUS | Non-recoverable cash payment, varying per field ¹¹ , typically \$100-500 million; \$15-25 million for exploration blocks | \$10 million for DPC; non-recoverable |
| COMMERCIALITY BONUS | None | \$15 million for EDPC, payable when commerciality declared; non-recoverable |
| STATE PARTNER | 25% stake, costs carried by contractor and recovered from future cost recovery (no carried partner in Bid Round 4) | None (however if the contractor sells part/all of its interest, the Iraqi party has the first right of refusal to acquire that stake on the same terms) |
| ROYALTY | None | 25% (paid to the relevant regional oil company (ROC ¹²)) |
| TRAINING FEE | \$5 million per year, non-recoverable | Annual fee; amount left blank in model contract |
| INFRASTRUCTURE FUND | Payments to be made for the development of infrastructure in the governorate of the field; cost-recoverable | Payments to be made for the development of infrastructure in the governorate of the field; cost-recoverable |
| COST RECOVERY | Begins when production target reached; from maximum of 50% of revenues (70% for Bid Round 4 for exploration blocks) | Begins when commercial production begins; from a maximum share of revenues after royalty, from 30% if oil price is \$21.5/bbl or below, to 70% if oil price is \$50 per barrel or above |
| REMUNERATION FEE | Fixed fee per barrel produced, a biddable element (typically in the range \$1-6 per barrel) | Share of the revenues remaining after royalty, a biddable element, with winning bids ranging from 4.55-19.99% |
| PERFORMANCE FACTOR | Remuneration is reduced proportionately if production during the plateau period is below the committed plateau target | Remuneration is reduced proportionately if production in a quarter is below the rate approved for that quarter in the latest approved budget |
| R-FACTOR | Remuneration fee reduces to 30% of original level with R-factor (ratio of aggregate cash receipts to aggregate expenditure) ¹³ | Not used |
| INCOME TAX | 35% of remuneration fee | 35% of remuneration fee |
| TAX ON TRANSFER | None | 35% if part/whole of the contract sold to another party |

¹¹ The Rumaila TSC in Bid Round 1 featured a bonus which was cost-recoverable with interest; the gas fields awarded in Bid Round 3 did not feature a signature bonus

¹² The operating unit of MoO responsible for the area of the contract; for instance, for fields near Basra this is the Basra Oil Company (BOC)

¹³ In some cases, the R-factor has been removed by later re-negotiation

The introduction of the royalty and the sliding scale on cost recovery (Figure 3) was intended to avoid the situation where, at a time of low oil prices, Iraq is faced with large repayments to contractor oil companies. If oil prices are low, the cost recovery will be phased over a longer period. The royalty (25%) guarantees the government a minimum share of revenues. However, it is possible that it could make marginal (small or high-cost) fields economically unviable. In this case, the terms could be re-negotiated, or if the company chooses not to develop the field, it could be re-offered for bidding or negotiation under terms more favourable to the investor.

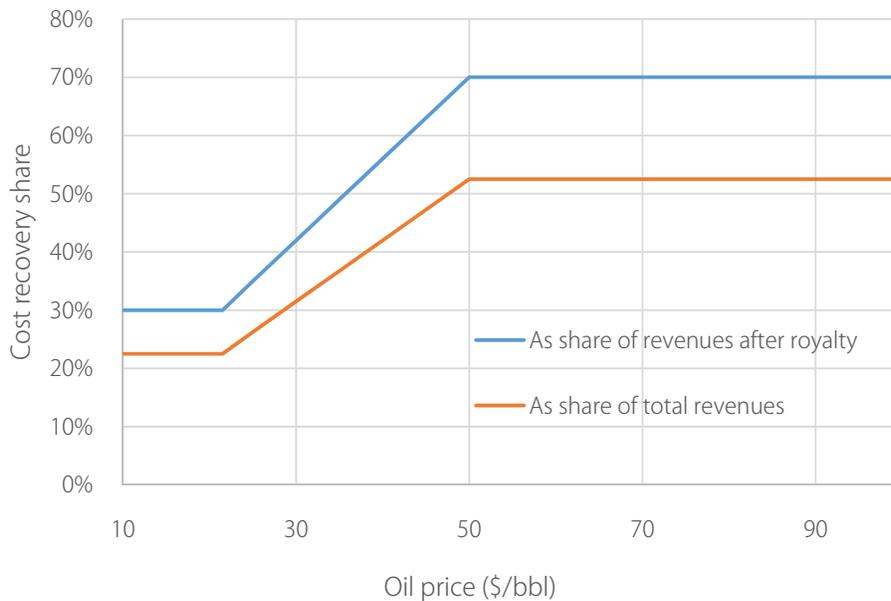


Figure 3 Cost recovery share

The lower cost recovery share is also intended to encourage the oil companies to exercise greater cost control (this has been a complaint made by the MoO concerning their performance in some other fields). The previous fixed remuneration fee has been replaced by a share of revenues. This better aligns the interests of the MoO/Iraqi government and investor. If oil prices increase, both will benefit, and conversely both will bear some of the pain if oil prices fall. This better ensures the contract will remain competitive over its life (up to 25 years for the DPC and 34 years for the EPDC).

The ‘transfer fee’ (spoken of as a capital gains tax, though in fact it is on the whole value of the transaction, not just the gain) if a company sells its interest is intended to ensure the government achieves some share of benefits from a company taking on a block and then selling it on. However, it is potentially problematic as it would make transactions hard to agree, leaving assets in the hands of companies not best suited to develop them. It also does not allow for the expenditure a company may have put into the asset (and the risk it has taken) prior to selling it. At any rate, it should be made deductible against future tax payments, otherwise it amounts to a form of double taxation.

Figure 4 and Table 4 show the split of revenues of a single barrel produced under the contract between government and contractor. This is shown at three different oil prices (\$21.5/bbl, for the minimum cost recovery in the contract, \$50 per barrel and \$100 per barrel) and two different costs (capital plus operating costs) to be recovered, \$5/bbl and \$20/bbl (a low-cost versus a high-cost field). This assumes a contractor revenue share of 10% was bid and accepted (this is in the middle of the values actually bid in the 5th Bid Round). This split does not include the signature/commerciality bonus nor the training fee, since the effect of these depends on the number of barrels produced, nor the 35% transfer fee (which would only come into effect if a company sells its interest). This is only an illustrative snapshot for one accounting period, and does not capture the full economic effect of the contract.

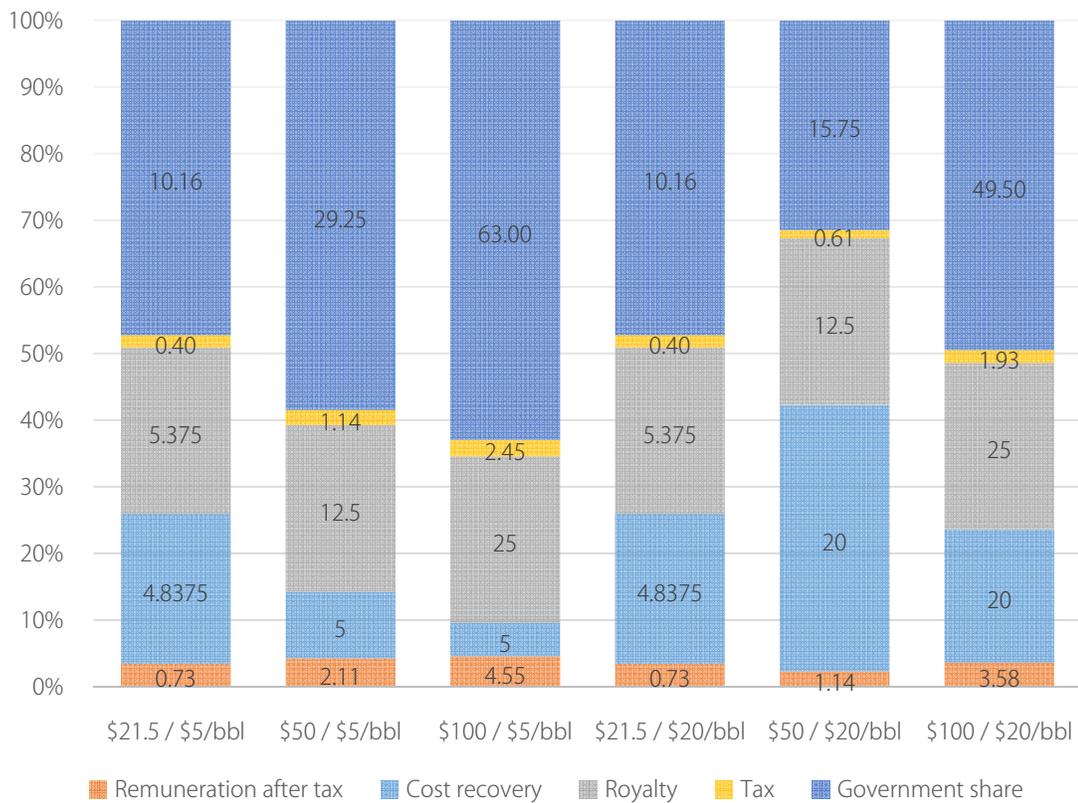


Figure 4 Split of revenues in different scenarios

Table 4 Split of revenues in different scenarios

| COSTS (\$/BBL) | 5 | 5 | 5 | 20 | 20 | 20 |
|---------------------------|------|-----|-----|---------------------|-----|-----|
| OIL PRICE (\$/BBL) | 21.5 | 50 | 100 | 21.5 | 50 | 100 |
| COST RECOVERY | 23% | 10% | 5% | 23% | 40% | 20% |
| REMUNERATION AFTER TAX | 3% | 4% | 5% | 3% | 2% | 4% |
| ROYALTY | 25% | 25% | 25% | 25% | 25% | 25% |
| TAX | 2% | 2% | 2% | 2% | 1% | 2% |
| GOVERNMENT SHARE | 47% | 59% | 63% | 47% | 32% | 50% |
| TOTAL IRAQ SHARE REVENUES | 74% | 86% | 90% | 74% | 58% | 76% |
| TOTAL IRAQ SHARE PROFIT | 97% | 95% | 95% | >100% ¹⁴ | 96% | 96% |

It can be seen that the split of the revenues is highly in the favour of the Iraqi state. The company takes between 2-5% of the gross revenues in remuneration after tax (excluding its cost recovery).

A more detailed analysis can be carried out using an example field (with annual production, capital and operating costs, at an assumed oil price of \$50/bbl), to compare the 5th Bid Round contract with other fiscal systems, including the effect of bonuses, training fees and state carried interest, and again with an assumed bid of 10% net revenue share. The field taken in this case is Gharraf, one of the smallest awarded in the 1st and 2nd bid rounds. However, Gharraf, with projected peak production of 230 kbbbl/day¹⁵, and about 1.5 billion bbl of reserves, is much larger than the fields offered in the 5th Bid Round. This is compared to three other fiscal systems: Gharraf under the original TSC terms (2nd Bid Round, with a remuneration fee of \$1.49/bbl), Abu Dhabi (Upper Zakum field)¹⁶, and the Kurdistan Region of Iraq (Shaikan field)¹⁷.

¹⁴ In this case, the total profit is only \$1.5/bbl (\$21.5 oil price - \$20 costs) but the Iraqi government takes more than \$1.5, because the contractor cannot recover all of its costs (costs to be recovered are \$20/bbl but only $21.5 \times 75\% \times 30\% = \4.84 /bbl is available for cost recovery). The contractor might be able to recover its costs in future years when production is higher and/or costs are lower.

¹⁵ The bid plateau rate; <https://www.reuters.com/article/us-iraq-oil-contracts/oil-companies-temper-iraqs-dreams-of-production-expansion-idUSKCN1GQ1ID>

¹⁶ Not including signature bonuses, which was not public for Upper Zakum and which varies widely by field in Abu Dhabi

¹⁷ The KRG PSCs are all slightly different

Table 5 Economic results of 5th Bid Round TSC compared to other systems¹⁸

| | IRAQ TSC, 5 TH BID ROUND | IRAQ TSC, 2 ND BID ROUND | ABU DHABI (UPPER ZAKUM) | KURDISTAN REGION OF IRAQ PSC (SHAIKAN) |
|------------------------------|-------------------------------------|-------------------------------------|-------------------------|--|
| COMPANY NPV ¹⁹ | 177 | -560 | 243 | 489 |
| GOVERNMENT NPV ²⁰ | 7638 | 8375 | 7571 | 7326 |
| COMPANY IRR ²¹ | 15.1% | -3.5% | 16.2% | 17.7% |

The following points can be observed:

- The 5th Bid Round terms would provide a reasonable economic return for the contractor for a field such as Gharraf (companies typically target a rate of return (IRR) of 15% or greater). A smaller/higher-cost field would provide lower returns, and exploration would provide lower returns too when accounting for risk.
- Companies would probably have bid a lower net revenue share than 10% if a field such as Gharraf had been available in the 5th Bid Round; the winning bid for the Sindbad field was 4.55%, and for the Huwaiza field 7.15%.
- The 2nd Bid Round terms are completely uneconomic for the contractor, providing a negative rate of return. No company would accept such terms in hindsight; the reason they were bid for Gharraf is presumably because costs turned out to be higher than expected and production lower and/or delayed. The smaller and/or higher-risk fields of the 5th Bid Round would be even less suitable for such terms.
- If required to bid under the 2nd Bid Round terms, companies would bid a higher \$/bbl figure, as they did in the 4th Bid Round. To match the NPV of the 5th Bid Round terms, and assuming the state carried interest were removed, the bid would have to be about \$3.5/bbl.
- The 5th Bid Round terms provide a lower return for the contractor (and a higher value for the Iraqi government) than the Abu Dhabi terms and the Kurdistan Region's PSC²²

On this basis, there is no evidence that the 5th Bid Round terms are unusually favourable for the contractor. The Iraqi government retains about 98% of the net present value of the field. Its share of value is somewhat higher than would be obtained under the terms used in Abu Dhabi or the Kurdistan Region. The contractor's internal rate of return is just about enough for an economically attractive project, and certainly not excessively high. If the terms had been made more stringent,

¹⁸ Qamar Energy modelling

¹⁹ Company (contractor) net present value at 10% discount rate

²⁰ Government net present value at 10% discount rate

²¹ Internal Rate of Return

²² Geological, political and payment risks are higher in Kurdistan, and so the regional government had to offer more attractive terms to encourage investment; however, it is notable that the terms are not much more favourable for the contractor than a stable, highly prospective jurisdiction such as Abu Dhabi

then either there would have been fewer or no bidders; or they would have bid higher revenue shares, possibly higher than the MoO's maximum.

There was a further change in the procedure for the 5th Bid Round as compared to the first four. In the first four, the Ministry of Oil set a maximum bid per block that it was prepared to accept, but did not reveal it until companies had made their bids. This allowed for the possibility that companies might bid below the maximum even if they were the only bidder, but created the risk that blocks would go unawarded if all the companies bid too high. In the 4th bidding round (for exploration blocks) of May 2012, four out of 12 blocks were awarded, and in each case there was just a single bidder (or bidding consortium) for that block. In the case of Block 12, the consortium of PetroVietnam, Premier Oil and Bashneft bid \$9.85/bbl, which was rejected, but after negotiations, Premier and Bashneft accepted \$5/bbl, with PetroVietnam choosing to withdraw. Premier exited in December 2015.

In the 5th Bid Round, the Ministry revealed its maximum revenue share before bids were made. In the event, three of the blocks were won by a single bidder which bid just below the ministry's maximum. Three blocks were bid competitively with winning bids that were substantially below the ministry's minimum, and the other five blocks did not receive any bids.

Other contract and bidding features

Transparency

Following the bid round, the MoO released the model EDPC and DPC. During the bid round, the MoO's maximum revenue share and the bids made were revealed. It would have been preferable to have made the contracts publicly available prior to bidding. Qualification procedures were also not clear, though there is no evidence that any company was particularly favoured or unfairly barred. However at least the result is fully transparent, and independent analysts can calculate the economic results of each contract awarded.

Another new feature is the contractual requirement that the contractor should comply with the Extractive Industries Transparency Initiative (EITI), which requires disclosure of all payments made to governments, including the confirmation of the actual sales price of oil under the Heads of Export Oil Sales Agreement, as part of the Iraqi government's effort to return to good standing with the EITI after its suspension last November.

Qualification

For the 5th bid round, previously-qualified companies were allowed to qualify again, and new entrants were also allowed. Some of the qualified companies were new entrants to Iraq and relatively small, but appear to have the required technical and financial capabilities. Qualified companies are shown in Table 6; note that some previously-qualified firms, such as Shell, BP, CNPC (PetroChina) and Kuwait Energy, chose not to participate. The qualification process was rather non-transparent and a clear statement of the steps and criteria could be placed on the MoO website.

Table 6 Qualified companies for the 5th Bid Round

| QUALIFIED COMPANY | COUNTRY |
|---------------------------|---------|
| BASHNEFT | Russia |
| CNOOC | China |
| CRESCENT | UAE |
| DANA GAS | UAE |
| DRAGON OIL | UAE |
| ENI | Italy |
| EXXONMOBIL | USA |
| GEO-JADE | China |
| LUKOIL | Russia |
| TOTAL | France |
| UNITED ENERGY GROUP (UEG) | China |
| ZARUBEZHNEFT | Russia |
| ZHENHUA | China |

Under Hussein Shahrstani (oil minister 2006-10, deputy prime minister 2010-14), the MoO adopted a policy of 'black-listing' companies which took up an interest in exploration and production (E&P) contracts in the autonomous Kurdish region of Iraq (KRI). The MoO considered these contracts to be illegal and barred companies which had signed them from qualifying to bid in its licence rounds. This included Sinopec (China), which was barred from the 2nd licence round of December 2009, and Hess (US) which was banned from the 4th licence round of May 2012.

In November 2011, US supermajor ExxonMobil, which was operating the West Qurna-1 (WQ1) project in southern Iraq, signed for six production sharing contracts (PSCs) with the Kurdistan Regional Government (KRG). In response, the MoO halted discussions with it over leading the Common Seawater Supply (CSSP) project, and after negotiations, ExxonMobil reduced its share in WQ1 from 60% to 25% by selling stakes to PetroChina and Pertamina. Nevertheless, it remained operator and investor, and has now returned to negotiations for the South Integrated Project (SIP) including the development of the Nahr Bin Umr and Ratawi fields along with the CSSP and other work. Total and Gazprom Neft, which had also taken up stakes in the KRI, and also had contracts in federally-run Iraq, were not forced to leave. The 'black-list' policy was therefore not applied consistently even in 2012, and since there have been no subsequent bid rounds, the policy has not been tested since.

In the 5th bid round, companies qualified to bid included Gazprom Neft, Total, ExxonMobil, Dana Gas and Crescent Petroleum, which are all active in the KRI. In the end, only Crescent Petroleum placed a bid, and it won three blocks. Under Article 8 of the contract, the MoO retains the right to terminate if the contractor violates the law or any directive of the government or MoO. The position of the KRG with relation to Baghdad has changed significantly since the independence referendum of September 2017 and the subsequent return of the Kirkuk area to federal government control.

Conclusions

This paper is not intended to carry out an exhaustive analysis of all the features of the contract and the 5th Bidding Round. However, the following observations can be made.

Given the short timeline, the MoO did well to award six out of the 11 available blocks. The other five could be offered in future. The bidding process was much more competitive than the 4th Bid Round, as several of the blocks attracted multiple bids well below the Ministry's maximum. The process was more successful than the 4th Bidding Round as there was more competition and more blocks were awarded. The MoO can now consider, after the election, offering the remaining five blocks, possibly with the inclusion of other undeveloped blocks or fields, and with some improvements to the contract and process as discussed below.

The 5th bid round contracts cannot be simplistically compared to the earlier rounds, as the first and second rounds were for giant fields with very low costs. It is obvious that a field with reserves of 100 million bbl, or an exploration block with no proved resources, will require more attractive terms for the investor than a field such as Rumaila or West Qurna or even Gharraf. The industry landscape has also changed since then, with more international opportunities for companies and lower oil prices and investment levels.

Some investors may also have been deterred by issues including: the continued insecure situation in parts of Diyala governorate; the presence of assets along the Iranian border (with potential for disputes or for requirements to deal with Iranian counterparts); the presence of unexploded ordnance from past wars (an issue for the Shihabi, Zurbatiya and Huwaiza blocks in particular); and the relatively small size of the fields offered, not attractive to supermajor companies already established in Iraq.

A simple economic analysis of the results for a sample field show that the 5th Bid Round terms are not unusually generous to the contractor; in fact, they retain more value for the Iraqi government than in two regional comparisons, the Kurdistan region and Abu Dhabi.

The value Iraq will receive from these contracts cannot be simply measured in the production share achieved. The correct comparison is between the value the country will obtain with the investment, and the zero value it would achieve if more stringent terms made it impossible for investors to bid. If the investor receives a slightly higher revenue share, and in return can increase production or reserves, or reduce costs, then the increased value to the Iraqi government is far greater than the small extra payment to the investor.

If more time had been available for analysis and clarification of the blocks offered and of the contract, if the road-show had been more extensive, and if certain features of the contract had been improved, then it might have been possible to attract other large companies to bid. As noted, Lukoil, ExxonMobil, ENI and Total were present at the bidding round but chose either not to bid at all or to make not very competitive bids. ENI, in fact, bid deliberately much higher than MoO's maximum for Sindbad, presumably to emphasise that it found the terms unviable. The qualification by mid-size companies, technically and financially capable to explore the given blocks, is to be welcomed though. They increase competition and allow Iraq to receive better terms; and they may be more aggressive in pushing ahead with exploration than a large firm.

Iraq could also consider, for future rounds, allowing companies to qualify as non-operators, having to demonstrate only financial (not technical) capability. This procedure has been followed, for example, in Lebanon's exploration bid round (which concerned technically-challenging deep-water). This could allow qualified local private Iraqi companies to enter the industry, with careful safeguards against corruption or inappropriate political influence. It would also allow smaller but sufficiently financed companies to enter Iraq and hence add to the pool of available finance.

Two negative features can be observed in the terms. Firstly, the approval limits for expenditure are lower than those in previous contracts (up to \$5 million to be approved by the operator, up to \$20 million by approval of the Joint Management Committee (JMC) and above that by the relevant Regional Oil Company (ROC) of the MoO. This is intended to facilitate cost control, but it will slow down operations and impose a large bureaucratic burden on the MoO. Secondly, the proposed 'Transfer Fee' will prevent companies from efficiently selling their interest, possibly when a company more capable of operating a given field is interested. At least, this Transfer Fee should be offset against future tax.

Overall, the 5th Bid round appears to have been more successful than most observers expected; several prospective blocks were awarded on terms that are favourable to Iraq and will require the winning companies to work hard to achieve reasonable economic returns. The process and contracts are not perfect, but the MoO's part of the procedure has been completed before the Iraqi elections.

Appendix

List of Fields and Blocks Offered

Source: The Ministry of Oil

1. Gilabat & Qumar gas fields

- Gilabat: The field is located in the northeastern part of Iraq within the province of Diyala, about 140 km northeast of Baghdad.
- Qumar: The field is located in the northeastern part of Iraq within close to the boundary of Diyala province near Kifri city. It is located 20 km west of Gilabat and 35 km north east of Khashim Al-Ahmar field.

2. Khashim Al Ahmar & Injana gas fields

- Khashim Al Ahmar: The field is located to the south-west of Gilabat field.
- Injana: The field is located in Diyala province, about 130 km north east of Baghdad.

Iraq-Iran Border Area

3. Naft Khana Block:

Located in Diyala province including Naft Khana, Nau doman, Jaria Pika and Tel Ghazal in addition to the South Naft Khana structure.

4. Zurbatiya:

Located within Wasit and Diyala provinces.

5. Shihabi:

This block is located within Missan and Wasit provinces.

6. Huwaiza:

Located in Missan province.

7. Sindbad:

Located in Basra province.

The Exploration Blocks on Iraqi-Kuwaiti Border Area.

8. Fao Block:

Located in Basra province near the Iraqi-Kuwaiti-Iranian borders.

9. Jabal Sanam:

Located in Basra province.

10. Khider Mai:

Located in Basra and Al-Muthana provinces.

Offshore – Arabian Gulf

11. Arabian Gulf:

Located offshore in the regional Iraqi Gulf waters.

Summary of Fields and Blocks Offered

Source: The Ministry of Oil

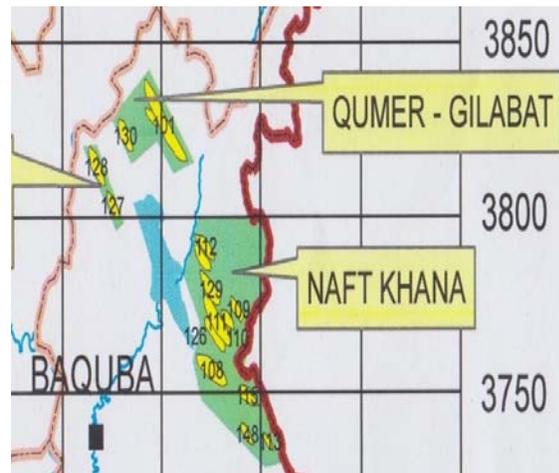
Gilabat

The field is located in the northeastern part of Iraq within the province of Diyala, about 140 km northeast of Baghdad. It is 30 km in length and 5 km in width. Two wells were drilled (Gilabat-1) in 1958 and (Gilabat-2) in 1959, the results of these wells was neglected due to the presence of high pressure layers. A third well (Gilabat-3) was drilled in 1978, and oil evidence has been found in Jeribe formation.

Qumar

The field is located in the northeastern part of Iraq within close to the boundary of Diyala province near Kifri city. It is located 20 km west of Gilabat and 35 km north east of Khashim Ahmer field. The length is about 40 km and the width is 8 km. In 1979, the first well (Qumar -1) was drilled to a depth of 3200 m. (Shiranish formation), oil and gas evidences has been obtained from Jeribe formation.

| Gilabat – Qumar Fields | |
|------------------------|--------|
| ZONE-38 | |
| N | E |
| 3843000 | 493474 |
| 3828894 | 474276 |
| 3816423 | 484613 |
| 3822166 | 497248 |
| 3813633 | 505781 |
| 3816751 | 516119 |



Khashim Ahmar

The field is located to the south-west of Gilabat field, and is about 11 km in length and 3 km in width. The first well was drilled in 1927. The drilling was stopped at a depth of 1326 m. due to technical problems. The second well was drilled in 1980 and reached a depth of 1705 m. where gas and oil evidences has been recognized. The estimated oil reserve is about 251.2 million barrels and free gas reserve in Jeribi formation is about (2200) TSCF.

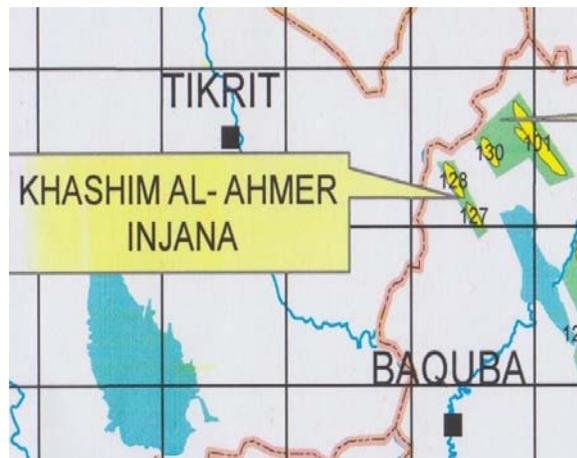
Injana

The field is located in Diyala province, about 130 km north east Baghdad. Four wells has been drilled during 1927-1930. Gas evidences were obtained from Lower Fares formation. The well Injana-5 was drilled in 1958 and gas and oil evidences were obtained.

Khashim Ahmar & Injana fields

ZONE-38

| N | E |
|---------|--------|
| 3821363 | 467332 |
| 3820824 | 460334 |
| 3796535 | 476988 |
| 3799394 | 480958 |

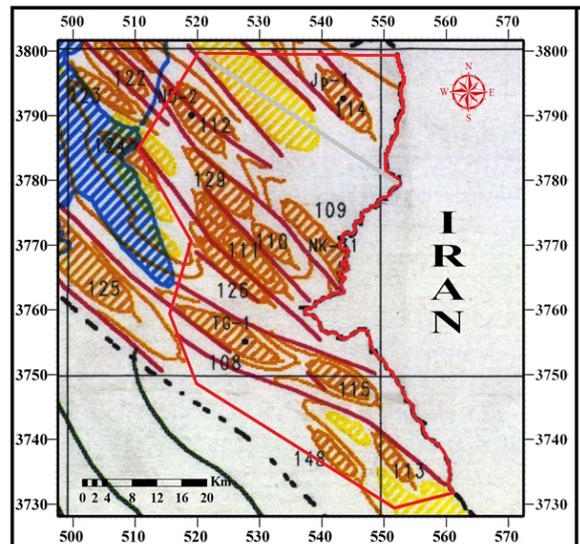


Naft Khana Block

Located in Diyala province and including the following fields and structural anomalies:

- No. (113) Mandali.
- No. (115) Habib.
- No. (126) Hattab.
- No. (111) Nazazdagh.
- No. (124) Sa'adiya.
- No. (129) Uqba.
- No. (110) South Naft Khana.
- No. (148) Battan
- No. (108) Tel Ghazal field.
- No. (109) Naft Khana field.
- No. (112) Nau Doman field.
- No. (114) Jaria Pika field.

| NAFT KHANA | |
|------------|--------|
| ZONE-38 | |
| N | E |
| 3800000 | 552563 |
| 3800922 | 518455 |
| 3784924 | 510419 |
| 3770646 | 518985 |
| 3759424 | 515526 |
| 3748630 | 519846 |
| 3729419 | 51646 |
| 3730000 | 560000 |



Zurbatiya Block

This block is located within Wasit and Diyala provinces which include Zarbatiya No. (106) and Tariq No. (269) structures.

Zurbatiya structure is considered one of the giant borderline structures, it is about (40) km long and (9) km wide.

It was seismically surveyed in 1978. The results in the northern part of Mandali-Badra region which includes the Zurbatiya structure was not good, due to the rough terrain. In addition, a part of the structure was not covered by the seismic survey, especially in the areas adjacent to the Iraqi borders.

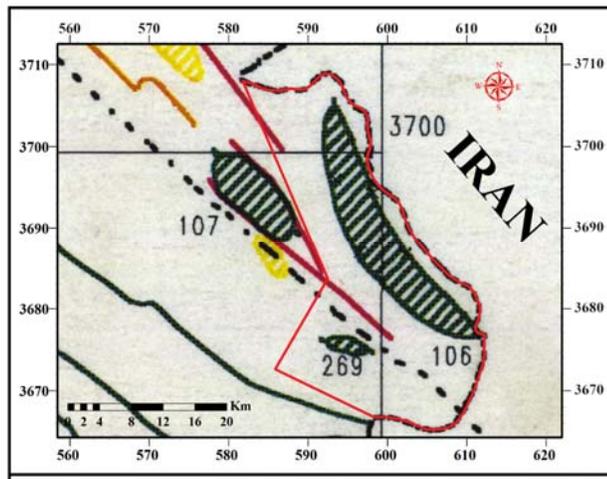
Most of Iraqi geologists believe that this structure is entirely located within the territories of Iraqi, in addition it is located in a high hydrocarbon potential areas and the clouser may reach up to (800) m.

The location of the first exploration well Zurbatiya -1 was identified in 1980, yet not started due to Iraq-Iran war.

The estimated OOIP in the Tertiary and Cretaceous reservoirs is around 8,800 million barrels.

The produced oil will be transported to Badra DGS, and then evacuated via Badra export pipeline.

| ZURBATIYA | |
|-----------|--------|
| ZONE-38 | |
| N | E |
| 3707999 | 581765 |
| 3683701 | 592500 |
| 3672617 | 585910 |
| 3666736 | 598315 |
| 3684740 | 593474 |



Shihabi Block

This block is located within Missan and Wasit provinces which include Shahabi structure No. (121).

It was surveyed in 1975 through a seismic survey program for Ali Al-Gharbi area, then during the period 1978 to 1983 it was surveyed again by Iraqi seismic crew.

The results of 1983 seismic survey as well as the study which was conducted in 1995 showed that there is a major regional syncline within the territory of Iraq in addition to new structure which runs parallel to the Iraqi-Iranian border.

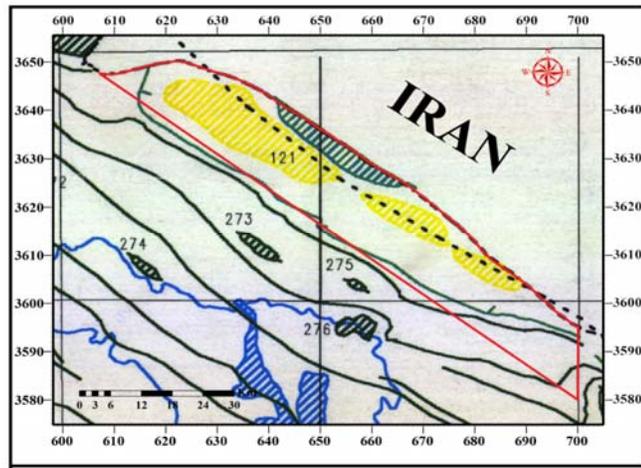
The length of Shihabi structure within Iraqi territories is about 32 km and its width is between (1.3-5) km.

Al-Shihabi structure is located in the area of high hydrocarbon possibility zone for both Triassic and Cretaceous formations.

The beginning of Iraq-Iran war has obstructed the drilling of the exploration well.

The produced oil will be transported via (70) km new pipeline to Abu Ghirab North DGS, then evacuated via Halfaya-Buzurgan-FAO pipeline.

| | |
|---------|--------|
| SHIHABI | |
| ZONE-38 | |
| N | E |
| 4647800 | 607500 |
| 3580000 | 700000 |
| 3594380 | 700000 |



Huwaiza Block

It is located in Missan province, and include Huwaiza field and south Huwaiza structure.

The axis of Huwaiza field No. (295) is (North-North east), its length is around 17 km with a width of 8 km.

The dimensions of South Huwaiza No. (319) according to Nahr Umr reflector is about 9 km long and 5 km wide.

The first exploration well Huwaiza-1 was drilled in 1980 in which was proved the presence of oil in Khasib and Nahr Umar formations from Tests and well logs results. The well logs also indicated the presence of oil in Hartha, Sadi and Mishrif formations.

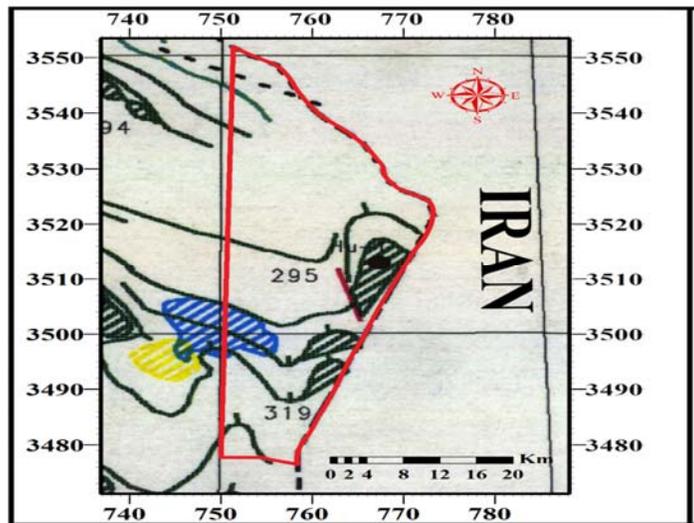
The resent study which was conducted in 2005 prove the existence of a very good and high-pressure oil shows in Zubair formation.

The estimated OOIP is around 2,400 million barrels.

The produced Oil will be transported via (60) km pipeline to Halfaya DGS.

The produced gas will be trated with the Halfaya Gas plant.

| HUWAIZA | |
|---------|--------|
| ZONE-38 | |
| N | E |
| 3551952 | 751334 |
| 3477233 | 758466 |
| 3477750 | 750000 |



Sindbad Block

It is located in Basra province within the high hydrocarbon potential region (Cretaceous).

This block includes Sindbad field No. (344).

The first exploration well Sindbad -1 was drilled in 1974 and reached a depth of 2,685 m Mishrif formation.

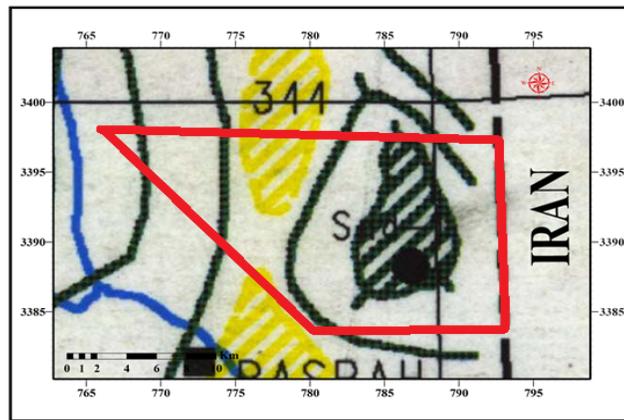
The test results of this well did not show the presence of hydrocarbon accumulations in the Mishrif formation, but there is a potential within the deeper formations such as Zubair and Yamama.

Sinbad-2 well was drilled on 21 September 2013 and reached the depth of 4,371m (Sulay formation). The drilling results showed good hydrocarbon accumulations in Yamama formation.

The estimated OOIP is about (2,150) million barrels.

The produced oil will be evacuated by (55) km new pipeline to Nahr Umr Depot.

| SINDBAD | |
|---------|--------|
| ZONE-38 | |
| N | E |
| 3397434 | 792634 |
| 3383864 | 793115 |
| 3383776 | 780157 |
| 3398075 | 765957 |
| 3397380 | 790286 |



FAO Block

It is Located in Basra province near the border Iraqi-Kuwaiti-Iranian borders.

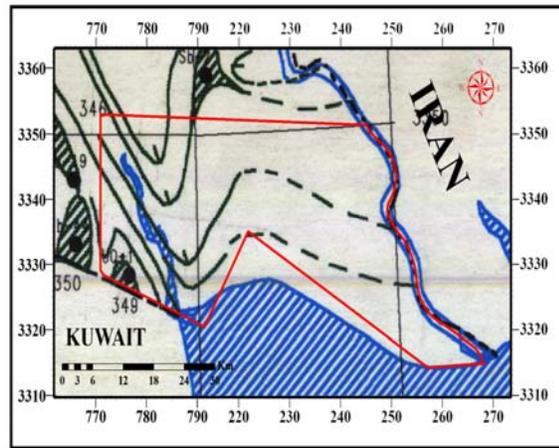
This block is situated within an area known by its high oil potential in the southeastern part of Iraq, Zubair field to the west, Ben Umr and Siba fields to north and and north east.

Umm Qasr structure No. (349) which is located 12 km to the east of Safwan city.

The first exploration well Um Qasr-1 was drilled in 1978 to explore the hydrocarbon potentials of Mishrif, Mauddud, Nahr Umr and Zubair formations. Even the drilling results, well logs did not prove the presence of hydrocarbon, still this area is considered as a high potential area.

According to the study conducted by Oil Exploration Company in 2016, indicated the possibility of high hydrocarbon presence in Mishrif and Zubair formations, especially to the western and northern part of the Fao Peninsula.

| FAO | | |
|---------|---------|--------|
| ZONE | N | E |
| | 3353000 | 771000 |
| ZONE-38 | 3327401 | 771754 |
| | 3322480 | 783184 |
| ZONE-39 | 3334426 | 221817 |
| | 3311894 | 256009 |
| | 3312571 | 269142 |
| | 3349654 | 247106 |



Jebal Sanam Block

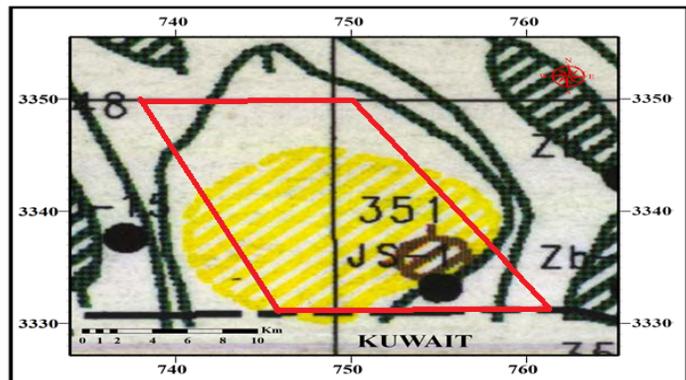
Located in Basra province which include Jebal Sanam structure No. (351).

Jebal Sanam is located 8 km west of Safwan, and its length in Iraq is about 5 km.

The first exploration well Sanam-1 was drilled in 1978. The results of the drilling, DST and logs showed the existence of residual oil in Ahmadi, Mishrif, Mauddud, Nahr Umr, Shu'aiba and Zubair formations.

The produced oil will be evacuated via (35) km new pipelin to Zubair-1 Depot.

| JEBAL SANAM(JS) | |
|-----------------|--------|
| ZONE-38 | |
| N | E |
| 3331297 | 761319 |
| 3331032 | 745775 |
| 3349741 | 738072 |
| 3349947 | 750022 |



Khider Mai Block

It is located in Basra and Al-Muthana provinces.

This block include several fields and structural anomalies:

- No. (352) Dubduba.
- No. (354) Rachi Field.
- No. (360) South Rachi.
- No. (361) Jraishan field.
- No. (367) Batin.
- No. (369) Khider Mai field.
- No. (370) South Khider Mai.

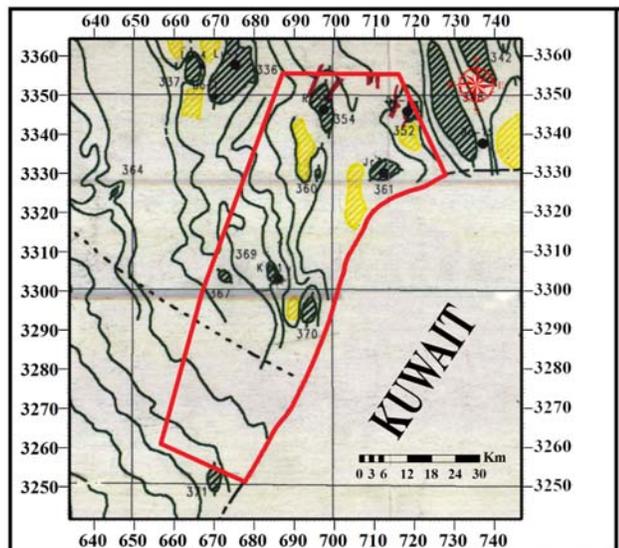
Khider Mai Field is an anticline, located (80) km to the southwest of Rumaila field.

The first exploration well KM-1 was drilled in 1980, both the drilling and logs results indicated the presence of oil evidences in Yamama formation, and good gas and oil or probably very light oil accumulation in Najmah formation.

The major reservoirs in this block are (Mishrif, Nahr Umr and Zubair).

The produced oil will be evacuated via (65) km new pipeline to Zubair-2 Depot.

| KHIDER MAI(KI) | |
|----------------|--------|
| ZONE-38 | |
| N | E |
| 3355340 | 716019 |
| 3355519 | 687107 |
| 3300014 | 667118 |
| 3260973 | 656672 |
| 3250735 | 676567 |
| 3328993 | 728929 |



Rachi Field

It is located 80 km to the west and south-west of Basra city, and 36 km to the southwest of Ratawi field.

Field dimensions: length is (16) km and width is (5) km.

The first exploration well Rachi-1 was drilled in 1956 and the second well Rachi-2 was drilled in 1976.

Oil API: 28, 31.9, 39 for Nahr Umr, Zubair and Yamama reservoirs respectively.

Initial Oil in Place:

Oil (million barrels): proven (420) and possible (740).

Gas (billion cubic feet): proven (64.7) and possible (238.7).

Jeraishan Field

It is located 23 km to the south-east of Rachi field, and 25 km to the south-west of South Rumaila Field.

Field Dimensions: length is (12.5) km and width is (9) km.

Only one exploration well has been drilled in this field.

Oil API: 19.

Initial Oil in Place (million barrels): proven (24.5) and possible (70).

Arabian Gulf Block

It is Located in the regional Iraqi Gulf area.

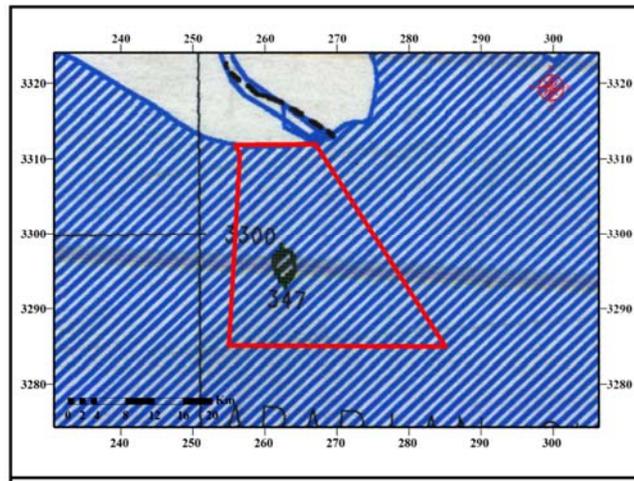
Area of the block is around 400 km².

Hydrocarbon Potential: Oil – Mesozoic Era.

From Iraqi studies we have initially recognized the first anomaly with a number (347) and called (The Gulf).

The produced oil will be evacuated to FAO Depot.

| ARABIAN GULF | |
|--------------|--------|
| ZONE-39 | |
| N | E |
| 3311889 | 255897 |
| 3311964 | 267014 |
| 3284939 | 285043 |
| 3285071 | 254995 |
| 3310603 | 256523 |





About Iraq Energy Institute

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