By George Tappan

On March 31, 1992, Argentina opened the first of three rounds of competitive bidding during which 145 exploration permits were offered to national and international companies. The first round, which closed June 30, 1992, pertains to onshore areas in southern Argentina. Northern Argentina areas will be offered in the second round which opened May 4 and closes August 31, 1992. The third round, June 1-October 30, 1992, will cover offshore areas.

Areas remaining after Round III will be offered in Round IV, October 30-December 31, 1992, and Round V, January 1-March 1, 1993.

Commercial production was first established in Argentina in 1907. By 1930 the industry was controlled by the state oil company, which by 1959 built production up to about 120 MB/D. In 1962 Argentina opened its doors again to outside industry and a dramatic production increase followed, to about 275 MB/D that year. Argentina’s all-time high, established in January of this year, was 575 MB/D.

**Fiscal Basis:**

In 1985 Argentina introduced the “Houston Plan” to attract foreign investment in the oil industry. This was followed by several decrees concerning deregulation of the industry, privatization of the state oil company, Yacimientos Petroleros Fiscales (YPF), and relinquishment of marginally producing or undeveloped areas held by YPF. Following the success of the Houston Plan, Decree No. 2178, “Plan Argentina” was issued in October 1991, and with the Hydrocarbon Law and subsequent decrees, is the present fiscal framework of operation for foreign companies.

An Exploration Permit is issued for a maximum of three exploration periods. The time increment and work program for the First Exploration Period (FEP) are to be proposed by the operator in the bid. No commitment is required in the bid for the second and third periods, but each carries an obligation to drill. The Exploration Permit can be converted to a Production Concession at any stage in the event of a commercial discovery. There is no government equity or participation, and no obligation to supply the domestic market. The operator is also free to dispose of production as he chooses, and is not subject to exchange rate controls.

A 12% royalty on gross revenue, less transportation cost to point of sale, is payable to the Provincial government. Provincial governments also apply a 1.2% sales tax to gross revenue after royalty. Both royalty and sales tax are deductible for calculation of profit tax paid to the national government. Profit tax (income tax) is 36% on taxable income of subsidiaries of foreign companies and 20% on national companies. Operating costs and the costs of dry exploratory wells and seismic acquisition are expensed. Development costs are depreciated. A 1% tax is levied on tax-valued assets, including exploration and production expenditure, which are fully capitalized. An 18% value-added tax is applied to sales of goods and services but does not apply to exports. A consumer tax at point of sale does not apply to industrial users.

**The Sedimentary Basins:**

The 145 blocks offered under “Plan Argentina” are distributed in 14 distinct basins over mainland Argentina, the Argentine half of Tierra del Fuego, and the Atlantic shelf. Six of the basins produce. Most have seen some exploration activity. A few have not.

The Argentine basins are distinguished in three major groups according to their origin: the Paleozoic/Mesozoic basins in the north, built on Paleozoic and older terrane, the
younger-southward backarc basins of western central and southern Argentina, formed during successive pulses of progressive terrane accretion, and the Atlantic basins related to the South Atlantic rift system.

The Puna and Oran Basins are part of the broad Cretaceous foreland basin developed on Paleozoic basement and subsequently restricted by Andean compression. The main producing interval is a Maastrichtian-Paleocene shallow marine transgressive carbonate-sand-shale sequence. An Early Cretaceous tuff also produces. Hydrocarbon source is thought to be from the marine Devonian. The Puna basin has no production as yet.

The immense Paleozoic Chaco-Parana Basin is characterized by broad, low-dip structures, a Devonian shale source, and reservoir potential in the Silurian and Permo-Carboniferous glacial sequences. It has no proven production, but a recent discovery in the Formosa region has provided encouragement.

The Cuyo, Balsones, and San Luis are fault-bound basins in a complex basement of Precambrian and Early Paleozoic meta-sediments, and Permo-Triassic volcanics. The basins are filled with thick non-marine Triassic and Tertiary clastics. A Triassic lacustrine shale is generally considered the source of the waxy oil, and although the Cretaceous is not well represented, Neocomian clastics and basalts are the principal reservoir and caprock. An oil-productive interval is also found in the basal Tertiary.

The Neuquen Basin is a Jurassic-Cretaceous depocenter that began to form as a back arc basin during Late Triassic. The basin fill consists of marine and non-marine clastics with some carbonates and evaporites. A thick series of carbonates, shales, and sandstones were deposited during Late Jurassic and Early Cretaceous, followed by Maastrichtian carbonates and Tertiary terrestrial clastics and volcanics. The major producing intervals are in Jurassic sands and Late Jurassic-Early Cretaceous carbonates, but production is also found elsewhere throughout the section. Late Jurassic black shales are the hydrocarbon source. Neuquen is the second most prolific basin in Argentina.

The Nirihau Basin is a Tertiary basin. Most plays are in the Miocene in structures developed during the Andean orogeny. No production has been established to date.

The San Jorge Basin, which produces about 175 Mb/d waxy crude and 290 MMcf/d gas, is Argentina's most prolific producing area. It was formed as a backarc basin during Late Triassic-Early Jurassic as a result of impingement and subduction of the Pacific plate, and later modified by Cretaceous strike-slip movements related to the opening of the Atlantic. The earliest basin fill, Late Triassic-Early Jurassic volcanics, was followed by Jurassic-Cretaceous clastics and Early Cretaceous dark lacustrine source shales. Late Cretaceous and Paleocene fluvial-deltaic clastics provide a complex of discontinuous reservoirs, sealed by latest Cretaceous and Early Tertiary transgressive shales. Mid-Tertiary uplift and erosion around the basin margin provided the final continental and shallow marine basin fill. An Early Tertiary tensional period, and mid-Tertiary compressional event provided abundant normal block fault structures and low-angle thrusts.

The Austral Basin is the southernmost, and youngest, of the Argentine backarc basins. The earliest sediment, a Late Jurassic-Early Cretaceous transgressive sand, accumulated in the lows and around the highs of a block faulted and eroded volcaniclastic terrane. This basal unit, together with the porous erosional surface of the underlying tuffaceous clastics, constitutes the main reservoir for hydrocarbons derived from an Early Cretaceous black shale that immediately overlies it. Basin subsidence continued well into the Tertiary, but only gas and very little oil have been found in younger Cretaceous or Tertiary reservoirs. All commercial production is on the shallow eastern margin platform, near the Atlantic coast and just offshore. This basin, known as the Magallanes Basin in Chile, is common to both countries, both on the mainland and Tierra del Fuego island.

The West Malvinas Basin lies between the mainland and the Malvinas Islands, and is separated from the Austra Basin by the northwest-southeast trending El Chico high. It consists of elastic fill on basement, and has the same source and trap types as the Austra Basin. It has not been fully investigated and has no production.

The North Malvinas, or San Julian Basin, consists of Cretaceous and Tertiary fill over early rift hosts. The seismic quality is poor and no wells have been drilled to date.

The Colorado, Valdez-Rawson, Claromeco, and Salado Basins probably all had their origins in early Atlantic rifting or rift-related transforms, and are filled with thick mid-Cretaceous and Tertiary clastics. The Colorado Basin has a Jurassic source rock that matured during Tertiary burial. Seismic quality is poor and many wells were drilled in questionable locations. The Claromeco Basin overlies a Permo-Carboniferous glacial-lacustrine source, and has a Late Cretaceous-Early Tertiary shale seal capping the elastic-filled rift. No commercially viable hydrocarbon accumulations have been found to date in any of the Atlantic, but there is still a lot of promise. In anticipation of eventual investigation into deeper water, higher risk plays, nine blocks are offered on the Atlantic shelf-slope margin.

Data Available:

A copy of the Bidding Conditions, containing instructions on the completion of bid documents and other requirements, is available from the Secretariat of Hydrocarbons and Mines for US$400. Its purchase is a precondition to purchasing the technical data package. A data package containing a regional report, a synthesis of the hydrocarbon potential of the blocks, maps, data room catalogue, and an English translation of the bid decree, has been prepared for each bid round. The packages are available on the opening day of each round for US$15,000 per company. Purchase of the package is a prerequisite for access to the data room. Purchasers of the data package may request an appointment to view the technical data in the data room. The appointment is limited to two days, but all the data may be photo-copied at cost, or purchased for US$90,000.

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