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# **Iraq: Rebuilding the Oil Export System**



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**A Research Paper**

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May 1986*

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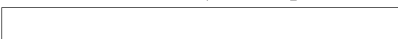
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# **Iraq: Rebuilding the Oil Export System**



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**A Research Paper**

This paper was prepared by  Office  
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May 1986*



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**Iraq: Rebuilding the  
Oil Export System** 

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**Summary**

*Information available  
as of 1 April 1986  
was used in this report.*

Iraq is steadily rebuilding its capabilities to export more oil to help overcome problems created by the continuing war with Iran, the loss of key Persian Gulf oil export facilities, and the need to offset falling oil prices. The program reflects Iraq's shift in emphasis from postwar reconstruction plans to preparations for continuation of a protracted war with Iran. It concentrates on projects that can generate revenue most quickly, using countertrade and other arrangements to minimize actual cash outlays, especially in the near term. Key elements of the strategy are:

- New pipelines to expand oil exports and permit more secure export routes and more flexible oil operations.
- Additional production capacity to replace oil and gas production capabilities lost because of the war.
- Continued exploration to maintain reserve levels.
- Limited new downstream petroleum activities to meet immediate refining and gas needs.

The cornerstone of Baghdad's plan is a series of crude oil pipeline projects designed to provide secure export outlets on the Mediterranean and Red Seas. Expansion of the capacity of the Iraq-Turkey line in 1984 and completion of a pipeline link to Saudi Arabia's East-West pipeline to Yanbu al Bahr in 1985 have already more than doubled Iraq's export capacity from that in the early years of the war. This export capacity, however, is only 30 percent of its prewar level. The Iraqis also have greatly increased the trucking of crude and product exports through Jordan and Turkey.

The oil price decline this year is forcing some adjustments but will not derail Baghdad's plans to rebuild the export system. Oil exports are Baghdad's financial lifeline and the expansion program is vital if Iraq is to have any chance of outlasting Iran in the war. Petroleum equipment and services companies are facing a slack market and are likely to be accommodating to a variety of financing arrangements offered by Iraq. Baghdad is likely to deal with the impact of falling prices largely by cutting imports of some consumer goods and industrial goods and services not tied to the oil program. There will be some pressure, however, to postpone maintenance and keep low inventories of spare parts, both of which would have longer term effects. As a result, we expect some operational problems to develop as equipment in older fields breaks down, and repairs are put off.

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Iraq's recent military setbacks at Al Faw in the south and east of Karkuk in the north have not yet forced Iraq to alter its rebuilding program. The southern Iraqi portions of export pipeline projects are nearly complete, but they are only 50 kilometers from the fighting; the northern export pipeline project is far from the war zone. Because revenues from these projects are critical to Iraq's war effort, Baghdad will continue to push them even if they are endangered by the fighting. As the contribution of these facilitates to Iraq's financial position grows—or if Iraq's campaign against oil export targets in Iran escalates—Tehran will be inclined to shift its tactics to specifically target them. In both areas, Iraq has taken exceptional measures to fortify and defend oil facilities, making another disruptive Iranian attack difficult to carry out. Moreover, well-defended population centers would have to fall before most of the facilities could be captured.

If serious war damage or disruption can be avoided, completion of Baghdad's rebuilding program would renew the flexibility of Iraq's export system and give Baghdad the capability to export crude at near prewar levels by 1990:

- In 1984 exports were increased by about 300,000 barrels per day (b/d) to more than 1 million b/d through the Turkish line—the primary Iraqi export route after the loss of Persian Gulf outlets in 1980 and the closing of the Iraq-Syria pipeline in 1982.
- In 1985 exports began through the 500,000-b/d pipeline link to Saudi Arabia's Red Sea port at Yanbu al Bahr.
- In 1987 Turkish pipeline capacity will reach 1.5 million b/d with completion of a 500,000-b/d expansion.
- By 1990, upon completion of the second phase of the Iraqi-Saudi pipeline, capacity of Red Sea outlets will be 1.6 million b/d and total Iraqi oil export capacity will be more than 3 million b/d. Temporary facilities may even allow Baghdad to approach these levels by mid-1987.

Much of Iraq's ambitious program is hostage to Saudi willingness to provide access to the Red Sea. Although the Saudis have stretched out some project activities with delayed decisions, we believe the large Saudi stake in Iraq's efforts to stop the spread of Tehran's Islamic fundamentalism will make Riyadh generally accommodating on these issues.

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Despite the uncertain environment, Baghdad's new oil program is creating major opportunities for Western oil equipment, service, and construction companies. In fact, Iraq may be one of the larger foreign markets for petroleum development services and equipment over the balance of the 1980s. We expect more than \$3 billion in new projects to be started under the revised program, mostly on a barter basis. Western gains will largely be at the expense of the Soviets—who have been a major foreign actor in Iraq's oil industry—because they lack the sophisticated instrumentation technology in which Iraq is interested. Although we expect US companies to participate in some new projects, especially in technology-dominated exploration work, we believe West European firms—with solid technology, lower costs, and low government financing—are likely to get the large drilling and construction contracts.



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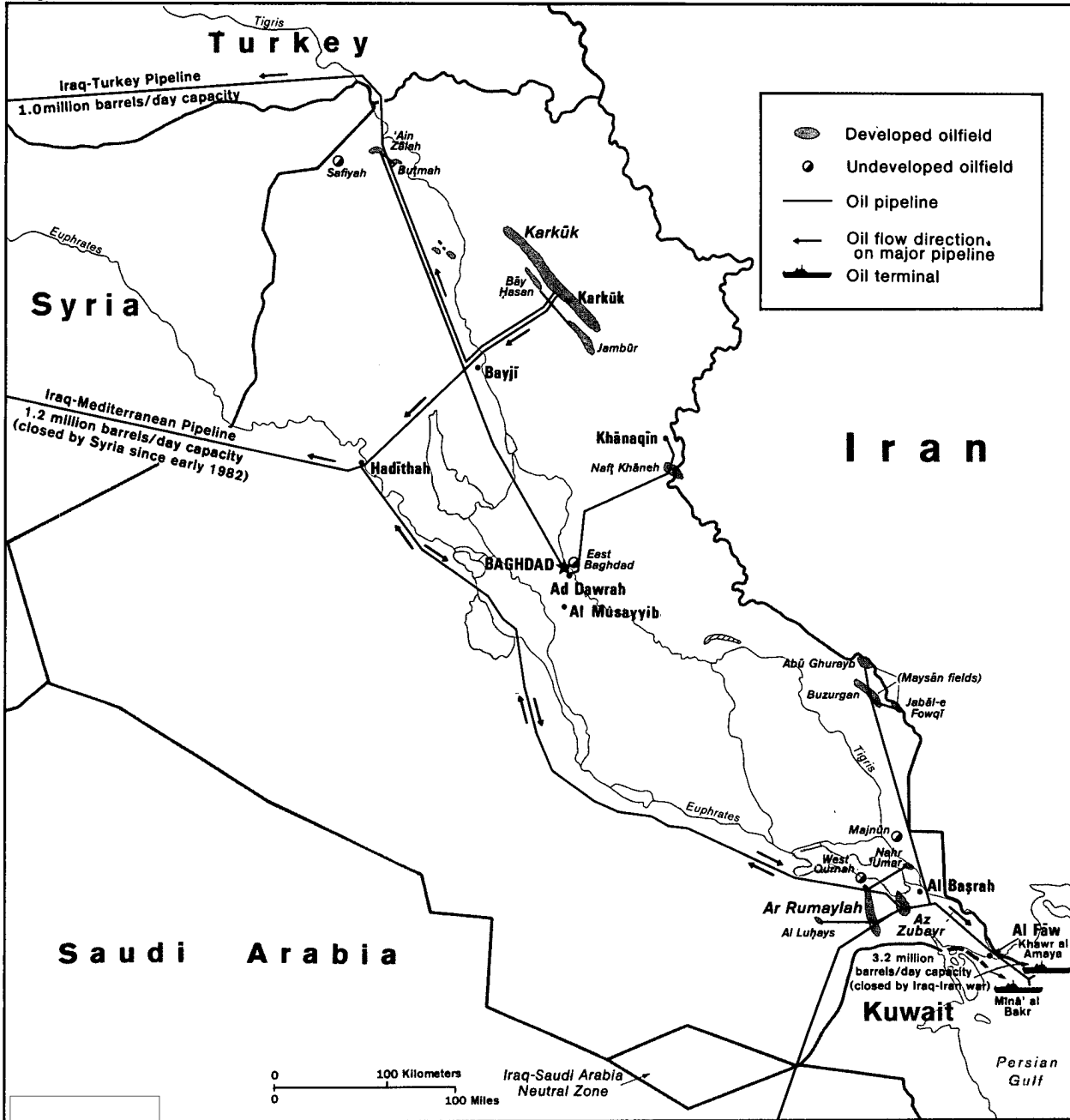
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Figure 1  
Major Iraqi Oilfields and Installations



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## Iraq: Rebuilding the Oil Export System

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### Introduction

Iraq had one of the most sophisticated and well-developed oil production, distribution, and export systems in the Persian Gulf when the Iran-Iraq war broke out in 1980 (figure 1). Plans had been completed to raise crude production capacity from about 3.7 million barrels per day (b/d) to more than 6 million b/d by 1990, and large-scale development of natural gas resources was under way. Because of redundancies built into the system, export facilities had the capacity to handle up to 5 million b/d of crude.

The war with Iran has caused much disruption to this system, and plans have been dramatically changed. In the first year of the war, the delivery system was substantially damaged, oilfield facilities were attacked, and most long-term development plans were put on hold. As the war has persisted, Baghdad has had to redirect its oil development strategy and focus on ways to adapt to the wartime environment, especially to raise oil export earnings to finance the war.

This paper assesses Baghdad's response to the impact of the war on the country's oil sector, including efforts to rebuild the oil export system and redirect export oil flows to more secure routes. It also looks at Iraq's present oil exploration and oilfield development program, the foreign role in the oil industry, prospects for Iraq's oil development plans, and the contribution of the new oil program to the war effort.

### War Damage and the Oil Revenue Problem

During the first year of fighting, major portions of the Iraqi oil system were damaged, destroyed, or taken out of operation. The most significant damage was to oil export systems, especially the loading facilities located in the Persian Gulf. Some oilfield production facilities also were substantially damaged. Moreover,

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### The Prewar Oil Program

*In early 1980, Baghdad began implementing a massive oilfield development program to solidify a leadership role within OPEC. Key features of the plan included:*

- *Raising sustainable oil productive capacity to more than 6 million b/d by developing five major southern oilfields.*
- *Using Brazilian, French, Italian, East European, and Soviet companies to provide technical services in the development program.*
- *Resolving technical problems at Karkuk and Ar Rumaylah oilfields to prevent a drop in existing oil production levels while moving to discover new fields.*
- *Promoting two large-scale natural gas development projects in the northern and southern parts of the country. These gas delivery networks were to provide energy to domestic users and to avert wasteful flaring of large volumes of oil-associated gas.*

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as the fighting continued, the war itself put a hold on oil sector development projects that were put in motion as part of Iraq's 1980 long-term oil program.

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### Export Facilities Destroyed or Closed

Baghdad lost nearly two-thirds of its export capacity—some 3.2 million b/d—when its offshore Persian Gulf oil terminals at Khawr al Amaya and Mina al Bakr, both fed from onshore facilities at Al Faw, were heavily damaged during air and naval commando

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**Iran: War Damage and the Need To Establish New Oil Export Outlets**

*In its efforts to restrict Iran's oil revenues, Iraq has attacked Iranian production and export facilities. The Iraqi air campaign against the Iranian oil facilities has had a negligible effect on production facilities, and, of nearly 100 attacks on Khark Island, only a handful have caused sufficient damage to even temporarily halt exports. An attack on 15 August 1985 and a subsequent attack on 19 September 1985 inflicted substantial damage to the loading terminals at Khark. In each instance, however, alterations in loading procedures or repairs to equipment limited interruptions to exports to only a few days. An Iraqi air attack at the onshore Ganaveh control manifold in late January caused the most significant disruption to oil exports from Khark since the war began, but normal flow rates were restored after 16 days. Since the war began, Khark Island's export capacity has dropped from 9 million b/d to 4 million b/d as a result of the cumulative damages from Iraqi attacks. The reduced capacity, nevertheless, is still more than enough to support present Iranian exports of around 1.5 million b/d. [redacted]*

*The Iraqi attacks have raised Tehran's concerns over the risk of a prolonged cutoff of exports from Khark. Tehran has responded by planning increased redundancy and flexibility through expanded oil operations.<sup>a</sup> Activities planned or under way include projects to increase both storage and tanker loader capabilities:*

- *Installation of three single point mooring buoys off the coast of Ganaveh, east of Khark, should be complete by early summer, adding nearly 2 million b/d to export capacity.*

- *Proposed new pipelines to deliver oil to new export facilities at Taheri under consideration could increase export capacity by nearly 2 million b/d within two years.*
- *Purchases of additional storage tankers for the shuttle operation will enable Tehran to export more crude, or to sustain exports at current levels in the event of an extended disruption to Khark or Ganaveh.*
- *Further repairs to Khark Island loading facilities might be planned. [redacted]*

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*These projects could raise the total capacity of Iran's export facilities to about 7 to 8 million b/d—well above the current export level of about 1.5 million b/d and the capacity of Iran's oil production facilities, which we estimate at about 3.2 million b/d. Iran, however, is also planning measures to boost its production capacity, which has eroded from more than 6 million b/d since the revolution. Iran, for example, is discussing possible plans to revive the gas injection project at the Gach Saran oilfield, which would significantly boost oil production there. [redacted]*

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*Proposed production increases would give Tehran the option to at least double its current export levels in just over a year. Moreover, the completion of new export facilities will make it less likely that Iraq can force Iran to the bargaining table by reducing oil revenues and contributing to internal pressures arising from economic discontent. [redacted]*

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[redacted]

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attacks in the early months of the war. [redacted] before operations can be resumed, the Khawr al Amaya facility will have to be completely rebuilt and the Mina al Bakr terminal will require major restoration (figure 2). [redacted]

In addition, Mediterranean exports were cut. Iranian air raids against the Karkuk Crude Processing Plant Number 1 in October 1980 were able to halt briefly more than 1.1 million b/d of Mediterranean exports through Iraq-Turkey and Iraq-Syria pipelines. Eventual closure of the Syrian line by Damascus in April 1982 limited Iraq's export capacity to about 700,000 b/d through Turkey, less than one-seventh of its prewar export capacity. [redacted]

**Crude Processing Limited**

Iraq's refineries took a hammering from Iranian jets in the early stages of the war. Iraq lost at least 90 percent of its more than 300,000-b/d refining capacity when Iraqi refineries in Al Basrah, Ad Dawrah, and Khanaqin were badly damaged. As a result, Iraq was compelled to import almost all of its oil products. The country's national gas gathering program—designed by Snamprogetti in the 1970s for startup in 1982 to make economic use of flared gas—also suffered as a result of the war. Although northern portions of the gas project involving Jambur, Karkuk, and Bay Hasan oilfields were commissioned in March 1984—two years behind schedule—the southern portion, primarily intended for the export of gas as LPG, continues to be delayed by the war, [redacted]

**Oilfield Losses**

Most of the important producing fields near the Iranian border in the southern region—such as Abu Ghurayb, Buzurgan, and Jabal-e Fowqi—have been shut in since early in the war. Iran also controls a portion of the giant southern Majnun oilfield and all of the Naft Khaneh production facilities as a result of military operations begun in March 1984. We estimate that total shut-in southern capacity is probably more than 50 percent of a prewar regional capacity of slightly more than 2 million b/d. [redacted]

**The Oil Revenue Pinch**

During the first several years of the war, Baghdad's unwillingness to curtail its ambitious development program, combined with large military expenditures

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***Iraq's Major Oil Customers***

*Iran's destruction of Iraq's Persian Gulf oil export terminals forced Baghdad to develop new oil trade patterns. In 1980 some 90 percent of Iraq's 2.5 million b/d of oil exports was shipped through the Strait of Hormuz, with 15 percent going to Asian customers, about 15 percent to the Americas, and 60 percent to European and African purchasers. The remaining 10 percent of Iraqi exports found its way to market through several Mediterranean ports. In 1985, however, nearly all of Iraq's crude exports—about 1 million b/d—flowed through the Mediterranean Sea port of Ceyhan. This dislocation of export operations caused Asian customers to switch to other suppliers to save on transportation costs and forced Baghdad to find new customers. European purchases increased to about 75 percent of Iraq's oil sales and the share going to the Americas rose to nearly 20 percent. Only after Iraq began exporting from the Saudi Red Sea terminal at Yanbu in late 1985 was it able to regain a direct foothold in the Asian market. Although exports to Asia from Yanbu were minuscule in 1985, the Iraqis are hoping to sell some 20 percent of their exports to the Japanese in 1986, according to industry press reports. [redacted]*

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and the loss of oil revenues, reduced Iraq's foreign exchange reserves from an estimated \$35 billion to an estimated \$3 billion in 1983. According to our estimates, the loss of oil flows from Iraq's Persian Gulf export terminals alone cost Baghdad about \$19 billion in hard currency revenues in the first year of the war. Financial aid from Iraq's Gulf neighbors—estimated to have totaled \$30 billion between 1980 and 1983—could not be sustained at those high levels, especially as the oil market weakened. The continuing war and dwindling aid forced Baghdad to assume a greater financial burden and take a longer term view of its war effort. The financial pinch also led to moves to escalate the war against Tehran by attacking Khark Island and Ganaveh export facilities in an effort to increase economic pressure on Iran and force a settlement of the war. [redacted]

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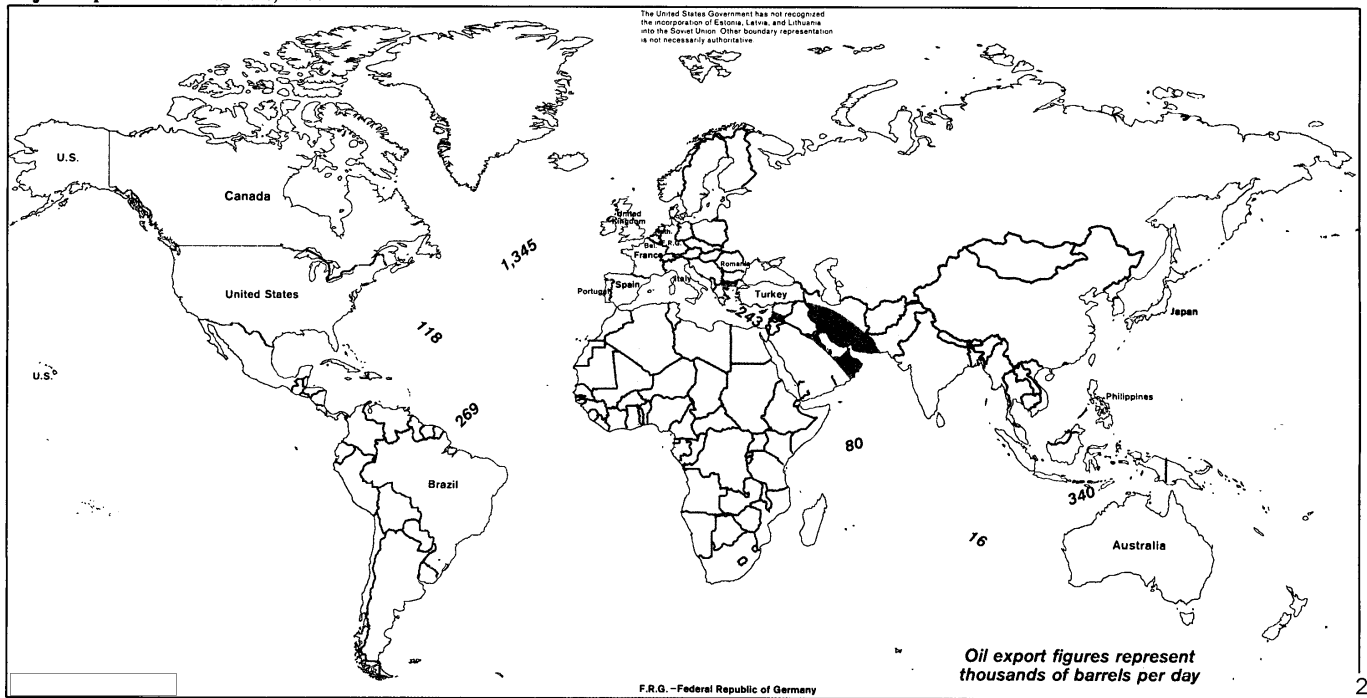
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**Figure 3**  
**Major Iraqi Oil Trade Partners, 1980**



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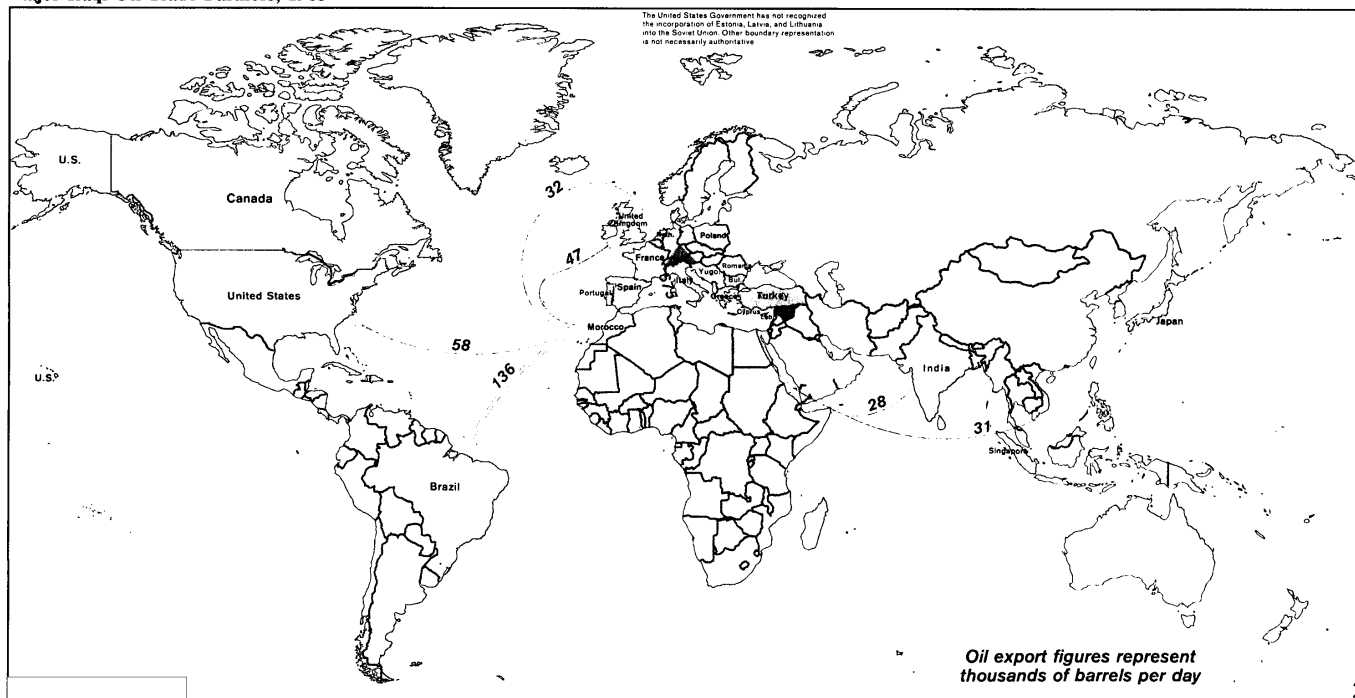
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**Figure 4**  
**Major Iraqi Oil Trade Partners, 1985**



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**The Rebuilding Program**

Iraq's oil export capacity was reduced by more than 85 percent by early war damage to Gulf loading facilities and the closing of the Syrian line to the Mediterranean by Damascus in April 1982. Until recently, the only export systems available were the Iraq-Turkey pipeline and a fleet of tanker trucks hauling limited quantities of crude and products through Turkey and Jordan. A proposed pipeline through Jordan has been long discussed, but it has little momentum. Several other pipeline projects, however, are under way or planned that could virtually eliminate Iraq's need for a Persian Gulf outlet and enable Iraq to export crude at near prewar levels.

[Redacted]

**Creating Export Routes**

***Iraqi-Saudi Pipelines.*** The key to Iraq's rebuilding strategy is the construction of export pipelines through Saudi Arabia to an export terminal on the Red Sea. The 500,000-b/d, 48-inch, first phase of the Iraqi-Saudi pipeline, IPSA I, connects southern Iraq's Az Zubayr and Ar Rumaylah oilfields with the Saudi East-West pipeline at pump station 3 (figure 5). Here Iraqi crude is stored in two 1-million-barrel tanks before being shipped in batches of up to 2 million barrels of oil to the Red Sea port of Yanbu al Bahr (Yanbu). Iraq's Red Sea exports have averaged about 350,000 b/d since the line became operational in September 1985. Aramco is responsible for the operation of the line and has established the Iraqi Pipeline Department within the company to handle this responsibility, [Redacted]

[Redacted]

IPSA I is only a temporary arrangement until the second phase of the project, IPSA II, is constructed. The second phase—officially approved by the Saudis in February with construction scheduled to start by

December—calls for a 56-inch line parallel to the East-West pipeline from pump station 3 to a new port 20 kilometers (km) south of Yanbu. [Redacted]

[Redacted]

***Iraq-Turkey Pipeline.*** In early 1984, Baghdad increased exports through the Iraq-Turkey pipeline—its sole outlet at the time—by some 30 percent from a rated level of about 700,000 b/d by using flow enhancing chemicals. In late 1984, work was completed enlarging the line's rated capacity without flow enhancement to 1 million b/d. This expansion project included the construction of five new pump stations and sections of pipe parallel to the existing line. In October 1985, Iraq and Turkey awarded contracts to Italian and Turkish companies for additional expansion of the line. [Redacted]

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**Figure 5  
New Iraqi Export Pipeline Projects**



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### Developing New Oilfields

Early in the war, fighting in the south and the closure of the Syrian export line forced Iraq to rely almost entirely on the northern Karkuk oilfield and its existing export pipeline link to the Mediterranean through Turkey. Although recent completion of IPSA I has helped relieve Iraq's reliance on Karkuk by expanding production of export crude in the Az Zubayr oilfield, Baghdad is proceeding with the development of several oilfields to ensure the availability of crude for an expanded export system and increasing domestic needs:

- Plans call for the *East Baghdad* field to begin producing at a rate of 30,000 b/d by 1988, according to US Embassy reporting. An ultimate production capacity of 200,000 b/d is planned, although [redacted] delineation of the reservoir, which lies in a complex geological structure, has not been completed. Snamprogetti of Italy won the contract for initial development. The oilfield's heavy crude initially will go to the Ad Dawrah refinery near Baghdad, but a pipeline joining the field to the Iraq-Turkey pipeline is under consideration.
- The *Safiyah* oilfield straddles the Syrian border in northwestern Iraq. Half of the field, 30 km long and 10 km wide, is on the Iraqi side, [redacted] only 140 million barrels of the field's estimated 818 million barrels of reserves are located in Iraq. The oilfield was discovered in Syria in 1959 and has been extensively produced by Syria since 1968. Development has been assigned a high priority to counter Syrian depletion of the field. Iraq plans to drill 35 to 40 production wells and to begin producing the field at a rate of 30,000 b/d by 1987, [redacted]
- With Soviet assistance, the *West Qurnah* oilfield is in the initial stages of development and is estimated to have potential reserves of almost 5.2 billion barrels of oil. [redacted] delineation

and development of this southern oilfield, located near the operating Ar Rumaylah oilfield, will require construction of dams and roads in marshland. The field is well placed to support either expanded exports through the Iraqi-Saudi line to the Red Sea or increased domestic refinery operations. Production is targeted to begin at 50,000 b/d by 1988. On the basis of available information on the development scheme, however, we believe that the reservoir will be developed to support a substantially higher oil production plateau, possibly in excess of 300,000 b/d. Also, substantial associated gas will be used domestically. The field also will provide feed gas to the Al Musayyib 1,200-megawatt power plant some 500 km to the north near Baghdad. [redacted]

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All three projects are under way, and we believe development of these oilfields is likely to increase Iraq's productive capacity by about 300,000 b/d, or to more than 3.5 million b/d by 1990 (figure 6). [redacted]

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### Exploring for More Oil

The long-term health of the reinvigorated Iraqi oil system requires continued replacement of oil reserves through exploration. Revenue shortages, and the war itself, have forced Baghdad to cut back exploration efforts and to move oil prospecting activities into areas away from the fighting, according to press reporting. Iraqi Deputy Oil Minister Chalabi told US diplomats that Baghdad's oil development program will keep only eight seismic crews busy, down from a prewar level of 22 crews. Other exploration activities involving foreign firms are planned during the next several years:

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- Seismic surveys will be conducted by Japanese crews over about 40,000 square km in *Northwest Iraq* and another 150,000 square km in the *Southwest*. The survey program, which will require three years to complete, includes reprocessing seismic data already in the Oil Ministry's possession.

- Exploration activities in Iraq's *Western Desert* are planned by Royal Dutch Shell and the Japanese National Oil Company, [redacted]

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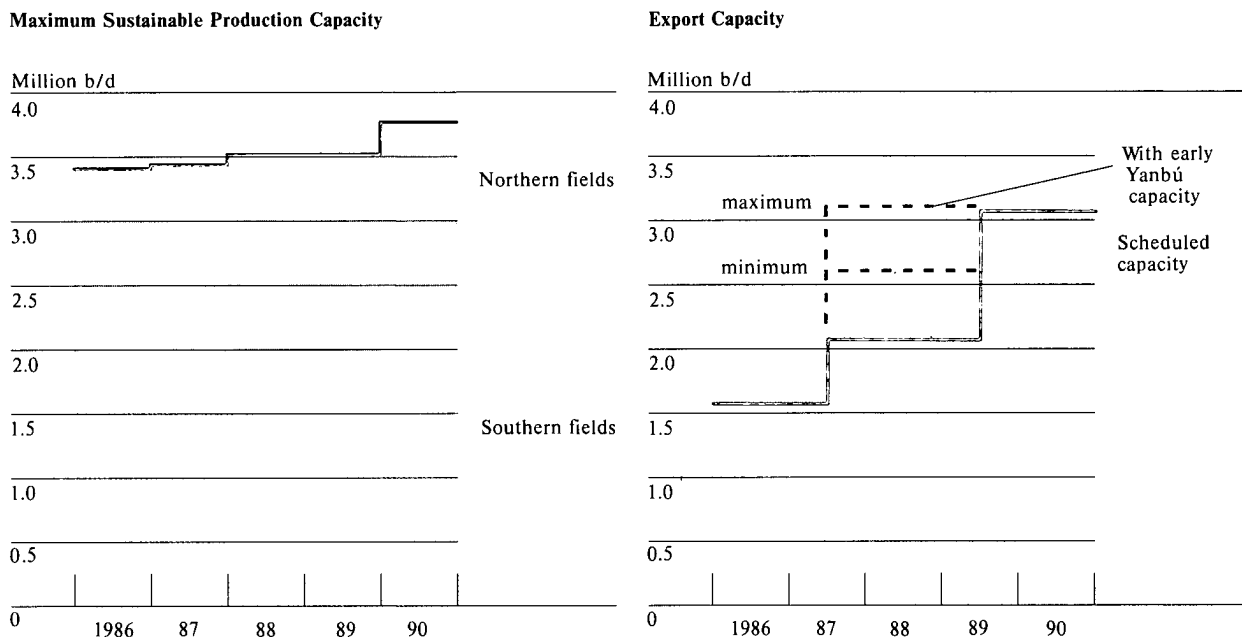
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**Figure 6**  
**Iraq: Projected Production and**  
**Export Capacity Increases, 1986-90**



[Redacted]

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- Exploratory drilling at *West Baghdad* well sites—selected on the basis of the reevaluation and re-interpretation of the oilfield seismic data by a US oil company—is nearly complete, [Redacted]

**Developing Downstream Facilities**

Operation of Iraq's refining facilities is gradually returning to normal after suffering war damage and delays since early in the war. Damage to the refineries at Al Basrah and Ad Dawrah cut refining capacity below domestic demand for petroleum products. Domestic consumption in 1981, for example, was about 210,000 b/d, compared with product production of only 190,000 b/d. Iraq was forced to import oil products until expansion of the Bayji refinery was completed by a Czechoslovak/Japanese consortium in

early 1982. Since then, Iraq not only has been able to meet domestic demand but has also exported products at rates [Redacted] as high as 100,000 b/d. Moreover, Iraqi oil officials say development plans include expanding existing refinery capacity and building a new grassroots 150,000-b/d domestic refinery at al Hindiyah, according to the US Embassy. [Redacted]

Budget constraints have knocked most of Baghdad's ambitious gas development plans off track. Iraq has been promoting two large-scale natural gas development projects in the northern and southern parts of the country since early 1978. Although delayed more

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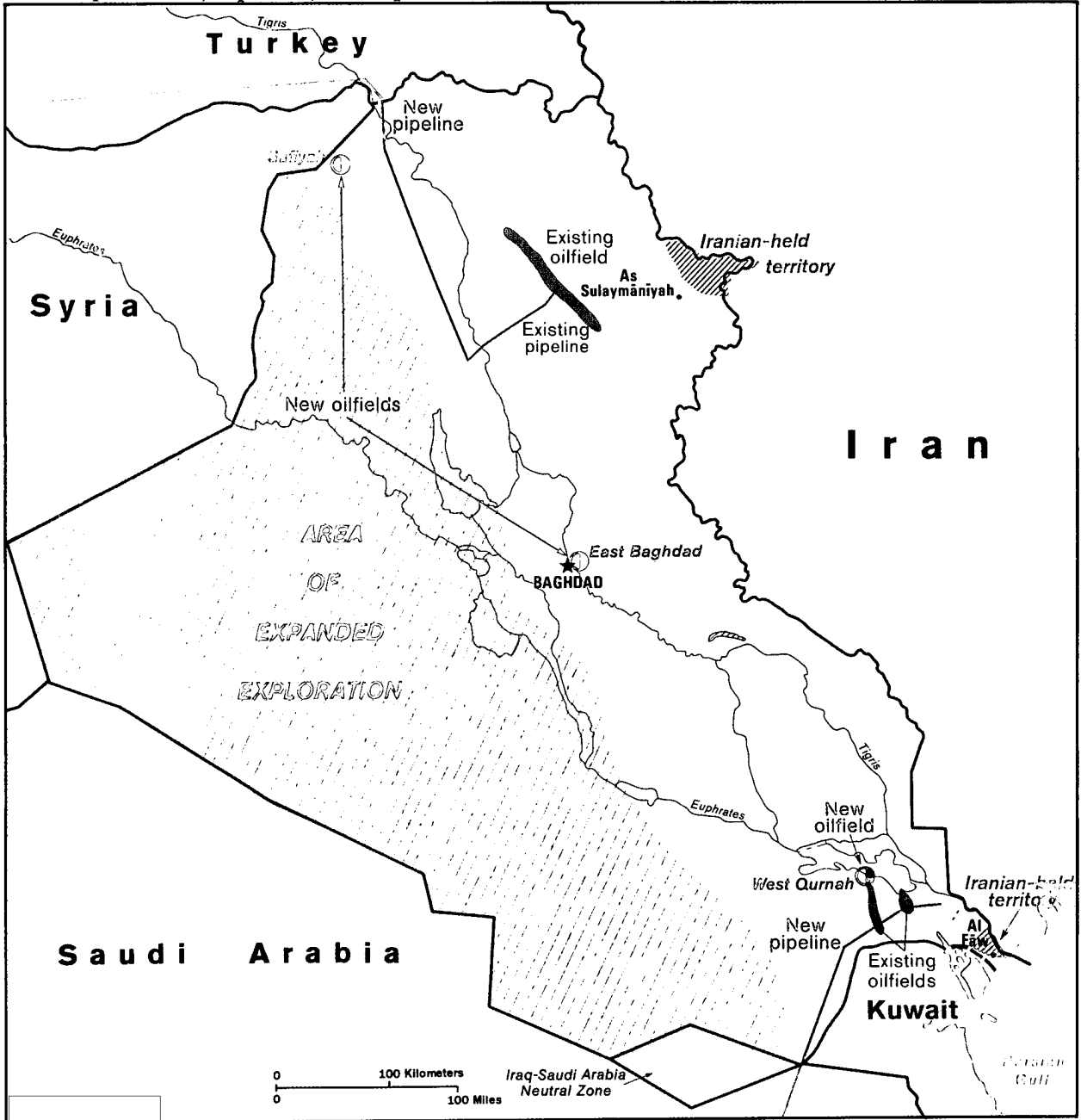
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**Figure 7**  
**New Iraqi Oilfields, Pipelines, and Exploration Areas**



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than a year because hard currency was diverted to support the war effort, the northern gas processing plant and natural gas treatment center are operational. [redacted] The continuing war, however, has prevented completion of the southern portion of the gas program including construction of the 190-billion-cubic-foot-per-year Ar Ratawi NGL/LPG fractionator northwest of Al Basrah, which will use West Qurnah feed gas. [redacted]

Meanwhile, domestic gas requirements are expanding—such as the need for feedstock for the Al Musayyib power station now under construction—and regional shortages could occur. To date, gas availability has depended on oil production because Iraqi law allows only associated gas to be produced. As a result of the oil production constraints caused by the war, Iraq has decided to change this law and promote development of certain northern gasfields, according to US Embassy reporting. Additionally, Baghdad plans to build a gas treatment plant at Karkuk, and an 800-km reversible flow pipeline to transport natural gas liquids to southern fields and to supply some 18 power stations and cement plants along the way. This will enable Iraq to send 400 million cubic feet per year of southern gas to Kuwait—through a pipeline now under construction—and still meet domestic demand. [redacted]

**Financing the Program**

Even with the priority given to rebuilding the export system, funds are clearly limited. Program spending for the Iraqi oil industry is now under constant review, [redacted] and funds are allocated strictly on an annual basis with oil development plans adjusted as needed. Even top priority projects—creating new export outlets—are subject to delays based upon changing financial constraints. Project payments—rarely made in cash as in prewar years—often involve either two-year payment deferrals, payments in crude oil and supplier credits, or countertrade crude oil deals, according to US Embassy reporting. Indeed, before the war Iraq was considered quite unsophisticated in arranging international financial packages, but, [redacted] it is now considered very skillful in arranging complex financial deals to keep projects moving with limited funds. [redacted]

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**Cost Cutting on the Iraqi-Saudi Spur Pipeline**

*The Iraqis have proved to be tough bargainers on project costs, as they demonstrated in negotiating work on their most important recent project—the Iraqi-Saudi spur line. In spite of the high priority attached to building a pipeline that restored a capability to export from its blocked southern oilfields and despite pressing its case with the Saudis for several years, Iraq delayed awarding pipeline construction contracts at the last minute until costs were revised downward and financing plans were resubmitted.* [redacted]

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*Startup of the Iraqi-Saudi line on 19 September 1985 culminated more than four years of effort by Iraq to expand its oil export outlets at the lowest attainable price.* [redacted]

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[redacted] *Another 15 months was spent overcoming numerous political and technical problems—including questions of ownership and procedures for storing and shipping Iraqi crude through the Saudi East-West line—before a design contract was awarded in March 1984.* [redacted]

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*Construction bidding was closed on 11 August 1984, but the Iraqis' dissatisfaction with the project costs, reportedly more than \$700 million, caused them to further delay the project and led to a second call for bids by mid-September 1984. Finally, in October 1984 construction began on the project at the reduced price of \$508 million, 30 percent below the initial price proposal. Iraq paid construction costs through a combination of foreign credits, Iraqi dinars to cover local costs, and at least \$49 million worth of bartered oil used as a downpayment.* [redacted]

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Despite the recent sharp decline in oil prices, Iraq's oil rebuilding program will continue to receive strong financial support from the present regime. Nonetheless, Iraq already has delayed or canceled many projects that have high costs-to-earnings ratios or that require large quantities of manpower; the oil development projects currently under way or planned for the near term tend to be those that will increase Iraq's hard currency earnings outlook. Of the major projects under active consideration, only the financing of the second phase of the Iraqi-Saudi pipeline has yet to be arranged. In our opinion, this will not prevent the project from proceeding. Several contractors are well positioned to do the field construction work—some of which has already been completed in conjunction with a Saudi project—and other contractors are making strong bids to participate, according to US Embassy reporting. Indeed, we expect the Iraqis to drive a hard bargain during negotiations and to minimize costs—at the price of higher interest rates on the credit payments—as they have done successfully in the past.

The tight revenue situation will certainly force Baghdad to consider a number of adjustments. Given the weakness in the oil construction engineering and services market, we do not believe Iraq's previous—or likely future—rescheduling of contractor payments will prevent completion of ongoing projects. We believe, however, that Baghdad will choose instead to cut imports of some consumer and industrial goods not tied directly to the oil program if it is necessary to keep the export rebuilding effort moving ahead. Two aspects of the oil program are, however, vulnerable in our opinion: stocking the proper inventory levels of spare parts and regular maintenance of oilfield equipment. If Iraq cuts corners in these activities—such as stocking gaskets, seals, valves, wellheads or repairing metering instrumentation—increased equipment downtime could create serious problems that would degrade system performance over the next several years.

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### *The Soviet Role in Iraq's Petroleum Industry*

*The USSR has participated in oil projects in 25 countries, but Iraq has been by far the largest recipient of Soviet oil industry foreign aid. Moscow's entry into the Iraqi oil sector was helped in the 1960s by the increasingly radical policies of Baghdad, which began to press Western companies for more favorable participation and financial arrangements. According to press accounts, the USSR was on hand with financing, training, production, and marketing expertise when the Iraqis began nationalizing Western-owned assets. It also offered a market for Iraqi crude when traditional outlets were threatened by Western embargoes in retaliation for Iraq's expropriation of foreign-owned oil industry assets. Moscow's first big break into a major non-Bloc oil industry came in 1969 when Iraq accepted Soviet credits of \$120 million, after years of protracted Iraqi negotiations with Western partners on compensation issues.*

*Iraq has remained the centerpiece of Moscow's oil development foreign aid program, accounting for an estimated 40 percent of funding provided for this purpose. Our analysis indicates the \$1.2 billion Iraqi contract in 1983—which we estimate includes \$1 billion in credits—to develop the West Qurnah oilfield in southern Iraq was the largest of its type ever acquired by the USSR. It culminated more than 20 years of Soviet efforts to establish the USSR as the primary supplier of equipment and services for a major oil producer. Although the contract represented a major achievement for Moscow in an area where competition from the West is stiff, recent disagreements with Baghdad over financial and equipment issues have led the Soviets to seek bids from several Western firms to finish this project.*

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**Table 1**  
**Iraq: Soviet Extension of Credits and Grants**  
**for Hydrocarbon Development Projects**

Date Extended	Project	Amount Extended <sup>a</sup> (million US \$)	Amount Drawn (million US \$)	Status <sup>b</sup>
<b>Total</b>		<b>1,202.6</b>	<b>170.7</b>	
June 1969	Trade credit	54.0	45.0	
	Development—Halfayah			UC
	Exploration	17.9		UC
July 1969	Trade credit	66.7	66.7	
	Development			
	North Rumaylah	42.6		C
	Ratawi and Umar			C
	Al Lubais	7.0		C
	Pipeline, Rumaylah to Foo			C
April 1971	Line of credit	41.9	11.1	
	Oil refinery, Mosul	30.8		
	Pipeline, Northern Iraq			
	Pipeline, Baghdad-Basra	11.1		C
May 1976	Credit	40.0	37.9	
	Development—Rumaylah			
	Water injection equipment			UC
November 1983	Credit	1,000.00	10.0	S
	Development—West Qurnah Oilfield			

<sup>a</sup> Estimated.<sup>b</sup> S=Under survey

UC=Under construction or implemented

C=Completed

### Foreign Participation in the Oil Program

Iraq's ambitious rebuilding effort will require considerable involvement of foreign companies. Iraq, like other Middle East oil-producing countries, relies extensively on foreign technical support for engineering, design, drilling, and construction in the oil industry. This situation has been accentuated by Iraqi war losses and mandatory military duty. Approximately 70 percent of the oil sector's labor force, including high-level engineers and technicians, has been conscripted into the military, [redacted]

[redacted] Some researchers estimate that by 1984 about 40 percent of Iraq's labor force consisted of expatriate workers, most employed by Western firms.

In fact, 75 percent of the foreign companies doing business in Iraq are Western, [redacted]

Western companies have consistently been called upon to carry out Baghdad's most sensitive projects since the start of the Iran-Iraq war. French, Italian, Japanese, Turkish, US, and West German companies all have had prime roles in the design and construction of export pipelines through Turkey and Saudi

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Arabia. US and Japanese firms are involved in seismic interpretation, and Brazilian and French firms have been responsible for designing and constructing oilfield facilities. [redacted]

East European countries, and most notably the Soviet Union, have long been active in the Iraqi oil sector. This is especially true in southern Iraq, where the Soviets have been heavily involved in the operation of the Ar Rumaylah oilfields. East European countries, such as Poland and Romania, are providing several hundred technicians to operate production and refining facilities throughout the country. [redacted]

#### Oil and the War Effort

Iran's recent military gains so far pose little direct threat to Baghdad's rebuilding program. The capture of Al Faw in the south gives Tehran control of key onshore facilities that feed Iraq's Persian Gulf export terminals, but these have not been used in more than five years. The fighting is nonetheless only about 80 km away from such projects as the Iraqi-Saudi pipeline, development of the West Qurnah field, and construction of a gas pipeline from Kuwait. In the north, the much smaller attacks are some 160 km from the well-defended Karkuk oil facilities; consequently, Baghdad does not seem to question its ability to complete expansion of the Iraq-Turkey pipeline. As the success of Iraq's oil program becomes more apparent, however, Tehran may begin to specifically target these facilities. Also, if Baghdad's military position deteriorates further, we believe Iraq might escalate its campaign on Iranian oil exports, which could provoke Iran to increase its level of effort to disrupt Iraq's rebuilding program. In both areas, however, Iraq has taken exceptional measures to fortify and defend oil facilities. Defensive perimeters have been established around facilities, guard posts have been built a few hundred meters apart, and aerial surveillance is conducted along important pipeline routes. Well-defended population centers would have to fall before the facilities could be captured. [redacted]

The Iraqi rebuilding program is important to Iraq's staying power in the war. Although the program has increased Iraq's revenues and contributed to Baghdad's ability to continue the struggle, oil revenues

alone will not swing the balance in Iraq's favor or add significantly to Baghdad's options. It also will not affect prospects for a settlement, because military and political factors, especially Tehran's intransigence, play dominant roles in limiting progress. [redacted]

#### Outlook and Implications

Even if the war continues to grind on and Iraq's Persian Gulf oil outlets remain blocked, we believe Baghdad's rebuilding program will be successful:

- By mid-1987, we expect Iraq to succeed in raising export capacity at least to 2 million b/d with the completion of the Turkish pipeline expansion.
- By the end of the decade, we expect Iraqi export capacity will probably reach 3 million b/d—60 percent of prewar export capacity—with the completion of the second phase of the Iraqi-Saudi pipeline project. If the Saudis agree to rush construction of a temporary IPSA II, Iraq could reach this level as early as mid-1987.
- Moreover, with the December 1985 signing of the West Qurnah contracts by the Iraqis and the Soviets, we expect nearly 300,000 b/d of new oil productive capacity to be available by 1990. This and other gains would provide Baghdad with more than enough capacity to fully utilize the rebuilt export system if sufficient customers can be found.

On the other hand, although projects involving the refining and gas portions of the rebuilding program continue to be carried forward, we believe they are unlikely to be completed by the end of the decade. [redacted]

We believe Baghdad will aggressively market oil as its export capacity expands despite OPEC guidelines and weakening world oil prices. Qassim Taqi, the Iraqi Oil Minister, has repeatedly argued that Iraq's OPEC quota should be at least 2.3 million b/d—about 1 million above its current quota—given the country's

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***Iraq: Odd Man in OPEC***

*Baghdad's relationship with the Organization of Petroleum Exporting Countries has always been uneasy and frequently strained (figure 8). Even though Iraq was a catalyst in OPEC's creation in 1960, Baghdad's view often did not get widespread support within the organization. From the beginning, Iraq's extreme views on controversial issues—particularly those concerning the need for production quotas and the need to set oil prices—caused discord within OPEC. Although Iraq's viewpoints have tended to gain support over time, we believe Baghdad continues to find itself out of step with the OPEC mainstream—if one exists.*

*The concept of production quotas created great friction between Iraq and other organization members. A high Iraqi priority for OPEC was development of an agreed program not only to decide the level of total production but also to allocate it among members. Baghdad never ceased to press its view on the need for individual country quotas based on criteria that take into account oil reserves, development plans, and historical market position. In contrast, Saudi Arabia traditionally opposed any policy for setting national quotas limiting oil production, especially because its large financial surpluses would result in a much lower quota if revenue needs were a criterion for allocation. The softening oil market of 1982 and the need for stronger OPEC actions to control prices led to eventual adoption of this idea.*

*reserves, past production levels, and development needs. Also, Iraq's Deputy Petroleum Minister recently told US diplomats that Iraq will increase its oil exports as quickly as possible with or without approval. We expect Iraq to offer oil on competitive terms in the form of barter, countertrade, and netback pricing arrangements, or simply with straight discounts. Even so, Iraqi exports at Yanbu and Ceyhan have fallen below the amount of crude available for export in recent months.*

*Baghdad's marketing policy is likely to lead to retaliation by its competitors within OPEC, cutting into*

*Iraq has always tended to be lumped in with so-called OPEC hawks, especially on oil pricing issues. There were clear signs of Iraqi delight over the 1973-74 price increases, particularly since Baghdad was about to embark on a very large production expansion program. In the latter part of 1976, in a firm oil market, Iraq was again clearly on the side of the hawks calling for annual price increases of 15 percent, and for 26 percent by the end of the year. At the same time, the Iraqis have been flexible in their own pricing policies and responsive to demand pressures. If this meant cutting their price, then prices were cut as exemplified in mid-1974 and early 1975. In fact, Iraq consistently was accused by OPEC members of secretly discounting prices, an accusation vehemently denied by the Iraqis. In general, during OPEC's first 18 years, Baghdad was always a force to contend with but had little weight in OPEC and few allies.*

*In recent years, Iraq has been the only OPEC member to significantly expand its export capacity—albeit from an artificially low base—and has been one of the main violators of assigned quotas. Riyadh's recent drive to expand exports has put Iraq in the same camp as Saudi Arabia, however, and both are drawing criticism from Iran, Libya, and others for spurring the decline in oil prices.*

*Iraqi sales gains. Even the Saudis may eventually opt to rein in Iraqi exports. Iran obviously has a keen interest in preventing any Iraqi gains in market share and Tehran has threatened to match Iraqi gains on a two-for-one basis—especially in the Japanese market, Tehran's largest customer.*

*The additional oil supplies from Iraq and Iran will add to downward pressures on oil prices—in the absence of further Gulf disruptions. Even if Baghdad*

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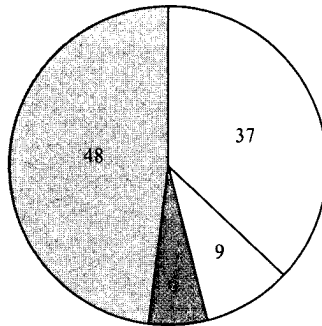
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**Figure 8**  
**Iraq as It Relates to OPEC**

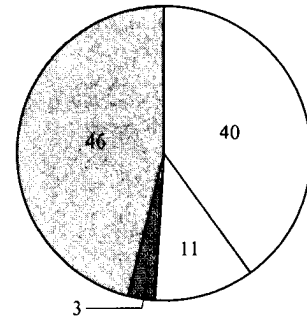
Percent

- Saudi Arabia.
- Iraq
- Iran
- Kuwait
- Others

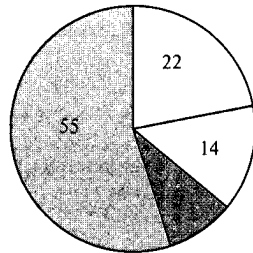
**1980 Production**  
Base=27 million b/d



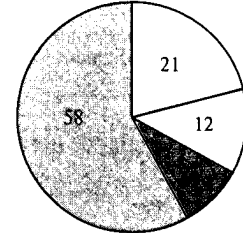
**1980 Exports**  
Base=23 million b/d



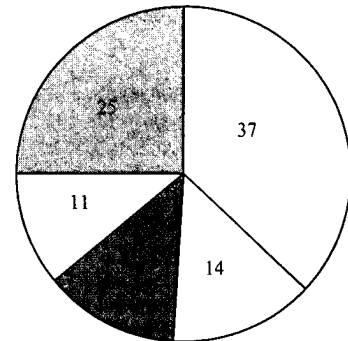
**1985 Production**  
Base=16 million b/d



**1985 Exports**  
Base=14 million b/d



**Proved Reserves**



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**Table 2**  
**Major Iraqi Petroleum Projects**

Project	Description	Lead Contractor	Construction Contractor	Cost (million US \$)	Scheduled Completion	Comment
<b>Export pipelines</b>						
Iraqi-Saudi Phase I	500,000 b/d; 48-inch diameter	Brown & Root (US)	Saipem; Spie Capag (Italy)	508	May 1986	Limited operations started in September 1985.
Iraqi-Saudi Phase II	1.6 million b/d; 56-inch diameter	Brown & Root (US)	NA	1,500	24 to 36 months from start	Riyadh formally approved February 1986. Construction scheduled to begin by December 1986.
Iraq-Turkey expansion	500,000 b/d; 46-inch diameter	Saipem (Italy)	Saipem (Italy), Kututlas, Tekfen	485	June 1987	
Iraq-Jordan (Aqabah)	Up to 1 million b/d, 56-inch diameter	NA	NA	500/1,100	12 to 24 months from initial work	Under discussion since early 1983.
Iraq-Kuwait (gas)	400 million standard cubic feet, 40-inch diameter	NA	C. F. Braun	50	Less than 12 months from initial work	Kuwait financed and built.
<b>Oilfield development</b>						
East Baghdad	30,000 b/d first phase	Compagnie Francaise De Petroles (CFP)	Snamprogetti (Italy)	60-80	1988	Oil to be processed at Dawrah; gas to be supplied to Dawrah power plant.
Safiyah	30,000 b/d peak production	SCOP (Italy)	Technipetrol	10	1987	22° API crude to be processed at Mosul.
West Qurnah	300,000 b/d peak production	Technoexport (USSR)	NA	600	1990	Western firms to supply one-fourth of the equipment.
West Baghdad	Exploration; 31,000 sq km	Mobil (US)	Limex (Drilling)	NA		Disappointing results from five wells.
Majnun	Projected 65,000 b/d production rate	Petrobas (Brazil)	NA			Delayed by war.
Nahr Umr	Projected 11,000 b/d production rate	Petrobas (Brazil)	NA			Delayed by war.
Halfayah	Projected 92,000 b/d production rate	AGIP (Italy)	NA			Delayed by war.

**Table 2 (continued)**

Project	Description	Lead Contractor	Construction Contractor	Cost (million US \$)	Scheduled Completion	Comment
<b>Exploration</b>						
West Baghdad	Reevaluate existing data and conduct exploratory drilling	Mobil (US)	NA	At least 10		
Northwest Region Southwest Region		Japan National Exploration Co.	NA			
Western Desert		Royal Dutch Shell	NA			
<b>Refining</b>						
Hindiayah	150,000 b/d grassroots refinery	Italian-US, Japanese-Romanian, Czechoslovakian companies		1,600	1991	Feedstock may come from the Iraqi-Saudi pipeline. Project to be tendered in 1986.
<b>Gas program</b>						
Trans-Iraqi Gas Pipeline	Phase I—Musayyib power plant supply line.  Phase II—Baghdad to Karkuk connecting line.	TSMPE	NA	300	1987	Soviet financing problems led Iraq to offer the project to West German and French bidders.

[Redacted]

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is successful in raising export volumes to 2 million b/d once the Turkish pipeline upgrade is completed, it would still need to keep its annual average price at about \$18 per barrel just to hold oil earnings steady. This may be tough to achieve if the market remains weak, as many forecasters are predicting for the next several years. [Redacted]

Baghdad needs to maintain good relations with Riyadh because the Saudis control Iraqi access to the Red Sea, which eventually will account for more than 50 percent of Iraq's export capacity. Without Saudi accommodation to Iraqi goals, the major portion of Iraq's rebuilding program could be lost. The Saudis, in turn, have a high stake in Iraq's efforts to hold off the spread of Tehran's Islamic fundamentalism and are likely to be accommodating to Baghdad's financial needs. [Redacted]

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In trying to maximize exports through its new pipelines, Baghdad is likely to aggravate already tender relations with OPEC and other Gulf producers. Baghdad's relations with Riyadh could become more strained if Riyadh denies the Iraqis permission to rush construction of Phase II of the Iraqi-Saudi pipeline. Iraq's relations with both Kuwait and Saudi Arabia will also be further tested if the Kuwaiti and Saudi crude production from the Neutral Zone exported on Baghdad's behalf for war relief funds stops while the fighting continues. [Redacted]

Pressures from friends and foes notwithstanding, Baghdad is likely to press ahead with its export expansion and Iraq will remain a strong market for oil equipment and services throughout the rest of the decade (table 2). Although the Iraqis are interested in

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the technical expertise of US companies—especially the exploration and seismic reevaluation capabilities—high project financing costs put US firms at a disadvantage. This is especially true in areas such as drilling and construction, where foreign financing costs are one-third to one-fourth of US financing costs, primarily because the United States does not subsidize its overseas oil programs. In addition, problems posed by Arab boycott rules may prevent US company participation in some oil development projects, just as they prevented several US companies from taking part in the 1985 Baghdad Trade Fair. As a result, we expect the role of US companies to be limited to a few projects with small project staffs of US personnel. US oilfield supply and service companies will continue to face strong and effective competition from European businesses for Iraqi contracts.

[redacted]

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The Soviets and the East Europeans are likely to see their role in Iraq's oil industry erode over the next few years. We believe Baghdad will provide greater access to Western oil companies—limited since nationalization in 1975 to providing technical support—in the hope of obtaining rescheduled financing arrangements, buyers for its crude, and Western expertise. In our view, shortcomings in Soviet equipment and a lack of Soviet experience in enhanced recovery at fields typical of those in Iraq will lead the Iraqis to increasingly turn to Western petroleum engineering companies capable of providing such expertise. [redacted]

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We would expect any regime in Baghdad to push the oil export system rebuilding effort as long as Iraq is engaged in war with Iran. If the present regime were replaced by one willing to seek accommodation with Tehran, however, Baghdad might shift to a less confrontational policy. Such a strategy could entail cooperation in supporting oil prices by restraining production, perhaps even dropping plans for further export expansion. A new regime influenced by Tehran also might be inclined to impose stronger austerity measures to live within the limits of a scaled-back export program and to reverse the trend toward greater Western participation in oil projects. [redacted]

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