

STANDARD & POOR'S

GLOBAL PROJECT FINANCE

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RAS LAFFAN LIQUEFIED NATURAL GAS CO. LTD.

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RATING ASSIGNED

OUTLOOK: STABLE

NEW ISSUE

US\$400 million 7.628% bonds due 2006

US\$800 million 8.294% bonds due 2014

Rating: BBB+

RATIONALE The rating on the Ras Laffan Liquefied Natural Gas Co. Ltd.'s (Ras Laffan) offering of US\$400 million bonds due 2006 and US\$800 million bonds due 2014 as part of its financing of the US\$2.4 billion project in Qatar, incorporates the following risks:

- Several, but not joint, unconditional sponsor completion guarantees (which repay debt if the project does not achieve its commercial acceptance date—a project strength) that effectively have Mobil Corp.'s 'AA' rating for 30% of the guarantee, but only Qatar General Petroleum Corp.'s (QGPC) 'BBB' rating for the remaining 70%;
- Event risk related to regional conflicts or disturbances that could temporarily impair liquefied natural gas (LNG) deliverability; and
- If called upon, a Qatari legal system that might not be able to enforce the remedies that the legal and financing documents provide.

However, the following strengths offset the risks at the 'BBB+' plus level:

- An offshore New York trustee to which all revenues from Korea Gas Corp. (Kogas) and others, which are in U.S. dollars, are paid and from which all expenses, debt service, and equity distributions are paid;
- The project's strategic importance to Mobil Corp., Qatar, and Kogas, particularly given the multibillion dollar capital commitments to LNG that the buyer and sellers separately have made;
- Use of commercially proven, current LNG and offshore natural gas production technology;
- A take-or-pay Sale and Purchase Agreement (SPA) with Kogas that features the higher of a crude oil based, LNG proxy market price or a minimum floor price that sufficiently guarantees debt service obligations;

- Five years of natural gas production history from Qatar's North Field, one of the world's largest gas fields, that more than adequately confirm the 7.11 trillion cubic feet (TCF) of reserves needed to supply the project's Kogas SPA;
- Construction activities that are on schedule with engineering, procurement, and construction (EPC) contracts awarded and signed;
- An international construction team of the leading LNG process and offshore oil and gas contractors, including JGC Corp., MW Kellogg, McDermott-EPTM East Inc., Saipem SpA, and Chiyoda Corp.;
- Mobil's 20 years of LNG experience in Indonesia and, more recently, its 10% interest in Qatar Liquefied Gas Co. Ltd. (Qatargas), which give Mobil about 12% of the world's LNG market share; and
- A minimum project debt service coverage ratio (DSCR) of 1.79 and an indenture loan life coverage ratio of 2.31 for a one train (an LNG production facility) case and for the two train option, a minimum 1.55 DSCR and an indenture loan life coverage ratio of 2.49.

Ras Laffan will use the proceeds of the 144A bond offering to construct a US\$2.4 billion, 2.6 million metric ton per annum (MMTA), single LNG train in Qatar. Project and financing documents provide Ras Laffan with the option of building a second train for an additional US\$1 billion if certain tests are met and approved by lenders. Project sponsors are Mobil QM Gas Inc. (Mobil), a wholly owned subsidiary of Mobil Corp. ('AA' corporate credit rating; stable outlook) at 30% and QGPC ('BBB' corporate credit rating; stable outlook) at 70%. Kogas, which is 50.1% owned by the Republic of Korea ('AA-' foreign currency rating; stable outlook) and 34.5% owned by Korea Electric Power Co. (Kepco) ('AA-' foreign currency rating; stable outlook) has entered into a 25-year SPA with Ras Laffan that requires LNG deliveries to begin on or about Aug. 1, 1999.

PROJECT FINANCE ANALYSIS

OUTLOOK The Ras Laffan project benefits from robust economic fundamentals, a highly experienced and committed sponsor (Mobil Corp.), and a continuously improving LNG market, which should not change adversely during the next 20 years. The 'BBB+' rating, which is a notch higher than Qatar and QGPC's 'BBB' foreign currency ratings, balances modest credit enhancements contained in the project structure, including Mobil and Qatar guarantees and an offshore trust, with regional event risks closely intertwined with the Qatar and QGPC credit risks. These enhancements, combined with the project's strategic importance to its sponsors and Kogas, as LNG buyer, allow Standard & Poor's to conclude that the project's bond rating will not erode. However, DSCRs with modest upside potential and long-term political risk in the region, as captured by the Qatari foreign currency rating, likely will limit upward rating movement in the next one to three years.

RAS LAFFAN PROVIDES STRATEGIC ASSET TO SPONSORS

Market for LNG Since 1980, the use of natural gas as a fuel source worldwide has steadily increased with consumption growing at about 3% per year. However, this 3% growth pales in comparison with growth levels in East Asia, most notably Japan, Korea, and Thailand—countries without indigenous supplies or pipeline access to supplies. Japanese natural gas consumption has been growing at about 6.2% per year since 1980. In Korea, a late comer to natural gas, consumption since 1987 has grown at a staggering annualized pace of over 20% per year; Kogas expects demand to continue to grow at about 7% annually through 2006.

In the East Asian energy markets, LNG enjoys a unique niche position. These markets, which have insufficient or no capacity to supply natural gas by conventional means, must rely almost strictly on LNG for gas supplies if gas is to be used. Hence, LNG competes only with other fuels, primarily coal, oil, and nuclear. In this regard, LNG holds a competitive advantage for several reasons. Concerning nuclear power, the regulatory process and public opposition to new plants make nuclear power unlikely to be a significant force in power generation. Similarly, opposition in Japan and Korea to coal plants, due to environmental issues and limited siting availability, make significant new coal generation capacity unlikely. Oil-fired generation's high sulfur emissions problems and over-dependency concerns from supplies concentrated in the Middle East limit oil's attractiveness. In contrast, natural gas-fired, combined cycle plants are less demanding on the land and the environment, are cost effective, and energy efficient, even with higher gas prices.

Using LNG, especially in power generation, requires the providing utility to make enormous infrastructure investments. LNG tankers and large and specialized unloading and storage facilities are necessary. In addition, LNG buyers must build natural gas transmission and distribution systems. Such infrastructure expenditures can cost a country, such as Korea, billions of dollars. Hence, once a country is committed to using LNG, its gas utility must find and secure economical and long-term LNG supplies to resell and guarantee a return on its capital investments in the infrastructure. As has been the case with most LNG supplier-buyer arrangements, once a buyer has identified a satisfactory supplier and agreed to financially acceptable terms, the relationship takes on semipermanent characteristics.

Sponsor Benefits Such long-term relationships in the LNG industry are ones from which Qatar and Mobil can benefit. With the discovery of the North Field in 1971, Qatar immediately moved into the position of holding the world's third-largest natural gas reserve base—one that could potentially make Qatar the dominant LNG supplier in the next century. Most LNG has come from Malaysia, Indonesia, Australia, Algeria, United Arab Emirates, and Brunei. None of these countries, however, have anywhere near the reserves of Qatar, even on a collective basis. That virtually all of the Qatar gas reserves are in one, highly productive, easy to produce, reservoir, further distinguishes Qatar's reserve base from the rest of the world.

The development of the Ras Laffan LNG production facility would allow Qatar to exploit its natural gas supplies and would increase Mobil's growing world market share of LNG, currently at 12%. Few other accumulations of natural gas are as easily accessible or producible as the North Field. An LNG producer since 1977, Mobil has targeted substantial growth in both its volumes delivered and its share of the world LNG market. Mobil views the Qatargas and Ras Laffan projects, which both will produce from the North Field, as projects that are strategically critical to achieving corporate LNG objectives. In support of its LNG strategy, Mobil has established an LNG support group in Houston and a specific business unit (Mobil Power) to develop new markets.

The Ras Laffan project also helps the government of Qatar meet a number of strategic objectives, one of which is to reduce revenue volatility by diversifying away from the country's reliance on oil exports. Sixty-five to 75% of Qatari revenues come from crude oil exports. To this end, Qatar intends to take advantage of its vast natural resource base through two LNG projects—Qatargas, which recently completed its first LNG train, and Ras Laffan. In addition, Qatar is pursuing a number of exploration and

development production sharing agreements with foreign oil companies.

PROJECT BUSINESS STRUCTURE MINIMIZES DEFAULT RISK

While economic incentives are one of the more important credit determining aspects of an LNG project, the business structure of the relation may be even more important. After the supplier and buyer consummate the long-term relationship, competition between LNG suppliers for buyers becomes moot. The structure of the supply chain and its long-term viability become the more dominant concerns. LNG supply venture structures usually include the following elements:

- Company or state sponsors, or both;
- LNG SPA;
- LNG technology and its providers;
- An exceptional natural gas reserve base;
- Project management; and
- Buyer country support.

Sponsors. From the perspective of business structure risk, the Ras Laffan venture benefits from having creditworthy and experienced LNG participants. Mobil Corp., through its wholly owned subsidiary, Mobil, and QGPC, the Qatari state-owned oil company, formed

Ras Laffan as a special purpose joint venture in 1992 pursuant to an Emiri Decree. The joint venture has a 25-year life that can be extended by mutual agreement between its sponsors. Mobil is a 30% sponsor and stockholder of Ras Laffan at the time of this analysis. QGPC is a 70% sponsor (see *Representative Ras Laffan Business Structure*).

As of this report's publication, Ras Laffan has signed memorandum of understandings that will allocate about 7% of Mobil's and QGPC's collective interests to two Japanese trading companies—Itochu Corp. and Nissho Iwai Corp. These two firms will potentially market LNG capacity beyond Kogas' SPA allocation to Japanese customers.

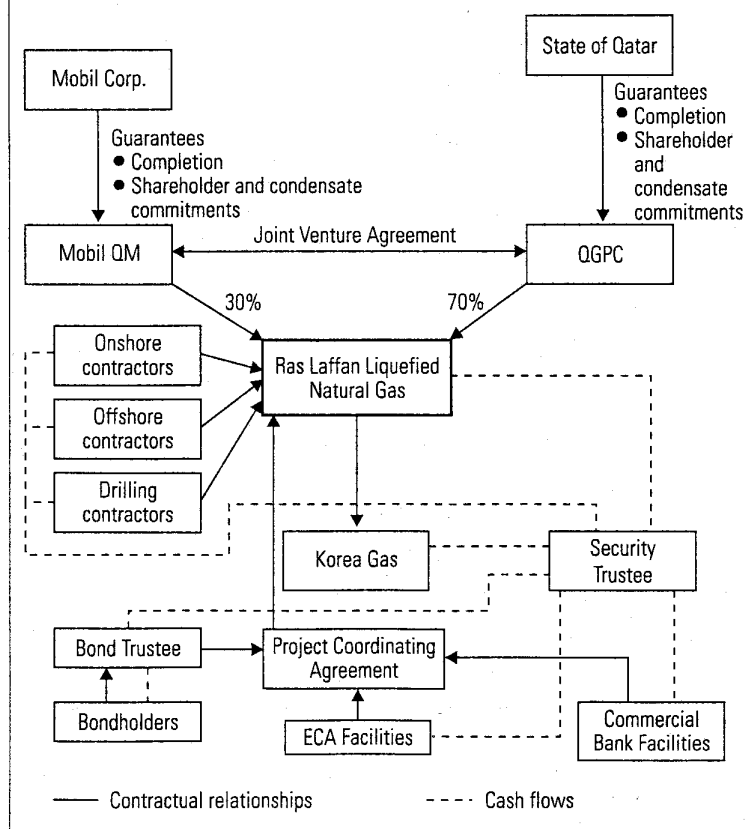
SPA. Kogas, the second key element of the project structure, has entered into a 25-year SPA with Ras Laffan for most of the project's output. Kogas is Korea's largest stated-owned gas company (50% ownership by the Korean government; 34.7% ownership by Kepco, which in turn is 78% owned by the Republic of Korea; and the remaining 15.3% by Korean municipalities).

Technology. Several construction companies will provide the LNG technology. The offshore production facilities and platforms will be built by McDermott-ETPM, East Inc. and Chiyoda; McDermott, which is one of the world's largest offshore marine contractors, has built most of the platforms in the Persian Gulf and is the largest resident marine contractor in the Persian Gulf. A joint venture between JGC and MW Kellogg will build the onshore LNG facility; together the two companies have been EPC contractor for the world's major LNG facilities, including those in Australia, Indonesia, United Arab Emirates, Algeria, Oman, Nigeria, Qatar, and Malaysia. Finally, Saipem, a wholly owned subsidiary of ENI SpA, the Italian state-owned oil company and seventh-largest traded oil company in the world, will install the various subsea pipelines. Saipem, one of the leading international oil and gas contractors for pipelaying and heavy lift operations has a large fleet of construction vessels, which includes the world largest crane vessel.

Mobil QM Mobil Corp. ('AA' corporate credit rating) is one of the world's largest, vertically-integrated, oil companies. With 1995 operating earnings of US\$2.8 billion on revenues of US\$75 billion and a capitalization of US\$40 billion, Mobil ranks among U.S. oil companies first in net wells drilled, second in revenue, net income, and stockholder equity, and third worldwide in liquids production. Its global business encompasses oil and natural gas exploration, production, refining, petrochemicals, and marketing.

Mobil has substantial experience in LNG production, owing to its 30% ownership of PT Arun LNG Co. in Indonesia, which has been producing LNG since 1977. Mobil's commitment to Ras Laffan underscores the project's

REPRESENTATIVE RAS LAFFAN BUSINESS STRUCTURE



strategic importance to Mobil; it has committed a minimum of US\$250 million and its personnel with petroleum engineering, drilling, and LNG technological expertise to the joint venture—with experience more than adequate to complete the project as planned.

QATAR AND QGPC QGPC, the second sponsor and wholly owned by the State of Qatar, owns the remaining 70% of Ras Laffan stock. QGPC, which was formed via a law decree in 1974, assumed responsibility in 1988 from the Department of Petroleum Affairs for all aspects of the petroleum industry within Qatar. QGPC's reserves of 3.7 billion barrels and production of 438,000 barrels of oil per day make it one of the smaller producers in the Gulf. Because of its close links to the government and strategic importance to the national

economy, QGPC's foreign currency credit rating matches the state's rating (*see box*).

LNG SUPPLY CONTRACT CREATES A STABLE REVENUE STREAM

LNG projects generally distinguish themselves from other energy and infrastructure projects such as oil and gas production, power generation, and mining in two ways: 1) upfront capital expenditures are enormous, usually US\$1 billion per MMTA capacity; and 2) no well-developed commodity market exists for LNG. Hence, LNG projects usually feature unique contractual relationships between the supplier and a specific buyer. Both parties must commit not only to selling and purchasing LNG, but to making the necessary capital expenditures needed to produce, store, transport, and use the LNG. For lenders to project

QATAR (STATE OF)

In connection with Ras Laffan Liquefied Natural Gas Co. Ltd.'s upcoming bond issue, Standard & Poor's recently affirmed its 'BBB' long-term and 'A-3' short-term foreign currency ratings on the State of Qatar. The outlook on the ratings is stable.

The ratings are based on Qatar's:

- Large natural gas reserve base, the world's third largest, which is 14 times Qatar's proven oil reserves in equivalent billions of barrels;
- Modest, but growing, oil reserves, enough to support over two decades of output at current production levels;
- Responsible economic management, underpinning the development of a modern physical and social infrastructure, and appreciable rise in living standards over the past two decades. Per capita income of nearly \$13,000 is the highest in the Gulf region after Kuwait and the United Arab Emirates; and
- Financial flexibility afforded by undisclosed, but probably sizable, official foreign assets.

Creditworthiness is constrained by:

- A small, open, and narrowly based economy heavily dependent on oil and gas and exposed to changes in energy prices. High economic concentration heightens the importance of effective management of volatile fiscal revenues and external liquidity as a key rating factor;
- Fiscal deficits—averaging close to 7% of GDP between 1992-1996—stemming from sizable personnel and defense outlays, and gas-related capital expenditures. The government's debt burden has more than doubled since 1992 to an estimated 58% of GDP in 1996;
- A level of financial disclosure well below that of most other investment-grade sovereigns; and

- Security and event risks posed by long-term domestic political and regional uncertainties, including possible regime changes in neighboring countries.

These risks are somewhat mitigated by strong diplomatic and military support by the U.S. and other Western countries.

The government's large-scale and primarily debt financed investment program to develop the North Field gas reserves is expected to cost \$7.8 billion, \$5 billion of which will be debt financed. As a result, Qatar's public external debt burden should reach an estimated 185% of exports by 1999 from 71% in 1995, high compared with similarly rated sovereigns. Nevertheless, revenues from gas sales—first delivery of which is scheduled for January 1997, and is expected to exceed \$1 billion in 1998—should augment and stabilize government revenues, support the growth of gas-related industries, and diversify Qatar's export base. At the same time, new oil discoveries and the use of enhanced production technologies are expected to extend the life of oil reserves, and raise oil production to over 550,000 barrels per day by 2000. These, in turn, should narrow budget deficits and reverse growth of the public debt burden longer term.

The stable outlook balances the fiscal benefits expected from substantially higher oil and gas output with the challenge of managing a still highly concentrated economy. Moreover, geopolitical risks, which are difficult to predict, could limit upward movement in the rating. The revenue windfall resulting from rising oil prices should lower the budget deficit to under 5% of GDP this year and next. However, the government is unlikely to achieve its longer-term goal of fiscal balance without a stronger commitment to reduce the size of the public sector.

financed LNG projects, particularly in the capital markets, the LNG purchase agreement provides the main assurance of a firm market and a bankable asset upon which to secure financing. Without the guaranteed market, the gas reserves and the facilities are likely to become worthless, even to creditors.

The LNG SPA, into which Ras Laffan and Kogas have entered, provides a take-or-pay agreement that solidifies the project's business structure. The combination of minimum take volumes, contract floor prices, and capital expenditure commitments provides lenders with the assurance that Ras Laffan will have a stable and predictable revenue source that will generate sufficient cash to service debt obligations.

The 25-year agreement, which requires LNG deliveries to begin on or about Aug. 1, 1999, contains the following key requirements for:

- Ras Laffan
 - 1) To arrange for appropriate wells and offshore gas production facilities;
 - 2) To produce and sell gas from the North Field; and
 - 3) To construct, maintain, and operate LNG processing, storage, berthing, and loading facilities.
- Kogas
 - 1) To construct and maintain LNG unloading and storage facilities;
 - 2) To provide, maintain, and operate a sufficient number of LNG tankers; and
 - 3) To take delivery of an annual base contract LNG quantity of 2.4 million metric tons.

Contract Quantities The SPA provides for a base annual contract quantity (BACQ) of 2.4 MMTA. However, it considers that operational and other constraints associated with the production, shipping, and use of LNG may make it impractical to actually ship the contract quantity in a calendar year; it would be uneconomical, for instance, to ship a partial tanker load. Hence, from time to time Ras Laffan may ship more or less than the contract quantity.

From a lender's perspective the possibility of Ras Laffan shipping less than the BACQ should not present a cash flow risk. The LNG agreement provides a series of "true-up" mechanisms that set up deficiency and surplus accounts for the buyer and the seller. Each year the parties will determine an adjusted annual contract quantity (AACQ) that will reflect upward or downward adjustments from prior years. Lender protection comes from a 5% downward flexibility limit in any one year. A 5% downward flexibility has a minimal effect on debt service. In addition to the annual limit, the sales contract limits the total downward flexibility amount outstanding to 10% of the BACQ. A worst case scenario would then be two years in a row of 5% downward adjust-

ments—a situation that would not threaten debt service.

The buyer's take-or-pay obligation provides lenders with additional protection against revenue deficiencies. Notwithstanding any adjustments due to downward flexibility and amounts actually taken and paid for, the buyer must also pay any deficit amount if gas taken is less than the AACQ. However, bondholders do assume the risk that Ras Laffan might be unable to make the AACQ available, an occurrence, though rare, whereby the buyer's obligation to purchase would be reduced by the unavailable amount. The size and deliverability potential of the North Field make this scenario highly unlikely.

Force Majeure Deficiency Risks Lenders assume the typical *force majeure* risks of war, natural disturbances and strikes, which might affect either shipping or the production/receiving facilities, or both. In addition, lenders assume the *force majeure* risk of premature depletion of the natural gas reservoir—an extraordinarily remote risk. The sales agreement mitigates most *force majeure* risks through two mechanisms as best possible for a natural resource extraction project. First, the buyer may request that Ras Laffan deliver any *force majeure* deficiency in the subsequent year up to the lesser of the *force majeure* deficiency or 2.5% of the BACQ. Alternately, if the buyer has not requested this make-up amount, Ras Laffan may add to the BACQ during the next five-year period. If a longer period is needed, the parties will negotiate a deferred delivery schedule.

Despite the two mitigating strategies provided by the sales agreement, lenders still assume an unmitigated risk that if a *force majeure* event reduces tanker availability for an extended period, seller may reduce permanently the BACQ. While this could conceivably result in a default on the loans, the history of LNG tanker shipments indicates that this risk statistically is a *de minimus* risk: no LNG tanker has ever been lost to a *force majeure* event.

Pricing The sales agreement pricing terms underscore the notion that parties to LNG projects have few alternatives concerning other sellers or buyers. To get both parties to commit to the required capital expenditures, LNG pricing and attendant revenues must be such that the seller can be confident that it will comfortably cover its expenses and fair economic return. Conversely, the buyer must be prepared to pay a price that will not disturb its own energy supply economics. The supply agreement does both and protects lenders. The agreement specifies a target sales price that is largely indexed monthly to the basket of crude oils delivered to Japan. However, the sales agreement eliminates market price risk to the project by setting a minimum LNG price, US\$2.81 per MMBTU (1997\$) which escalates at 3.0% per year. Even at the minimum price, the

project, as discussed later, can fully meet its fixed obligations.

The SPA includes a most favored nation (MFN) provision concerning the minimum sales price that could place lenders at risk. If a Japanese LNG buyer and another seller operating in the State of Qatar negotiate an SPA with more favorable minimum price provisions, Kogas would have 45 days to elect an option that would adjust the ex-ship minimum LNG price downward. However, this MFN provision should not place lenders at a material risk. Sensitivity analyses that test a 10% lower floor price suggest the project could withstand a lower price and still maintain adequate debt service coverages. Moreover, it seems unlikely that another LNG project in Qatar, to which QGPC would certainly be a party, would agree to another SPA that would materially harm Ras Laffan.

Transportation The sales agreement specifies that the buyer (Kogas) will be responsible for transportation from the Ras Laffan loading port to the unloading port in Korea. Transportation should be ready by the time the LNG facility is ready to produce LNG. Kogas has already awarded to Korean ship builders the tanker construction contracts. Pursuant to the terms of the SPA, Kogas must provide, maintain, repair, and operate LNG tankers with Ras Laffan approval. In addition, Kogas must use the tankers exclusively for Ras Laffan LNG. Shipping LNG via ocean going tanker is a commercially proven venture with no record of mishaps at sea or in port; hence the Ras Laffan transportation arrangements should present little risk to the sales agreement, especially since take-or-pay features dominate the delivery terms.

PRICE INSENSITIVITY AND FEW SUBSTITUTES CHARACTERIZE LNG MARKET

Unlike power, transport and mineral extraction projects, among other project financed transactions, LNG price and supply arrangements do not lend themselves well to an analysis of comparative projects. The pricing of long-term LNG supplies into markets without direct competition with natural gas and where power generation consumes most of the gas relies most heavily on the buyer and the seller agreeing on arrangements that allow their respective businesses to be competitive within their industries. Reliance upon some measurable value, such as the long run marginal cost of power, simply is not feasible. However, as described above, the SPA uses a pricing formulae that conforms to mechanisms used in most other LNG projects: that is, one that has a link to the largest LNG market, Japan, and relies upon the price of Japanese imported crude oil.

As a result, once the parties to an LNG transaction have committed themselves to the SPA, price comparisons tend to be less relevant.

Moreover, the history of Japanese LNG projects would suggest that buyers have gone to considerable effort to ensure the stability of their strategic supplies. Given the potentially serious consequences at home of a disruption to the supply chain, buyers through upward pricing adjustments have sought to ensure that sellers can meet their costs of supplying LNG.

Table 1
Estimated LNG Delivered to Japan
(US1997\$ per MMBTU)

Ras Laffan	Borneo	Australia	Alaska North Slope*	Indonesia-Natuna*
3.88	3.20	4.60	4.80	5.90

*Projects under construction. Sources: Oil and Gas Journal; Gas Strategies.

Despite the price inelasticity of LNG supplies, lenders should have comfort that when compared with other LNG supply arrangements, Ras Laffan's pricing is comparable. Table 1 indicates that cost of service delivered to Japan for several projects ranges from about US\$3.00 per MMBTU up to about US\$6.00 per MMBTU. Ras Laffan's price in 1997 would be about US\$2.81 plus shipping of US\$1.07 for a total delivered price of US\$3.88 per MMBTU. Furthermore, if oil prices do fall for a sustained period, Ras Laffan should not be at risk of pressure to renegotiate its contracts. One factor that complicates comparisons is that different pricing formulae react differently to oil price changes. Ras Laffan's pricing, for instance, will tend to increase more rapidly with increasing oil prices than other supplies, but will also decrease more quickly than others.

NATURAL GAS SUPPLIES WILL NOT AFFECT CASH FLOW

The risk that the North Field will not be able to supply sufficient gas for the 25-year duration of the supply contract with Kogas is virtually *de minimus*. As limited by the LNG plant design capacity of 5.21 MMTA, the project will need only 7.11 TCF of the field's proven 265 TCF reserves, or about 3% of the reserves.

Because of the high cost of initiating LNG projects and the necessary long-term commitments, often spanning decades, between supplier and buyer, lenders must have the highest confidence that adequate gas supplies will be available to justify the capital expenditures. Specifically, acceptable gas supply arrangements must satisfy three criteria:

- A significant gas resource base must exist,
- Well deliverability and reservoir performance must ensure that the LNG train receives a steady gas stream, and
- The gas production operator must have the technical and financial skills needed to prudently manage the gas resource base and production.

Table 2
Natural Gas Reserves Of LNG Exporters

Country	Published gas reserves (TCF)	Reserve rank	LNG Exports (bct/year)	Reserve life (years)
Former Soviet Union	1,977	1	0	N.A.
Iran	742	2	0	N.A.
Qatar	250	3	550*	454
United Arab Emirates	188	4	240	783
Saudi Arabia	185	5	0	N.A.
United States	164	6	57	2,900
Venezuela	140	7	0	N.A.
Algeria	128	8	646	198
Nigeria	110	9	0	N.A.
Iraq	110	10	0	N.A.
Indonesia	69	11	1,170	59.0
Mexico	68	12	0	N.A.
Malaysia	68	13	456	149
Libya	46	19	53	864
Australia	20	25	346	57.8
Brunei	14	28	297	47.1

*Qatar's exports are listed here as an approximately prospective amount. LNG shipments from Qatargas will not begin until next year. A 2,900 year reserve life for the U.S. is misleading because only gas reserves in Alaska are exported as LNG. Since most U.S. reserves are in the lower 48, the U.S. LNG reserve life number is actually much lower than 2,900. N.A.—Not applicable. Sources: Oil and Gas Journal, July 1, 1996; 1996 BP Statistical Review of World Energy.

By all measures, the Ras Laffan project's gas supply arrangements should ensure a reliable supply of gas.

Resource Base Discovered in 1991, Qatar's North Field is one of the world's largest offshore nonassociated gas fields, covering over 6,000 square kilometers—about half the size of the state of Connecticut. Compared against the world's gas reserves, Qatar's North Field ranks third largest and accounts singularly for 9% of the world's proven reserves. More importantly, compared with countries with LNG export projects, Ras Laffan and Qatar's other LNG projects benefit from having the largest natural gas resource base (see table 2). Furthermore, few LNG exporting countries have the reserve life, as measured by reserves divided by exports per year, that Qatar prospectively enjoys.

Moreover, few, if any, LNG projects have access to a reservoir as large as the North Field. Most LNG projects tend to rely on getting natu-

ral gas from multiple fields as they deplete one field and connect to other fields. The risk that the track of the North Field dedicated to the project might have insufficient reserves for the project is mitigated by an expansion agreement with the government that allows the Ras Laffan contract area to expand to other areas of the North Field.

Netherland, Sewell & Associates Inc., the reserves consultant, has opined that the estimated gas-in-place is more than sufficient to maintain deliverability exceeding the project's approximate 1 billion cubic feet per day (BCFD) requirement over the contract period.

Deliverability and Reservoir Performance A five-year production history from the North Field Alpha (NFA) platform supports the conclusion that deliverability and reservoir performance risk to the project is negligible. The NFA's 16 wells have been producing at an approximate rate of 800 million cubic feet per day (MMCFD) with little evidence of reservoir pressure decline. In addition, the reserves consultant's extensive modeling of the reservoir indicates that the 15 wells to be drilled for the Ras Laffan project will be sufficient to produce the 1 BCFD of gas needed for the length of the supply contract.

LEGAL AND FINANCIAL STRUCTURE PROTECT LENDERS FROM DEFAULT EVENTS

Capitalization Mobil, the 30% sponsor and QGPC, the 70% sponsor, expect to capitalize the one train Ras Laffan project with about 47% debt and 53% equity. Against other project financed transactions that Standard & Poor's has reviewed, this relatively low leveraged project could be a measure of sponsor commitment, especially as nearly \$400 million in equity will be spent before any of the debt facilities will be available (see table 3). It is also indicative of the project economics. Revenues from the Kogas SPA simply would not be sufficient to cover debt service comfortably in a higher leveraged, one train project. However, being an extraordinarily capital intensive undertaking, LNG does benefit from economy of scale. If a second SPA can be secured, Ras Laffan will likely exercise the option to build a second train. If this happens, the Ras Laffan debt leverage can comfortably increase from just below 50% up to about 75% and realize comparable debt coverage levels.

Project financing documents, which were drafted with the intent of building the second production train, protect lenders from Ras Laffan's potential to issue debt in such a manner that would adversely affect its ability to service debt obligations. The bond indenture, for instance, limits one train debt levels to a maximum \$1.2 billion. Any additional debt incurrence is restricted by a rating confirmation requirement that affirms the existing rating as

Table 3
Ras Laffan Expected Capitalization

Funds	One train case		Two train case	
	Mil. \$	% of total	Mil. \$	% of total
Senior project debt				
Bonds due 2006	400	15.4	400	10.5
Bonds due 2013	800	30.8	800	21.0
ECAs	0.0	0.0	900	23.6
Commercial banks*	0.0	0.0	450	11.8
Total senior debt	1,200	46.2	2,550	67.0
Equity				
QGPC	900	34.6	595	15.6
Mobil QM	386	14.8	255	6.7
Total equity	1,286	49.5	850	22.3
Net operating cash flow	114	4.4	407	10.7
Total expected funds	2,600	100.00	3,807	100.00

*The break out between ECAs and commercial banks is uncertain at publication, but ECAs will likely dominate the financing.

well as confirmation that DSCRs are projected to meet required levels.

Project documents allow Ras Laffan to exercise its options with EPC contractors to build a second train if an SPA is entered into with an 'A' rated buyer. In addition the allowable debt on the second train depends on the sales amounts negotiated with the LNG buyer as follows:

- Up to 65% debt for 3.8 MMTA total LNG sales;
- Up to 70% debt for 4.2 MMTA total LNG sales; and
- Up to 75% debt for 4.8 MMTA total LNG sales.

Security Trust Agreement One of the key aspects of the Ras Laffan transaction, which allows the senior debt rating to exceed Qatar's 'BBB' sovereign foreign currency rating, is the Security Trust Agreement. All parties to this transaction, including Kogas, have entered into a trust agreement that requires, among other things, for all revenues and proceeds to be deposited directly with the New York trustee, Credit Suisse. The trustee, then, according to a priority payment schedule, will insure that lenders will receive interest and principal payments, after operations and maintenance expenses have been met, without potential interference from Ras Laffan or Qatar. Hence, even if project ownership changed due to some political event within Qatar, for instance, bondholders would have a reasonable assurance of payment as long as Kogas and other buyers associated with the prospective second train—all parties to the trustee agreement—were purchasing LNG.

Distributions to the sponsors, which only the trustee can make, can only come after certain tests have been met, including a determination that the debt service reserve account is fully funded. In addition, loan life coverage ratios, actual and projected, must exceed 1.40.

The security trustee will also keep the next six months debt service reserve account as required by the bond indenture.

Project Coordination Agreement A Project Coordination Agreement governs relations among the export credit agencies (ECAs), the commercial banks, and the bondholders. While its covenants are more restrictive than the indenture, the agreement could tend to favor the ECAs and banks concerning project operations and additional investment decisions, which would be appropriate if the second train option becomes viable and bonds end up with a minority exposure to the project.

However, the benefits to the ECAs and commercial banks have should not place bondholders at risk. For instance, the agreement requires Ras Laffan to maintain a minimum 30%, which may be reduced to 25% if the project meets ad-

ditional debt tests. The ECAs and the banks must approve any SPA into which Ras Laffan wants to enter. Other requirements of the agreement, which should benefit bondholders and the potential ECAs and banks include:

- Additional debt is issuable only if project forecasts minimum DSCR of 1.30 and loan life coverage ratio greater than 1.70;
- Project revenues must be deposited with the security trustee;
- Ras Laffan must allow the senior project lenders to obtain valid, perfected, and enforceable security interest in project property if Qatari law changes;
- The project is restricted from selling assets over US\$30 million in any calendar year; and
- Ras Laffan cannot issue capital stock before the completion date without consent of the intercreditor agent: after completion both owners must maintain 21% each, and 5% in total, of the economic interests and voting rights.

Intercreditor Protection The Intercreditor Agreement, into which the commercial banks, the multilateral lending and export credit facility agents, the bond trustee, the security trustee, and the intercreditor agent intend to enter, governs the relative rights and obligations of the secured parties concerning Ras Laffan's indebtedness. This includes the decision making process, voting, approval of rights and waivers, and limits on enforcement rights. The Intercreditor Agreement's intent is to ensure that bondholders, the ECAs, and the commercial bank lenders have rights equal to their exposure in the project, particularly as principal amortizes and relative exposures change. In general, bondholders have the assurance that the combination of the Intercreditor Agreement and the provisions of the Project Coordinating Agreement and other financing and project documents are integrated. The risk that the banks and multilateral agencies could take actions that would harm the interests of bondholders should be remote.

Most notably, the Intercreditor Agreement prevents any modification to the bond document or any Credit Facility Agreement without the written consent of the bond trustee or the applicable lender representative. Votes are allocated to each party on the dollar basis of the total aggregated outstanding loans or bond principal with one notable exception. Before the end of the availability period—generally the earlier of the project completion date or five months after the final acceptance certificate—ECAs or facility agents votes equal their total facility commitment compared to bondholder's outstanding balance. While this vote allocation may give disproportionate power to lenders other than bondholders, it does not apply after project completion or if a decision to accelerate debt payment occurs.

In general, senior secured parties will ratably receive distribution payments from any payments received by the intercreditor agent or security trustee in the following order: outstanding unpaid indemnity claims, fees, or other charges; unpaid interest due; and then, principle payments due. The Intercreditor Agreement insures that each party's claim on collateral and other distribution ranks *pari passu*. Proceeds from any liquidation arising from a default would be distributed *pro rata* as the Qatari legal system permits. Signees to the Intercreditor Agreement have agreed that all collateral pledged is for the joint benefit of all the secured parties—bondholders, ECAs, and commercial banks—and that no party has received a security or guarantee other than what is provided to all secured parties.

Bondholders share equal rights as the other senior lenders concerning modifications and instructions on fundamental aspects of the financing documents. Such changes would include calculation and payment of debt obligations, currencies, commitment amounts, conditions affecting waivers of default events, and the Intercreditor Agreement, among others. The Intercreditor Agreement requires the consent of 100% of votes cast; hence bondholders are not at risk of lenders with more votes changing documents fundamentally in a way that would harm bondholders. Changes concerning material aspects of the financing documents, as opposed to fundamental aspects, however, require the consent of 51%-67% of the votes cast, which is likely to be the majority that nonbondholders would have in the one train case before amortization begins; after amortization begins, bondholders percentage of votes would increase. In the two train case, bondholders would be in a minority for a much longer period. The risk to bondholders seems minimal in either the one or two train options: all lenders generally have similar economic interests in the project.

If a fundamental event of default or potential event of default occurs, the intercreditor agent must notify the lender representative and the bond trustee. Voting parties will generally then receive a notice describing what remedies will be taken. Fundamental events of default are expected to require a 75% majority vote from both banks and bondholders to be taken before beginning the remedy. Because bondholders will be a minority voting party, there could be a risk of a blockage of a remedy if commercial lenders wanted to act with more leniency. If no blockage occurs, then the intercreditor agent must act to exercise remedies. Either lender group can trigger a nonfundamental event of default, but it is expected that a 67% group consent is required before actions are taken.

Insurance The Joint Venture Agreement and Project Coordinating Agreement require the following insurances to be carried:

- Well control insurance during exploration and development drilling;
- Construction risk insurance covering physical loss or damage to property and material, including in transit;
- Operating insurance for full replacement physical loss and damage to property during operations; and
- Business interruption insurance.

A catastrophic event at the onshore or offshore facilities could conceivably cause an extended outage and losses for which the US\$200 million business interruption policy would help mitigate. The excellent, and generally uninterrupted, performance of other LNG facilities, including those in parts of the world that have experienced political tensions and civil disturbances, mitigates the risk of interruption.

LNG AND GAS PRODUCTION TECHNOLOGY PRESENT MINIMAL RISK

Against most project financed construction projects, the Ras Laffan project, which will have taken five years to construct, might at first appear to present unusual risks to lenders. If Ras Laffan proceeds with the two train configuration, the total project cost would be about \$3.4 billion. The single train facility would cost about US\$2.4 billion. A construction and drilling consortium of five of the world's largest marine and process EPC contractors, offshore drilling contractors, and numerous subcontractors will team together to build or drill the following key components:

- Eight offshore drilling, production, and living quarters platforms;
- Drilling and completion of 15 gas production wells;
- Twelve kilometers of 16 inch diameter intrafield pipelines;
- A 93 kilometer, 32 inch pipeline from the field to the LNG plant;
- Two identical 366 tons per hour capacity LNG trains;
- A 93 MW gas turbine power generation facility;
- Three 140,000 cubic meter LNG storage tanks; and
- Three 58,000 cubic meter condensate storage tanks.

However, Standard & Poor's has concluded that Mobil and QGPC have structured this project such that the financial and completion risks associated with construction that lenders could assume is minimal at the 'BBB+' rating level. Several features of the construction program support this conclusion:

- The project relies strictly upon commercially proven, current technology;

- The primary LNG contractors, JGC and MW Kellogg, together have the most LNG EPC experience in the world;
- The offshore EPC contractors, McDermott-EPTM and Saipem, are among the largest and most experienced marine contractors worldwide;
- Mobil, as one of the world's largest oil and gas exploration and production companies, brings some of the best oil field drilling experience to the project;
- Construction contracts all have fixed-price, date-certain, turnkey provisions that also provide 5% liquidated damages, performance acceptance tests and two-year warranties; and
- The project sponsors have guaranteed to repay lenders in total if the project is not completed on schedule and as designed by the project completion date.

Proven Technology and Vendors

Offshore facilities. The offshore facilities, which are designed for a 30-year life, should be sufficient to reliably provide the onshore LNG facility with the 1,000 MMCFD natural gas requirements. A number of redundancies in the infield pipelines and wellhead platforms permit the project to lose a platform's production capability and not affect the LNG plant. According to Stone & Webster, the independent engineer, the designs for the facilities conform to industry practices and Mobil's considerable worldwide experience, which has spanned most of this century.

The water depth of 66 meters and the 93 kilometer distance from shore pose no unusual problems to offshore construction. Offshore construction challenges, such as deep water and the hostile environment of the North Sea or unstable sea floor bottoms of the Gulf of Mexico, do not exist in the Persian Gulf. The relatively calm waters, predictable weather, and the results of the preliminary geotechnical investigations suggest a construction program with minimal delays and risks.

In its selection of McDermott-EPTM, Ras Laffan has selected one of the most noted offshore EPC contractors in the oil and gas industry. J.

Ray McDermott, the Houston based engineer contractor, is the world's largest marine contractor with decades of experience. It has about 20% of the platform market share and 45% of the offshore installation market. EPTM International AS (EPTM) is an international French marine and pipeline contractor. Saipem, the subsea pipeline contractor, has over 45 years of contractor experience in the oil and gas industry and one of the larger marine construction fleets.

Certain risks to the offshore program do exist, such as:

- Corrosion problems concerning the critical, nonredundant systems and components, such as the 93 kilometer pipeline to the onshore facilities;
- The intricate installation of the production process, platform deck, whose dry-weight exceeds 5,300 tons;
- The installation of the wellhead decks;
- The potential for fires and explosions that the simultaneous operations of drilling and production present; and
- The integration of numerous production equipment components into a single operational system in an offshore, marine environment.

However, based on a review of the documents, the preliminary designs, key contractor reputations, Mobil's extensive and exhaustive planning for this project, and Mobil's offshore experience, Standard & Poor's and Stone & Webster have concluded that the project sponsors have adequately mitigated these design risks through the best available design practices.

Onshore facilities. As with the offshore facilities, Ras Laffan has designed the LNG plant and its supporting components to have a 30-year life. The plant is designed to accept 51,000 kilograms per hour of natural gas and condensate feedstock. The plant will produce the following products for sale:

- LNG
- Condensate
- Sulfur by-products

A complicated system, the LNG train integrates the following processes and equipment:

- An inlet facility to receive the offshore supplied feedstock,
- An acid gas removal and collection process,
- Gas dehydration equipment,
- Gas chilling and liquefaction equipment, and
- Refrigeration and refrigerant preparation equipment.

In addition, supporting onshore facilities include almost 100 MW of gas turbine power generation, two 140,000 kilogram per hour steam producing boilers, a fresh water desalination system, LNG and condensate storage

Table 4
LNG EPC Contractor Joint Venture Experience

Project	JGC	Start-up	Project	MW Kellogg LNG	Start-up
Bonny Island, Nigeria		1999			
Malaysia LNG DUA Exp		1996	Oman LNG		1997
			Malaysia LNG DUA Exp		1996
Woodside, Australia		1992	Nigeria		1994
Woodside, Australia		1989	Woodside, Australia		1992
			Woodside, Australia		1989
			Qatargas		1992
			Malaysia		1989
Pertamina Arun, Indonesia		1986			
Malaysia LNG DUA, Sarawak		1984	Malaysia LNG DUA, Sarawak		1984

tanks, fire protection and fighting facilities, and supporting utilities.

LNG projects also need specialized LNG loading facilities for the LNG and condensate tankers. LNG loading facilities are generally large civil works projects, which can pose construction risk, particularly concerning scheduled completion dates. For Ras Laffan this risk does not exist. The project greatly benefits from the existence of the Qatargas project's having already built the berthing facility that Ras Laffan will share. This facility, which includes a five kilometer plus long jetty, cost nearly US\$1 billion to construct and is already in use. The loading berths have the capacity to simultaneously service up to five tankers with differing capacities of 135,000 cubic meters, 125,000 cubic meters, and 70,000 cubic meters.

As with the offshore facilities, Ras Laffan has selected an EPC team with some of the best LNG construction experience in the world. JGC, a Japanese contractor founded in 1928, has executed over 10,000 projects in the refining and petrochemical sectors, one of which is the recently completed 1 million ton per day Umm Said plant in Qatar. MW Kellogg, a U.S. company founded at the beginning of the century, was involved in three of the four grassroots LNG projects built between 1976 and 1995. Table 4 summarizes the LNG EPC and front-end design experience of the two firms.

Based on the contractors' experience and Stone & Webster's opinions that the onshore facilities are well conceived and thought out in design, Standard & Poor's has concluded that construction design risk is minimal.

Schedule and Budget Obviously a project of Ras Laffan's magnitude potentially presents construction delay risk to lenders. In the past, mega-energy projects, such as the pioneer energy plants of the 1970s and early 1980s, experienced legendary cost-growth and schedule delays. However, LNG plants, especially in the past few years, have not experienced these problems. Ras Laffan has virtually eliminated cost growth and schedule risk delay to bondholders through the following mitigating strategies:

- Contracts are fixed-price, turnkey, date certain;
- Financing documents limit Ras Laffan's ability to change scope of work without lender approval;
- EPC contracts by April 1, 1996, were awarded for onshore construction, offshore platforms construction, and offshore pipelines construction;
- During 1995 and 1996 Ras Laffan placed all of the orders for the long lead process items;
- Site civil construction work is already in progress;
- Through Sept. 30, 1996, shareholder capital funds expensed are \$265 million and year-

end expenditures should total about \$400 million; and

- If the project does not attain completion of the first train by March 2001, Mobil and QGPC must refund loans to lenders.

Finally, Stone & Webster has opined that irrespective of whether Ras Laffan chooses the one or two train option, no reason exists as to why Ras Laffan can not meet the milestones stated within its overall master schedule. The schedules and activities are in-line with industry experience for LNG installations. Standard & Poor's generally agrees with Stone & Webster's assessment but acknowledges that completing the project will in part rest with the abilities of all parties involved, including Mobil, to tightly manage the details. Mobil has mitigated this risk by assigning very capable LNG personnel, who got their experience with Mobil's Indonesian projects, to this project.

That project costs could exceed budget costs is remote, largely due to the fixed-price, turnkey contracts. A comparison of Ras Laffan's budgeted costs suggests that compared with other LNG projects (about US\$1 billion per 1 MMTA), this project should be built more cheaply (see table 5). This is largely attributable to the fact that the major EPC contracts were bid tightly at a time when contractors had significant idle capacity. Conceivably, the potential exists that contractors may put pressure on Ras Laffan for more profitable change orders during construction or that contractors may have to absorb costs that could undermine their effectiveness. However, this does not seem to be a significant risk to the project or to the overall financial viability of the contractors.

Table 5
LNG Construction Budget (US\$ Mil.)

Budget item	Single train	Two train
Drilling	199	266
Offshore facilities	413	469
Onshore facilities	1,315	1,711
Venture costs	290	308
Total costs	2,217	2,754

Overall the project could be subject to certain unforeseen EPC cost increases that could be difficult to avoid including:

- Owner-requested changes in design,
- Changes in the EPC scope as infrastructure requirements become better defined,
- Changes in Qatari laws and/or tax requirements, and
- Interface problems among the three main contracts.

It is unlikely that increases in construction costs could adversely affect bondholders or other lenders. The partners would generally have to fund increased capital costs through additional equity contributions. Moreover, sensitivity analyses of a 5% capital cost and per-

PROJECT FINANCE ANALYSIS

Table 6
Ras Laffan Pro Forma Cash Flows Through 2006: One Train Case
(Nominal US\$ Mil.)

	2000	2001	2002	2003	2004	2005	2006
Revenue							
LNG	376.3	387.5	399.2	411.1	423.5	436.2	449.3
Field condensate	87.1	90.4	94.1	97.3	99.6	102.8	105.8
Plant condensate	12.4	12.8	13.4	14.0	14.6	15.3	16.0
Sulfur	1.9	2.0	2.0	2.1	2.1	2.2	2.2
Total operating revenue	477.7	492.8	508.7	524.5	539.7	556.5	573.3
Expenses and interest income							
Less total royalties	90.6	93.4	96.3	99.2	102.2	105.3	108.5
Less operating expenses	105.2	117.3	114.0	120.1	131.0	126.4	130.1
Plus interest income	4.7	9.9	10.1	9.9	9.7	9.4	9.1
Less precompletion cash	67.9	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow for debt	218.6	291.9	308.5	315.1	316.3	334.1	343.8
Annual debt service							
Principal	0.0	36.4	72.7	72.7	72.7	72.7	72.7
Interest	72.8	97.0	92.8	87.3	81.7	76.1	70.6
Total annual debt service	72.8	133.4	165.6	160.0	154.4	148.9	143.3
Debt service coverage ratio	2.98	2.17	1.86	1.96	2.04	2.24	2.39
Debt service reserve account	0.0	48.5	83.5	80.7	77.9	75.1	72.3
O&M reserve account	0.0	35.1	35.0	36.5	38.9	38.6	39.8
O&M—Operating and maintenance.							

manent operating expense increase results in only a nominal 2 basis point lowering (from the base case) in the minimum DSCRs. For the two train case, a 4% increase in capital costs and a 10% increase in operating expenses results in a 4 basis point lowering of the minimum DSCR against the base case. Most, if not all of the effects on debt service coverage are attributable to increased expenses, not capital increases.

Payment Approval, Performance Tests, and Warranties
The financing documents require that an independent consultant sign off on work completed and submitted for interim payment.

The EPC contracts generally protect both Ras Laffan and lenders from the risk that construction problems resulting from performance below design could affect cash flow and debt service. The three major contracts provide the following:

- Liquidated damages of up to 5% of each of the EPC contracts for schedule overruns;
- Liquidated damages for failing to meet guaranteed LNG capacity up to 5% deficiency—beyond 5% contractor must remedy the situation to meet design specifications;
- Strictly defined mechanical and operational acceptance tests;
- Seventy-two hour performance tests;
- Two-year warranties that facilities will conform to final Ras Laffan approved plans and specifications: warranties are extended for amount of time equipment is not in service and warranties for reperfomed work expires 12 months after the original warranty period expires; and
- A six month certificate test that certifies contractual specifications have been met—fail-

ure to achieve this test would trigger loan guarantee repayment.

Stone & Webster noted that while the EPC contract provides liquidated damages, the amounts tend to be on the lower end of what they consider acceptable; liquidated damages would not, for instance, compensate Ras Laffan for lost revenue or interest payments. Lender risk, however, is mitigated more by the Mobil and Qatar completion guarantees.

Operations and Availability The long-term risk that the Ras Laffan plant will not be available to produce the amount of LNG needed for contractual purposes seems minimal. The facility relies upon commercially proven technology and Mobil's operations staff has a proven record of operating LNG plants successfully. The plant design basis and performance projections rely upon the plant achieving an 85% capacity factor, which is equivalent to running for 310 days per year at full output. Stone & Webster has concluded that the onshore facility should be able to achieve the 85% capacity factor. In addition, some flexibility exists in that the plant is actually designed for 2.6 MMTA output, but only 2.4 million tons, 92% of nameplate capacity, are needed to service the Kogas SPA. In other words, servicing the Kogas SPA will only place a 78.2% load factor on the facility.

PURCHASER'S CREDIT STRENGTH PRESENTS THE LEAST RISK TO THE PROJECT

The credit strength of Kogas presents one of the lowest risks to the project. While Standard & Poor's does not have a public rating on Kogas, lenders have the comfort in that the Republic of Korea owns 50% of Kogas and Kepco owns 34.7% of Kogas. Regional Korean governments own the remaining 15.3% of Kogas. All of Kogas' owners have an economic stake in seeing that Kogas is financially able to honor its obligations to Ras Laffan. Kepco, for instance, needs to insure that Kogas has a reliable and continuous supply of LNG, since Kepco needs the natural gas for power generation. Similarly, the regional governments also need to insure that they will have a reliable supply of natural gas. Finally, as the Republic of Korea has embarked on a program of greatly expanded LNG consumption, as evidenced by Korea's US\$7 billion LNG infrastructure investment program, it would risk idling its investment if Kogas could not honor its obligations, to say nothing of the internal political turmoil that the resulting energy crisis might cause.

Several other factors support Kogas' credit strength:

- Kogas is planning LNG infrastructure investments of about US\$1.2 billion per year through 2000;
- Long-term plans include adding six loading berths and 53 storage tanks by 2010;
- LNG demand growth in Korea has grown at annualized 20% per year since 1987 and

Table 7
Ras Laffan: One Train Break-Even Analysis Results

	2000	2001	2002	2003	2004	2005	2006
(\$/bbl equivalent)							
LNG floor price	17.83	18.53	19.29	20.12	21.02	21.98	23.02
Break-even price	15.00	16.05	16.25	16.15	16.30	15.75	15.60
Break-even floor price margin	2.83	2.53	3.04	3.97	4.72	6.23	7.42

Kogas expects demand to continue to grow at 7% annually; and

- Kogas' regulators in the past have generally approved all natural gas tariff increases requested by Kogas.

Finally, as a consumer of LNG, Korea, like other major LNG importers in other countries, has few alternatives for LNG supplies. Hence, it is in Korea's economic interest to ensure that Ras Laffan remains capable of covering its operating costs. The record of other LNG importers over the past couple of decades would seem to support this assertion.

FINANCIAL STRENGTH MINIMIZES DEFAULT RISK

Project *pro formas* support the notion that the SPA should provide Ras Laffan with highly predictable and quality revenues; quality being measured by minimal deviation in price and LNG volumes delivered. In addition to contract LNG revenues, Ras Laffan receives revenues from sales of condensate and sulfur at market prices.

The *pro forma analysis* relies on the following assumptions:

- Operating costs assumed to inflate at 3% per year;
- LNG will be sold at the contract minimum floor price, which is equivalent to approximately US\$18.60 (1996) per barrel crude oil price escalated at 3% per year—hence upside

potential exists compared to base case—current oil prices are about 30% higher than base case assumptions;

- Condensate will clear at the Asia/Pacific region's refinery feedstock price with parity discounts to adjust for Ras Laffan's higher sulfur content;
- The project has no exposure to foreign currency as all transactions are conducted in U.S. dollars;
- The State of Qatar receives a condensate royalty equal to about 9% of sales; and
- The State of Qatar receives a royalty on the wellhead stream of gas delivered to the LNG plant at a price indexed to the LNG price with a minimum price of US\$0.50 per MMBTU.

The *pro forma analysis* (see table 6) indicates the following:

- Even without market price sales of condensate and sulfur—an extraordinarily unlikely situation, mitigated by sponsor guarantees to purchase the condensate—Ras Laffan's LNG sales generate sufficient cash for debt service;
- Basing the analysis and financing on the LNG floor price, instead of the forecast market price, introduces a margin of conservatism to LNG revenues; and
- The lowest DSCR, 1.79, occurs in the 14th year, but annual DSCR nearly exceeds 2.0 through 2009.

Break-even Analysis A break-even analysis for the one train case further indicates that lenders enjoy a certain comfort margin over both the floor price and the forecast market price. This further supports the notion that the Ras Laffan project should exhibit predictable and quality cash flows. The margin of safety between operating costs and the contract LNG floor price increases from about 12% in 2000 to about 30% by 2006 (see table 7).

Debt Service Coverage Sensitivity Sensitivity analyses performed by Stone & Webster support the conclusions that Ras Laffan's cash flows should be predictable and reliable throughout the term of the senior debt. Even the most extreme and unlikely cases where the LNG price goes below the contract floor prices indicates adequate cash flow needed to service debt.

If Ras Laffan elects to build the second LNG train, Ras Laffan would probably increase debt leverage with slightly lower minimum debt service coverage levels. However, the indenture loan life coverage ratio would increase (see table 8).

Table 8
Sensitivity Analysis Results: Ras Laffan One And Two Train Cases

Sensitivity Analysis Results: Has Larion One And Two Train Cases			
Case	Description	Minimum DSCR	Indenture loan life coverage ratio
One Train Case			
Base	Base case at the minimum floor price	1.79	2.31
1	5% increased capital and operating expenses	1.77	2.26
2	10% reduction to minimum floor price	1.59	2.04
3	Price reduced below floor at \$15/bbl (1996); escalated at 2.0% per year	1.07	1.54
Two Train Case			
4	Base case at the minimum floor price	1.55	2.49
5	4% increased capital and 10% increased operating expenses	1.51	2.44
6	10% reduction to minimum floor price	1.38	2.23
7	Price reduced below floor at \$15/bbl (1996); escalated at 2.0% per year	1.16	1.74
8	LNG sales volume reduced to 3.8 MMTA	1.55	2.27

RAS LAFFAN CONTRACTS, FINANCING DOCUMENTS, AND QATARI LAW

Overview Standard & Poor's is unique in its policy that the "legal" aspects of a transaction—primarily the provisions and interpretation of project and financing documents, the objects and effects of transaction structure, and the influences of the different legal regimes in contact with the transaction—merit close analytical attention. The expressed intent of transaction parties (as compared to past practice and transactional "norms") must be viewed in light of legal enforceability—the ability and willingness of a court operating in a particular legal system to correctly interpret the nature of the parties' agreement and to require them to abide by the terms of that agreement. The size and complexity of the Ras Laffan transaction makes its legal analysis particularly pertinent.

Legal Review of the Ras Laffan Project While large scale natural-resource and infrastructure facilities are not uncommon to the Middle East, capital market financings of such facilities are decidedly rare. To narrow the field further, the capital-market "project" financing of such a facility (in which offtake contracts and the facility and its support arrangements are the sole extent of investors' recourse) appears to be unique to the Ras Laffan transaction.

"Project" aspects of the transaction are reflected in the structural aspects of the transaction. These structural aspects are modified by the dictates of Qatari law and procedure, which chiefly show themselves in the unusual collateral arrangements constituting a portion of the security package. Extensive export credit agency (ECA) involvement on the lending side of the transaction has complicated the logistics of intercreditor arrangements. However, the financing is not overly burdened by the legal and structural indeterminacies posed by accommodating tax concerns and accounting treatments—the Qatari government has granted the transaction a 12-year tax holiday.

Transactional features, while complex, at heart reflect certain simple facts: a vast facility comprised of a large number of purpose-built, state-of-the-art achievements in civil, mechanical, marine, and petroleum (to name a few) engineering supplied by a wide range of international contractors is being built and financed in a legally unsophisticated jurisdiction in which the concepts of "pledge", "lien", and "mortgage" are unfamiliar novelties, at a price compelling the involvement of hundreds of bank and institutional lenders (with or without ECA patronage) and their traditional allies and opponents—capital markets investors.

Project Structure The issuer and project owner, Ras Laffan Liquefied Natural Gas Co. (Ras Laf-

fan), is a Qatari joint stock company 70% owned by Qatar General Petroleum Co. (QGPC) and 30% by Mobil QM Gas Inc. (Mobil). Mobil is a direct, wholly owned subsidiary of Mobil Corp. while QGPC is a state-chartered corporation wholly owned by the State of Qatar. Prior to the financial closing of the transaction, Mobil and QGPC are expected to evidence their respective ownership interests in Ras Laffan through their holding of Series A shares. Series B shares (aggregating a 7% overall interest in Ras Laffan) are being sold to two Japanese trading companies, Itochu Corp. and Nissho Iwai Corp. The Series B shareholders will be authorized to participate in certain sales of liquefied natural gas (LNG) to Japanese buyers.

The involvement of both Mobil Corp. and the Qatar sovereign (the parents) is a prominent feature of the transaction. Land use rights for the project have been contributed by the Qatar sovereign to QGPC which in turn has contributed such rights under a *Land Lease* to Ras Laffan. Moreover, while nominally nonrecourse, the transaction relies on various *Guarantees* from the parents in favor of The Industrial Bank of Japan Trust Co., as security trustee (Security Trustee). These *Guarantees* are not joint but several (in other words, each guarantor is only pro rata liable) and are premised on the extent of the respective indirect ownership proportions of the parents. The parents have guaranteed project completion, certain equity contributions or subordinated loans to Ras Laffan, and certain offtake obligations by QGPC and Mobil under *Condensate Sale and Purchase Agreements* with Ras Laffan. QGPC and Mobil have themselves severally guaranteed project completion. The *Guarantees*, which are governed by New York law, comply with Standard & Poor's criteria for payment and performance guarantees.

Both Ras Laffan and the project are outgrowths of the *Development and Fiscal Agreement* (DFA) between the State of Qatar and QGPC, Ras Laffan, and Mobil. The DFA grants development and exploitation rights to the venture (and favorable tax treatment) in exchange for royalty payments. As the legal foundation of the transaction, the DFA was specifically ratified by Emiri decree. The parties to the DFA are excused from performance upon the occurrence of certain *force majeure* events. Extensive detail regarding the rights and obligations of the principals in connection with the project is provided by the *Joint Venture Agreement* between QGPC and Mobil, which sets out the terms of their respective involvements in the Ras Laffan joint venture; the *Project Services Agreement* between QGPC and Mobil Qatar Management & Technical Services Inc. (Mobil QM&TS) by which the parties furnish technical expertise, engineer-

RAS LAFFAN CONTRACTS, FINANCING DOCUMENTS, AND QATARI LAW

Overview Standard & Poor's is unique in its policy that the "legal" aspects of a transaction—primarily the provisions and interpretation of project and financing documents, the objects and effects of transaction structure, and the influences of the different legal regimes in contact with the transaction—merit close analytical attention. The expressed intent of transaction parties (as compared to past practice and transactional "norms") must be viewed in light of legal enforceability—the ability and willingness of a court operating in a particular legal system to correctly interpret the nature of the parties' agreement and to require them to abide by the terms of that agreement. The size and complexity of the Ras Laffan transaction makes its legal analysis particularly pertinent.

Legal Review of the Ras Laffan Project While large scale natural-resource and infrastructure facilities are not uncommon to the Middle East, capital market financings of such facilities are decidedly rare. To narrow the field further, the capital-market "project" financing of such a facility (in which offtake contracts and the facility and its support arrangements are the sole extent of investors' recourse) appears to be unique to the Ras Laffan transaction.

"Project" aspects of the transaction are reflected in the structural aspects of the transaction. These structural aspects are modified by the dictates of Qatari law and procedure, which chiefly show themselves in the unusual collateral arrangements constituting a portion of the security package. Extensive export credit agency (ECA) involvement on the lending side of the transaction has complicated the logistics of intercreditor arrangements. However, the financing is not overly burdened by the legal and structural indeterminacies posed by accommodating tax concerns and accounting treatments—the Qatari government has granted the transaction a 12-year tax holiday.

Transactional features, while complex, at heart reflect certain simple facts: a vast facility comprised of a large number of purpose-built, state-of-the-art achievements in civil, mechanical, marine, and petroleum (to name a few) engineering supplied by a wide range of international contractors is being built and financed in a legally unsophisticated jurisdiction in which the concepts of "pledge", "lien", and "mortgage" are unfamiliar novelties, at a price compelling the involvement of hundreds of bank and institutional lenders (with or without ECA patronage) and their traditional allies and opponents—capital markets investors.

Project Structure The issuer and project owner, Ras Laffan Liquefied Natural Gas Co. (Ras Laf-

fan), is a Qatari joint stock company 70% owned by Qatar General Petroleum Co. (QGPC) and 30% by Mobil QM Gas Inc. (Mobil). Mobil is a direct, wholly owned subsidiary of Mobil Corp. while QGPC is a state-chartered corporation wholly owned by the State of Qatar. Prior to the financial closing of the transaction, Mobil and QGPC are expected to evidence their respective ownership interests in Ras Laffan through their holding of Series A shares. Series B shares (aggregating a 7% overall interest in Ras Laffan) are being sold to two Japanese trading companies, Itochu Corp. and Nissho Iwai Corp. The Series B shareholders will be authorized to participate in certain sales of liquefied natural gas (LNG) to Japanese buyers.

The involvement of both Mobil Corp. and the Qatar sovereign (the parents) is a prominent feature of the transaction. Land use rights for the project have been contributed by the Qatar sovereign to QGPC which in turn has contributed such rights under a *Land Lease* to Ras Laffan. Moreover, while nominally nonrecourse, the transaction relies on various *Guarantees* from the parents in favor of The Industrial Bank of Japan Trust Co., as security trustee (Security Trustee). These Guarantees are not joint but several (in other words, each guarantor is only pro rata liable) and are premised on the extent of the respective indirect ownership proportions of the parents. The parents have guaranteed project completion, certain equity contributions or subordinated loans to Ras Laffan, and certain offtake obligations by QGPC and Mobil under *Condensate Sale and Purchase Agreements* with Ras Laffan. QGPC and Mobil have themselves severally guaranteed project completion. The Guarantees, which are governed by New York law, comply with Standard & Poor's criteria for payment and performance guarantees.

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and any other permitted owner, and certain other conditions. The Project Coordination Agreement also contains various representations and warranties by Ras Laffan in favor of the senior lenders, various covenants in favor of commercial banks and ECAs (not Bondholders) and events of default. Nevertheless, the Bonds and the Indenture are crossdefaulted to the Project Coordination Agreement.

It is perhaps worth noting that this transaction features the expected participation by some five ECAs (the British ECGD, the French COFACE, the Italian SACE, U.S. EXIM and JEXIM are, through their representatives, parties to the Project Coordination Agreement) and an independent consortium of commercial banks. In Standard & Poor's experience, this level of ECA involvement has never occurred in a rated transaction.

The Bonds. Ras Laffan will issue the Bonds pursuant to a Trust Indenture (Indenture) with Bankers Trust Co. as Bond Trustee. While the Indenture provides for events of default and the exercise of remedies, these provisions are constrained by the provision of the collateral security agreements, primarily the Intercreditor Agreement, the Collateral Agency Agreement, and the Security Trust Agreement. The Indenture provides for optional redemption at the option of the bondholders under certain specified conditions (primarily for failure to complete the project or in certain events of default), at the option of Ras Laffan at any time with redemption premiums. The Bonds are subject to mandatory redemption from certain casualty or excess insurance proceeds, or from certain excess moneys.

The Indenture does not appear to be "qualified" under the Trust Indenture Act of 1939.

Security. As security for the Bonds, the obligations under the ECA and commercial bank facilities, and for any advances made under any interest rate hedges arising out of the ECA and commercial bank facilities, Ras Laffan will, pursuant to a Security Agreement with The Industrial Bank of Japan Trust Co., as Security Trustee, grants a security interest in certain "Shared Collateral" (comprising the Project Documents (as defined above), insurance policies, governmental authorizations and approvals that are permitted to be assigned, project revenues, produced natural gas and gas products, personal property, contract rights, accounts, moneys, and proceeds of the foregoing). The Shared Collateral is "perfectible" under New York law, but does not constitute any of the tangible assets of the project plant.

Qatari law, at present, cannot effectively contemplate the creation of a security interest in the tangible assets of the project plant. The

creation of an interest in such collateral is therefore dealt with by means of a conditional transfer arrangement initiated under the Asset Transfer Agreement (governed by Qatari law) between (among others) Ras Laffan, and a specially-created Cayman Islands entity named Ras Laffan Holdings LDC (Holdings). Roughly stated, the intent of the mechanism is to assign absolutely all of Ras Laffan's on-shore and offshore assets, vehicles and other tangible assets, as well as its leasehold interest under the Land Lease (Cayman Collateral) to Holdings. Holdings then pledges the Cayman Collateral to the Security Trustee under a separate Security Agreement (governed by New York law) with the Security Trustee, while conditionally transferring such collateral back to Ras Laffan subject to the terms and conditions of the Security Agreement. In this fashion, Ras Laffan attempts to grant the Security Trustee a "complete" collateral package. Standard & Poor's has been advised that the conditional transfer arrangement has been previously employed in the financing of the Qatargas LNG Project. While novel, the method has apparently been ratified by an Emiri decree on the subject. Nevertheless, the arrangement is untested by either the New York or Qatari courts and is unlikely to be tested absent a default. Even if the arrangement were determined by a New York court to vest the Security Trustee with a perfected lien, however, the likelihood of a Qatari court following such a determination cannot be predicted. The efficacy of the conditional transfer procedure is, therefore, open to question.

Ras Laffan has also entered into a Security Trust Agreement with the Security Trustee and Credit Suisse, as Intercreditor Agent establishing various accounts for bond proceeds, project revenues and proceeds and denotes the application and priority of those funds. The Intercreditor Agreement governs the rights and remedies of the senior lenders in respect of all collateral held by the Security Trustee. Intercreditor arrangements are supplemented by the Collateral Agency Agreement, which authorizes the Security Trustee to administer the project collateral, exercise remedies under the supervision of the Intercreditor Agent, and to apply the proceeds. The Intercreditor Agreement limits the exercise of remedies (including acceleration) subject to the vote of all senior lenders. It is possible, therefore, that Bondholders may not be able to exercise remedies in the event of a payment default. In the event that the collateral is foreclosed upon, the Preemption Agreement allows the Qatar sovereign a right of first refusal for the project.

There are a number of other security documents which add to the collateral package; these agreements relate chiefly to the obliga-

tions of QGPC and Mobil and other owners of Ras Laffan to make additional investments in the project.

Other Qatari Law Matters Several years ago, a Pakistani court caused the world's legal and banking circles to reverberate when it invalidated a contractual provision for the payment of interest as being contrary to Islamic law. While this ruling does not appear to have been followed in other Islamic countries, the specter of invalidation clearly haunts other transactions in which the borrower is either a Muslim or is subject to Islamic jurisdiction. Moreover, notwithstanding "choice-of-law" clauses to the contrary, the ability to ultimately realize upon much of the collateral will depend upon the Qatari courts.

The State of Qatar, a constitutional monarchy, adopted its Provisional Constitution in April 1972. That constitution, its first and only, provides for rule by an Emir who, assisted by the Council of Ministers, oversees state policy and promulgates legislation, usually by decree.

The Provisional Constitution establishes the judiciary as an independent constitutional authority. The Qatari judicial system divides the courts into civil and Shari'a jurisdictions. Civil courts, which operate under the Ministry of Justice, have jurisdiction over commercial proceedings. The Shari'a courts, which function under the Presidency of the Shari'a Courts and Religious Affairs, have jurisdiction over religious, inheritance and familial matters among Muslims. The judicial division appears to be a relatively recent one. Under Law #13 of 1990, the jurisdiction of the civil and

commercial courts specifically encompasses the resolution of commercial disputes. Standard & Poor's is advised that disputes arising out of the Ras Laffan transaction would be referred to the civil courts on two independent grounds: (i) as the transaction is of a commercial nature, it is exempt from Shari'a jurisdiction and (ii) as the transaction parties are not exclusively Muslim, the civil courts are alone empowered to hear any dispute. Standard & Poor's is also advised by Qatari counsel that the distinction between the civil courts and the Shari'a courts is routinely affirmed by each such court.

Standard & Poor's understands from Qatari counsel that the civil courts look to the intent of the parties as expressed through contract and to statutory law as the primary means of determining the legality of their business arrangements (custom and Shari'a law in the absence of statutory authority). Standard & Poor's also understands from counsel that the Qatari civil and commercial code will enforce provisions for the payment of interest in banking transactions. Standard & Poor's has also been advised that the Ras Laffan transaction would be properly viewed by the civil courts as a "banking" transaction and that contractual interest provisions would be awarded to the date of judgment. Post-judgment interest is payable at a rate equal to 5% per year. There is no usury defense in Qatar.

In addition to the routine legal opinions Standard & Poor's requests in project finance transactions, it has requested that counsel confirm the legality of the payment of interest as well as the legality of the conditional transfer arrangement.

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