

## Petroleum Developments in South America, Central America, and Caribbean in 1972<sup>1</sup>

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**Abstract** This review presents information on 1972 petroleum developments in 29 countries and areas. Ten countries had petroleum production, which totaled 1,602,167,000 bbl (4,377,534 b/d). This was a decrease of 5.1% from the previous year, and the sharpest production decline for the Latin America/Caribbean region since World War II. Venezuela's production, by far the major component (73.6% of the 1972 total), was down a marked 9.2% (approximately 117,000,000 bbl, or 329,000 b/d), also a post-War record. Output for the other producing countries, collectively, was up about 7%. This latter performance reflects mainly a dramatic increase for Ecuador, where the important Oriente fields came on stream in May, plus significantly higher volumes for Bolivia and Trinidad, and small increases for Peru and Argentina. Production in Colombia was down considerably, and decreased slightly in Brazil and Chile.

Industry drilling decreased to 1,703 wells, 184 fewer than in 1971. Both development and exploration sub-totals were lower, by about 12 and 3%, respectively. Only Argentina drilled a significantly greater number of development wells over the previous year, and there were marked decreases in Chile, Colombia, and Venezuela. In exploration drilling, Venezuela reported a major increase to 64 wells, the highest in a decade; and Chile's effort was also decidedly up from recent years. Exploratory tests were sharply down in Argentina and considerably lower in Trinidad, compared with 1971. In all, exploration drilling is reported from 14 countries, including 5 which have no commercial production; but no new countries entered the producing ranks.

Party-months of geologic and geophysical field work increased moderately (1,023 versus 964) over the previous year, most notably in Peru, where burgeoning activity in the Oriente was up about 7½ crew-years from 1971. The overall effort for the principal methods was: surface geology, 190 party-months (212 in 1971); seismograph, 764 (671); gravity, 48 (53); and airmagnetometer 3 (5).

Wildcat effort on the Brazil continental shelf was maintained at the same high level of the previous 2 years, but no new discoveries are reported. The vigorous exploratory drilling of last year in eastern Ecuador and in eastern offshore Trinidad continued through 1972, but the success rate was considerably lower; major development programs for earlier discoveries were carried out in both of these areas.

The big disappointment in 1972 exploration drilling came in Venezuela's South Lake Maracaibo contract acreage, where all 10 tests by the 3 operators were apparently unsuccessful. Honduras saw its second year of offshore tests, and onshore Belize the first exploration drilling in several years; 3 wells in the former and 5 in the latter were abandoned, all essentially dry.

The more important acreage developments for the period were: (1) contracting of 5 additional major blocks to private companies, in northeastern Peru; (2) new petroleum legislation in Bolivia, enabling service-contract-type ventures, with the prospect that international oil companies will be returning to the scene; and (3)

major obligatory year-end acreage reductions by existing concessionaires in eastern Ecuador, and announced plans to open these areas to service- or association-contract offers. In Argentina, no firm bids were received for major blocks in several basins, offered under service-contract arrangements in early 1972.

### INTRODUCTION (Tables 1-4)

Oil output in 1972 from the 10 producing countries in the review area was 1,602,167,000 bbl, a decrease of 5.1% from the previous year (Table 1). As the largest producer by far (73.6% of the total), Venezuela dominates these statistics; and this sharpest decline in Latin American production since World War II reflects a 9.2% decrease in that country, also a post-War record. The level for the other producer countries, collectively, was up by about 82,000 b/d (30,000,000 bbl for the year) or 7%, but this was overshadowed by the 329,000 b/d (117,000,000 bbl) drop in Venezuela. The most significant increases came in Ecuador and Trinidad, where important new fields went on production (Table 2). Three of the major Texaco/Gulf discoveries in northeastern Ecuador came on stream in May, to reach approximately 220,000 b/d at year end and abruptly make Ecuador the second-ranking oil exporting country in Latin America. Two Amoco fields off eastern Trinidad also were opened during the first half of the year; building outputs, to 40,000 b/d in December, reversed a 4-year decline in the country's production. Bolivia's production was up 21%, to 44,000 b/d, marking further recovery from disrupted operations of 2 years ago; and especially significant for the country, gas production increased nearly 50% (to 121 Bcf), on inauguration in April of the export gas pipeline to neighboring Argentina. Oil production in Peru and Argentina increased 4.3 and 2.2%, respectively. Colombia production declined considerably (9.3%), and output

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was down somewhat in Brazil (1.9%) and Chile (2.8%).

The total of wells drilled was 1,703, down 184 from the previous year (Table 3). Development drilling decreased by 175 wells (about 12%), and exploration drilling by 11 wells (3%). These global figures mask some significant changes in the breakdowns for individual countries. Venezuela, typically accounting for about 1/3 of the development total, led the decline with 155 fewer outpost and field wells drilled. At the same time, the country reported a major increase in exploration wells, to 64, the highest in a decade. Chile likewise had a considerable decrease in development and increase in exploration wells. The latter included 6 tests off the west coast, the first drilling ever on the country's Pacific continental shelf. In Argentina, total drilling was nearly the same as in 1971; but the number of exploration wells was down about 25%, and development effort correspondingly up. Development drilling was off sharply in Colombia, from the modern peak reached in 1971. The number of exploratory wells in Trinidad was down considerably from the unusually high level of the previous year.

No new countries were added to the oil-producer ranks. First commercial production was proclaimed, in some quarters, for Guatemala; but Government offices closest to these developments have issued tempering statements, and it would appear that initial reports were overly optimistic.

Oil exploration or related activity is reported from 29 countries or areas in Latin America and the Caribbean. There were no reported petroleum developments in El Salvador.

Party-months of geologic and geophysical field activity are shown in Table 4. This work increased about 6% over 1971, almost entirely because of the intensifying land seismograph effort (approximately 140 party-months versus 50 in the previous year) on the growing number of major service-contract blocks in northeastern Peru. The historically large efforts of the state oil companies in Argentina and Brazil were essentially unchanged from last year, and so these countries continued to account for roughly half of the Latin America total. Activity was up moderately in Bolivia and Trinidad, and down somewhat in Colombia and Ecuador.

There do not appear to have been any outstanding new hydrocarbon discoveries in the review area during 1972. For the promising plays in eastern Ecuador and eastern offshore Trinidad, the vigorous wildcatting effort of the two

prior years continued, but was less successful. Further discoveries by Peru's state oil company, Petroperu, in the hitherto virtually untested northeastern part of the country, rightly received worldwide attention; but it seems too early to say whether any of these several widely separated finds represent giant fields. Chile reports a potentially significant gas test (8.5 MMCFD) in one of its Pacific offshore wildcats.

Brazil's ambitious continental-shelf effort continued, with 8 exploration and 2 development rigs active at year end, 8 wildcats drilling, and 29 new-field and 2 extension wells spudded and completed during the year. Total exploratory drilling on the shelf since 1968 now stands at 84 completed wildcats and 29 extension wells. There are no indications that any truly major accumulations have yet been established in the Brazil offshore. The state oil company Petrobras reports proved reserves on the shelf as approximately 20 million bbl. First pipeline production from the offshore was expected in April 1973, at the rate of about 20,000 b/d from 3 development platforms in the Guaricema field.

The year's greatest disappointment in exploration drilling probably came in Venezuela's South Lake Maracaibo contract acreage. The first 10 tests (6 officially abandoned and 4 technically suspended) by the three operators, 9 of these in the range 15,800-18,000 ft, were apparently unsuccessful; and further results announced in early 1973 are likewise discouraging. Wildcats were completed in 5 nonproducer countries: Belize (5 wells); Guatemala (1); Honduras (3); Jamaica (1); and Paraguay (6). All of these tests were abandoned, essentially dry. The negative results of the Honduras drilling, all offshore, underline the more general industry discouragement over the past 5 years in the western Caribbean. Major amounts of acreage were released in eastern offshore Nicaragua during 1972, and some in neighboring Honduras waters; and further relinquishments are indicated for 1973.

Bolivia reports a first modern wildcat, drilling at year end, in the huge Altiplano basin, on the remarkable high-Andes plateau of the same name. This test spudded at the believed record surface elevation of 3,851 m (12,635 ft).

The vast trans-Andean basin (or basins), extending from Colombia southward through eastern Ecuador and Peru and into northeastern Bolivia, holds stage center in South America onland exploration, and probably will con-

December 31, assigning their interests to Union and Anglo. The 227,000 ha. shown are held jointly by Anglo and Union, each with a 50% interest.

**FRENCH GUIANA**

Information furnished by L. H. NARDON, ELF/ERAP, Paris, France

The ELF Suriname/Shell/EURAFREP Group, ELF the operator, obtained a 3-year renewal of their major offshore permit effective from October 1972. The concession area is shown in the review of 1967 (Hadley and Neff, 1968, Fig. 25).

Marine seismograph work totaling 430 km was carried out in the western part of the permit area.

**Reference Cited**

Hadley, W. H., and C. H. Neff, 1968, Review of 1967 petroleum developments in South America, Central America, and Caribbean area: *Am. Assoc. Petroleum Geologists Bull.*, v. 52, no. 8, p. 1366-1438.

**GUATEMALA (Fig. 15; Tables 44, 45)**

By R. A. DORSEY, JR., Esso Exploration Inc., Coral Gables, Florida

Guatemala continued to have a modest amount of petroleum activity during 1972. On the Pacific shelf, Texaco-Mobil shot 301 mi of marine reflection seismograph in the 352,285 ha. they hold there. Esso drilled Petrel-1, a new-field wildcat, to a depth of 11,781 ft on a seismic prospect near the Pacific shelf edge. The well was abandoned dry on May 15, 1972, in Cretaceous sediments. Esso held Rights to 277,772 ha. on the Pacific shelf at year end.

It is understood that both Esso and Texaco-Mobil are planning to release their acreages in 1973.

Compania Centram S.A. held Rights to 329,224 ha. in east-central Guatemala and in Guatemala waters in the Gulf of Honduras. Westcoast Petroleum Ltd. of Calgary, Canada, as operator for this acreage, conducted a 318-km marine reflection seismic survey in the Bay of Amatique.

The only other acreage under concession is the 374,449 ha. nominally held by Rudy Weissenberg Martinez in the general Peten region. Recursos del Norte Limitada (Basic Resources International Ltd.) has taken over exploration activities initiated by the Monsanto Co. affiliate Monoil de Guatemala Inc. in the Weissenberg Martinez Rights. This work continued to center on the "Las Tortugas" locality of long known and suspected salt domes where earlier core-hole drilling, first directed to sulfur exploration,

had found hydrocarbon indications at shallow depths. According to press reports, 1972 effort consisted of 2 further coreholes plus a third drilling at year end. In some quarters, the "Las Tortugas" results have been seen as a first commercial discovery for the country, but Guatemala's Mining and Hydrocarbons Office has issued tempering public statements to the effect that the economic significance has not been fully determined.

During 1972 the Government moved further in the direction of the service-contract approach for all future exploration and development arrangements. The most immediate impact has been in the Peten, where, according to press reports, 15 companies had by year end filed applications (many overlapping) covering virtually that entire sector. Press releases in early 1973 disclose that the general Peten region has been officially parceled into 17 arbitrarily delimited blocks of about 300,000 ha. each (excluding, of course, the existing Weissenberg Martinez areas). Presumably, the many pending applications stand rejected, and new ones will be invited on the blocks as now defined. Meanwhile, work continues toward a model contract, which reportedly will be adapted from that of Peru and will provide for a first-time state oil entity for Guatemala.

**GUYANA (Fig. 16)**

By SOBHARAM SINGH, Commissioner of Geological Surveys and Mines, Georgetown

No geophysical work or exploration drilling was undertaken during the year. There was, however, a significant revival of interest in concessions on the continental shelf. After protracted negotiations, Deminex was granted an Oil Prospecting License over 5,900 sq mi of the shelf, coinciding roughly with the concession given up by the Continental-Tenneco consortium. OXOCO Guyana Ltd. extended its concession by 1,230 sq mi. Comoro Exploration Guyana Ltd. relinquished its westernmost concession but renegotiated an Oil Prospecting License covering 1,660 sq mi, assigning an 80% interest to Tricentrol.

The new concessions as well as renewals incorporate intensive working obligations on a year-to-year basis and the beginning of 1973 saw several seismic crews on the Guyana shelf.

**HAITI (Fig. 13)**

By PETROCONSULTANTS S.A., Geneva, Switzerland

In early 1972, Wendell Phillips Oil Co. was granted prospecting and exploitation rights over a total of 86,350 sq km covering the ma-

ers of an exclusive oil and gas exploration permit on the north coast of Puerto Rico, have held meetings with the Natural Resources staff members, and a draft of new regulations is being formulated.

Other permit holders are Oceanic Exploration, Sun Oil Co., and Puerto Rican Exploration Co. The acreage picture, unchanged from last year, appears in the review of 1971 (Jacobsen and Neff, 1972, Fig. 26).

#### Reference Cited

Jacobsen, P., Jr., and C. H. Neff, 1972, Review of 1971 petroleum developments in South America, Central America, and Caribbean area: *Am. Assoc. Petroleum Geologists Bull.*, v. 56, no. 9, p. 1602-1660.

#### SURINAM

Information furnished by L. H. NARDON, ELF/ERAP, Paris, France

ELF, operator for the ELF Suriname/Shell/EURAFREP Group, did a 2,460-km marine seismograph program in the eastern and southern parts of their major offshore concession.

The concession area is unchanged from that shown in the review of 1970 (Neff, 1971, Fig. 16).

#### Reference Cited

Neff, C. H., 1971, Review of 1970 petroleum developments in South America, Central America, and Caribbean area: *Am. Assoc. Petroleum Geologists Bull.*, v. 55, no. 9, p. 1418-1482.

#### TRINIDAD AND TOBAGO

(Figs. 25, 26; Tables 57-63)

By GEORGE H. LEGALL, Ministry of Petroleum and Mines, Port-of-Spain

Trinidad and Tobago's petroleum industry received a welcome and long-awaited boost during 1972, when Amoco Trinidad Oil Co. began commercial oil production. The decline in crude oil production which had begun in February 1968 was arrested, and at the end of the year, production had crossed the 150,000 b/d level.

On the drilling scene there was a decrease in footage compared with 1971, due mainly to the decrease in activity on the north coast.

Table 58 summarizes and compares petroleum industry statistics for Trinidad and Tobago over the past 3 years. Highlights of the petroleum industry during 1972 include the following.

1. Amoco Trinidad Oil Co. commenced commercial oil production operations off the east coast of Trinidad in January 1972. In

March, the company shipped the first barrel of crude from its Teak "A" platform, via its on-shore Point Galeota facilities and the single-buoy mooring off the southeastern end of the Island. Amoco also discovered its third oil field, Poui, in the West Tourmaline area, which is expected to be producing in early 1974.

2. In March 1972, the government of Trinidad and Tobago began detailed discussions with Amoco Trinidad Oil Co. and People's Gas Co. of Chicago on the establishment of a liquefied natural gas plant in which about 450 MMCFD of natural gas will be liquefied for export to the United States over a 20-year period. At a total cost of about \$1.2 billion (T and T), this LNG project will be the largest single investment ever undertaken in Trinidad and Tobago. The government of Trinidad and Tobago will hold 51% equity in the liquefaction plant and 50% in the pipelines transmission system, and will retain an option up to 25% in the tankers. The proposed site of the LNG plant is at Point Lisas on the sheltered west coast of Trinidad.

3. The construction of Texaco's \$160 million (T and T) desulfurization plant at Pointe-a-Pierre, which commenced in February 1971, was essentially completed by the end of 1972. This plant, designed to produce low-sulfur fuel oil, is vital in maintaining the level of fuel-oil exports to United States markets as a result of stringent antipollution regulations in force in that country.

4. Delta Exploration Co. of Houston, Texas, conducted a 1,300-mi marine geophysical survey in the northern half of the Gulf of Paria and on open acreage off the east coast of Trinidad, in a joint venture with the Ministry of Petroleum and Mines. The 1.8-million acre coverage area included part of the continental slope, in water depths ranging from 600 to 2,000 ft.

5. In 1972, Trinidad and Tobago National Petroleum Marketing Co., a subsidiary of the National Petroleum Co., was created to acquire, first, the entire domestic marketing outlets of BP Trinidad, and afterward, 33 of the 56 Esso retail outlets in Trinidad and Tobago. This venture allows the government to increase its active participation in the oil industry.

#### Geologic and Geophysical Activity

Delta Exploration Co. Inc., in a joint venture with the Ministry of Petroleum and Mines, conducted a 1,300 line-mi marine geophysical survey off the coasts of Trinidad and Tobago during April and May 1972 (Table 59).

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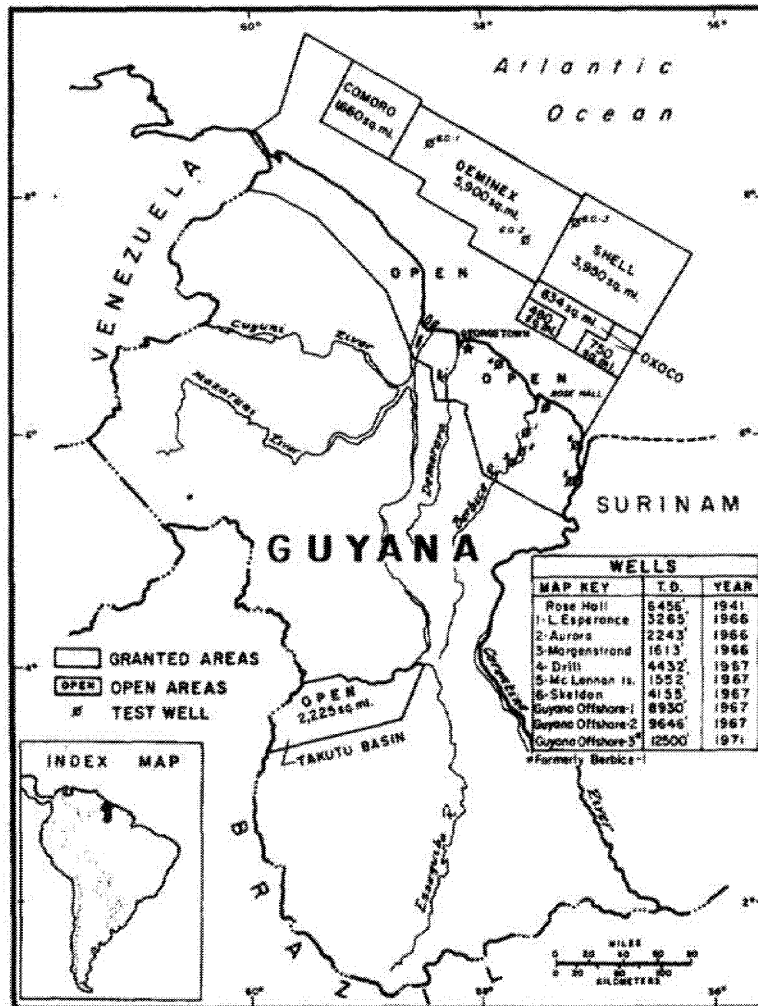


FIG. 16—Guyana, license areas year end 1972, and drilling of prior years.

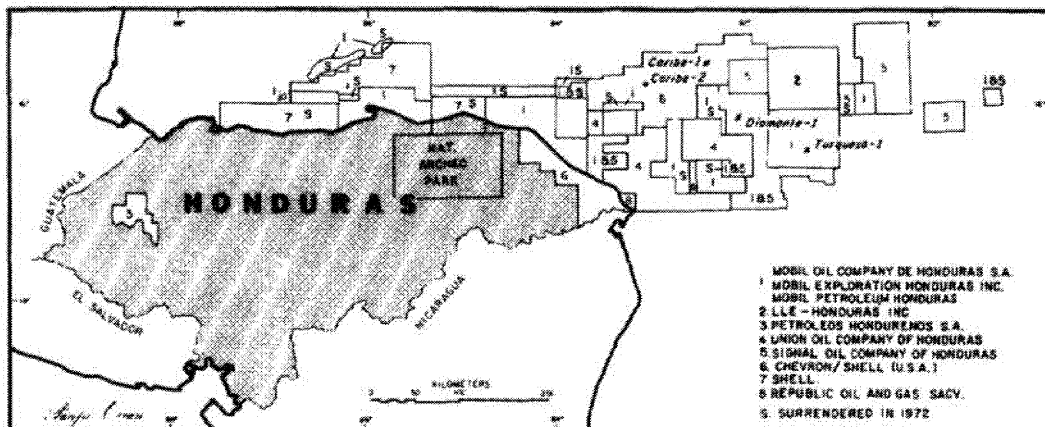


FIG. 17—Honduras, 1972 concession areas and wildcat wells.