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Petroleum Developments in South America, Central America, and Caribbean Area in 1974[1]

L. E. HATFIELD,[2] B. A. TATOR,[2] and C. H. NEFF[2]
Miami, Florida 33143

Abstract The 1974 review presents information on petroleum developments in 30 countries and areas. Petroleum was produced in 11 countries with total production of 1,551,745,000 bbl (4,251,353 b/d) an 8.9% decrease from the 1973 production level. Venezuela accounted for the major part of the volume decline by reducing production 389,773 b/d from 1973 levels to 2,976,249 b/d. However, Venezuela still accounted for 70% of the total production of the area. Ecuador's production decreased by 15.2% to 177,029 b/d because of governmental restriction coupled with pipeline breaks. Production decreased less precipitously in Argentina, Colombia, Bolivia, and Chile. Trinidad and Tobago reported the largest volume increase (12.3%) followed by Brazil (4.2%) and Peru (9.2%); in each, offshore activities were responsible for these production increases and perhaps the most noteworthy development of the year was the increase in offshore activity.

Total wells drilled were 1,730, an increase of 92 or 5.6% over the 1973 level with Brazil and Peru reporting increases of 46 and 63 wells respectively. The number of exploratory wells completed (405) represents an increase of 21 or 5.5% over 1973 completions with Peru reporting 43, an increase of 38.7% above the 1973 level. Brazil reported 17 rigs operating in the offshore. Successful exploratory completions (128) increased by 4%. Peru and Venezuela recorded the highest success ratios (51 and 66% respectively) of the 13 countries in which exploratory wells were drilled. Exploration drilling results offshore Caribbean and Pacific Nicaragua (3 wells), Gulf of Panama (2 wells), and Guyana (2 wells) continued to be disappointing. A new-field discovery in Guatemala (Rubelsanto 1) has the potential to be Central America's first commercial production.

Geologic and geophysical party-months of field work (1,150.2) registered a 12.5% increase over 1973 which reflected a 125.4-party-month (+16.1%) seismic and a 28.5-party-month (+74.2%) gravity increase; however, surface geology decreased by 20.7 party-months (−10.8%). Peru reported the highest total (271 party-months) of seismic activity, an increase of 14%, but Bolivia with 92.9 party-months registered a 228% increase. Argentina and Brazil maintained their 1973 level of seismic activity with 268 and 117 party-months respectively.

Four new contract operations were signed with YPFB making a total of 11 operational companies or groups exploring in Bolivia at year-end.

Introduction

Petroleum production in 1974 from 11 countries in the review area was 1,551,745,000 bbl, a decrease of 8.9% from the previous year (Tables 1, 2). Even though production in Venezuela decreased 11.6% from 1973, that country continued as the dominant producer—70% of the total—as oil was produced at a rate of 2,476,249 b/d. Production increased in Trinidad (12.2%), Peru (9.2%), and Brazil (4.2%), and in each country the increase was a result of the successful developments offshore. Production from the offshore area of Trinidad was one of the highlights of 1974.

The total wells drilled were 1,730, up about 5% from 1973 in both exploration and development categories (Table 3). Argentina (606 wells), Venezuela (416), Trinidad (200), Brazil (176), and Peru (152) were the leaders in drilling.

In exploration drilling the continued intensive work on the continental shelf of Brazil by Petrobras was a notable accomplishment. Unfortunately offshore exploratory drilling in Guyana, Nicaragua, and Panama had negative results. In the Oriente of Peru exploration drilling is following the vigorous seismic work of the past 3 years and a similar pattern probably will be followed in Bolivia.

Oil exploration or related activity is reported for 30 countries or areas in Latin America and the Caribbean; 18 had field-party effort. Total party-months of geologic/geophysical exploration was 1,150 m, up 12% from 1973 (details in Table 4). Argentina with 364.5 party-months continued as the leader, followed by Peru, Bolivia, and Brazil with total party-months of 305, 161, and 117 respectively. Peru was the leader in seismic work—271 party-months—and total seismic effort accounted for 903.8 party-months or 72.5% of the total party-months of exploration.

Guatemala gave indications of becoming the first country in Central America to establish commercial production as the Shenandoah group's Rubelsanto 1 produced oil at rates up to 2,250 b/d from the Cretaceous. This, coupled with the much publicized results from recent drilling in adjacent areas of Mexico, has resulted in a revival of interest in the Peten region of Guatemala.

In Colombia the concession system was abolished and henceforth all exploration and development will be carried out by association contracts with the state company Ecopetrol. In much of the area covered by this review, the present tendency is toward that type of arrangement.

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[2]Weeks-Tator Consulting Geologists, Inc.

This year marked the 60th anniversary of Shell's well Zumbaque 1, which was completed for 250 b/d in 1914 (and still makes 90 b/d) discovering the giant Mene Grande oil field and opening the Maracaibo basin.

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ARGENTINA

Marcelo R. Yrigoyen, Esso S.A.P.A., Buenos Aires

BAHAMAS

Ministry of Development, Nassau

BARBADOS

Edward E. Hickam, General Crude Oil Co., Houston, Texas

BELIZE

Enzo Zappaterra, Chevron Overseas Petroleum, Inc., San Francisco, California

BOLIVIA

Jaime Oblitas Garcia, Yacimientos Petroliferos Fiscales Bolivianos (YPFB), Santa Cruz

BRAZIL

Francisco Paula de Medeiros, Petrobras, Rio de Janeiro

CHILE

Mario Marino P., Empresa Nacional del Petroleo (ENAP), Santiago

COLOMBIA

Norman R. Rowlinson, Petrolinson S.A., Bogota

COSTA RICA

L. J. Pradal, Elf Aquitaine Group, Paris, France

CUBA

Michel Godel, Petroconsultants S.A., Geneva, Switzerland

DOMINICAN REPUBLIC

Michel Godel, Petroconsultants S.A., Geneva, Switzerland

ECUADOR

R. W. Canfield, Texaco Petroleum Co., Quito

GUATEMALA

W. Kenneth Hall, Shenandoah Oil Corp., Fort Worth, Texas

FRENCH GUIANA

GUYANA

HAITI

Michel Godel, Petroconsultants S.A., Geneva, Switzerland

HONDURAS

C. J. Miller, Shell Oil Co., Houston, Texas

JAMAICA

Raymond M. Wright, Mines and Geology Division, Kingston

LESSER ANTILLES

Michel Godel, Petroconsultants S.A., Geneva, Switzerland, and Edward E. Hickam, General Crude Oil Co., Houston, Texas

NETHERLANDS ANTILLES

Michel Godel, Petroconsultants S.A., Geneva, Switzerland

NICARAGUA

L. H. Goldsmith, Central American Mining and Development Co., S.A., Managua

PANAMA

Michel Godel, Petroconsultants S.A., Geneva, Switzerland

PARAGUAY

P. Jacobsen, Jr., Esso Inter-America, Inc., Coral Gables, Florida

PERU

Fernando Zuñiga y Rivero, Petroleos del Peru, Lima

PUERTO RICO

Guy Mondolini, Puerto Rico Water Resources Authority, San Juan

EL SALVADOR

Michel Godel, Petroconsultants S.A., Geneva, Switzerland

SURINAM

L. J. Pradal, ELF Aquitaine Group, Paris, France

TRINIDAD AND TOBAGO

George H. Legall, Ministry of Petroleum and Mines, Port of Spain

URUGUAY

Andres Tierno Abreu, Administracion Nacional de Combustibles, Alcohol y Portland, Montevideo

VENEZUELA

Neal R. VanMiddlesworth, Venezuelan Oil Scouting Agency (VOSA), Caracas

had been recovered in drillstem tests of 4 separate zones within the Cretaceous Coban Formation. The highest flow rate was 2,250 b/d on a ⅜-in. choke, and the combined potential of all zones was about 3,000 b/d. The tests were conducted over a gross formation depth interval between 4,112 and 5,253 ft. Additional drilling below the interval indicated the presence of other prospective zones, not yet fully evaluated.

The reservoirs are largely dolomite beds within a predominantly anhydrite sequence near the lower part of the Coban Formation. Owing to mechanical difficulties, the well was completed at a depth of 5,328 ft, leaving an undetermined thickness of the prospective lower Coban strata unevaluated. Although the dolomite reservoirs tend to be thin, favorable reservoir characteristics and the apparent multiplicity of pays, ultimately may prove Rubelsanto 1 to be the first viable discovery in Central America outside of Mexico.

In the course of the year, offset wells Rubelsanto 2 and 3 (Table 46) were spudded 3 km west and east, respectively, of the discovery. At year-end, both wells were involved in fishing jobs, Rubelsanto 2 at a depth of 5,558 ft and Rubelsanto 3 at 2,400 ft.

The Shenandoah Group also tested and abandoned 2 shallow wells (63-6 and 63-7) in May which had been drilled previously on the flanks of the Tortugas salt dome.

The Zamora/Centram combine continued preparation for the drilling of Manglar 1 in the Gulf of Honduras (Fig. 11). The proposed well, the first of a 2-well program, is scheduled to spud in early 1975 at a location 12 mi off Guatemala in 153 ft of water.

The group controls an approximate 790,000-acre tract in the coastal area of east-central Guatemala. Zamora, a wholly owned subsidiary of Westcoast Petroleum of Calgary, is operator for the combine, the other joint title holder being Cia. Centram, a subsidiary of International Nickel Co. of Canada Ltd.

Exploration activity by the group during 1974 was confined to a 90-mi offshore-seismic survey.

The much publicized press coverage in September concerning speculation as to the potentially large reserves attributable to Pemex's Reforma area Cretaceous discoveries in southern Mexico, combined with the added encouragement from the Rubelsanto discovery in Guatemala, succeeded in focusing industry attention on the carbonate prospects of this part of the southern Gulf coast sedimentary province. As all Mexican oil activities are state controlled, Guatemala's bordering Peten region became the logical target of exploration, being open to foreign participation, and within a similar structural depositional framework.

By November 1974, in anticipation of the long pending passage of service contract legislation, 42 different applications had been filed in the Peten region. The applications were made without respect to fixed or defined geographic areas, and as a consequence most were overlapping. The government provisionally restructured the contract areas in November to include 14 blocks, each averaging slightly less than 400,000 ha. (about 1 million acres). By March 1975, 12 different companies, including equal numbers of independents and majors, had applied variously for 9 of the blocks under the new format.

For more than 3 years the government has been working toward the establishment of a model service contract to provide a mechanism to allow foreign interests to explore in the country under terms which are more modern than provided by the old Petroleum Code. These matters were advanced further in 1974 by the Congressional passage of Decree-Law 62-75 in June which governs production sharing, and the approval in October of the same year of the Regulations (Government Resolution 21-74) to the new Petroleum Decree-Law. The final instrument to implement the new legislation, the model contract itself, had not been published by year-end, although most authorities believed that it would be ready by early to mid-year 1975.

Decree-Law 62-74, effectively the new Petroleum Law, guarantees a minimum 50% share of production to the state on a no-risk basis. In addition, it establishes that in lieu of income tax, a payment equivalent to 40% of the market value of the contractor's crude will be made.

In addition, terms are reported to include a maximum 3-year exploration period with a possible 3-year extension, and a minimum investment during the former period of $5 million, 2 million to be spent on the drilling of at least 2 wildcats, and 3 million on seismic. As was indicated above, the newly defined contract area would amount to no more than 400,000 ha. (about 1 million acres).

French Guiana

The Elf-Aquitaine/Shell/Eurafrep group holds the only exploration rights and these are in the offshore area. There was no field-exploration activity in 1974, however, exploratory drilling is planned for 1975.

Guyana (Fig. 12)

After a lapse of almost 3 years, exploratory drilling was resumed in Guyana. The first drilling in 1974 was by Guyana Shell, who in September

abandoned Mahaika 1 (Fig. 12) at a depth of 7,000 ft; water depth was 180 ft and the location was approximately 105 km offshore northeast of Georgetown at geographic coordinates 7°27′36″N lat. and 57°09′16″W long. Shell then drilled Berbice 2 (7°48′56″N and 57°15′35″W) to TD 11,049 ft in 400 ft of water at a location about 6 km south of Berbice 1 (TD 12,500 ft) which was drilled in 1971. Berbice 2 was abandoned in November. Near the end of December a third wildcat, Abary 1, was spudded by Shell at geographic coordinates 7°19′14″N lat. and 56°42′46″W long.

In November Deminex started drilling Essequibo 1 in its offshore block approximately 140 km north-northeast of Georgetown; it was drilling at a depth near 5,000 ft at year-end. In conformity with the petroleum legislation, Deminex converted its Oil Exploration License to Oil Prospecting Licenses before starting to drill.

Haiti (Fig. 9)

By MICHEL GODEL, Petroconsultants S.A., Geneva, Switzerland

In early 1974 Weeks Natural Resources acquired an option on Wendell Phillips exploration permit covering 86,350 sq km of on- and offshore Haiti. By conducting seismic work Weeks Natural Resouces could earn a 40% interest with the remaining 60% earned by Bonanza International Petroleum and Haven Oil. Wendell Phillips would have retained an overriding royalty.

Weeks did reconnaissance marine-seismic work off Haiti in February and in December 1974, shooting a total of 300 line-mi. Weeks did not exercise its option after an additional seismic program shot in February 1975.

Honduras (Fig. 13)

By C. J. MILLER, International Ventures, Shell Oil Co., Houston, Texas

There was no drilling activity in Honduras during 1974.

Marine-seismic operations (770 line km) were conducted by Shell Exploration Honduras Ltd. (SIPM) in the Caribbean Sea north of the mainland.

Louisiana Land and Exploration relinquished its concessions during the year. Concession status at the end of 1974 shows Weeks (awarded 1973), Union, Signal, Occidental, and Shell (SIPM) as remaining holders of concessions in offshore Honduras.

A geologic map of Honduras was issued by the government in 1974 (scale 1:500,000).

Jamaica (Fig. 14)

By RAYMOND M. WRIGHT, Mines and Geology Division, Kingston 6

Exploration activity reached a low level in 1974. The only concession was held by Weaver International Jamaica Corp. and associates and there was no drilling activity. Its onshore holdings totaled 4,241.86 sq mi. Southern Jamaica, the Pedro Banks, and other offshore banks and cays on the southeast were open to concession.

Detailed surface mapping was conducted by the Weaver group on the Flower Hill and Blowfire Hill structures along the north coast as part of its ongoing exploration program.

Although no new geophysical surveys were initiated, the Jamaican government has been involved with the reevaluation of geophysical data in the Pedro Bank area. Possible structural traps in the Pedro Bank area were identified in a study completed in September, using the Signal-Occidental seismic data from the period 1967-1969. In the last quarter of the year the government took steps to acquire copies of the magnetic tapes of seismic data from Burmah and Occidental to enhance some of the output in critical lines by reprocessing.

During 1974 the government developed policy for encouraging exploration, and greater activity is expected by the second half of 1975.

Lesser Antilles (Figs. 15-16; Table 47)

By MICHEL GODEL, Petroconsultants S.A., Geneva, Switzerland

No exploration activity was reported during 1974 in the Lesser Antilles, but several changes have been reported in the concession situation. In the Leeward Islands, Atlantic and Oceanic released all of its offshore tracts which covered a total area of 24,270 sq km. In the same area Weeks Natural Resources was granted a seismic permit on the Saba Bank under Netherlands Antilles jurisdiction (see Netherlands Antilles for full details).

In the Windward Islands, General Crude Oil and Minerals S.A. is the sole concessionaire. During the year 1974, General Crude relinquished 875 sq km (216,116 acres) of the original 2,245-sq-km (554,880 acres) concession area, which included all of the Island of St. Vincent and the offshore waters of the Grenadines on the south. The area retained, 1,370 sq km, is entirely offshore. A seismic program in addition to the one previously carried out in 1973 is scheduled for the offshore

blocks in the Oriente zone. A total of 9 new-field wildcats was drilled with 4 discoveries of noncommercial heavy oil and 5 dry holes. Ten rigs were active at year-end.

In the Coastal zone, 17 exploratory wells were drilled, 15 of which were in the productive area of the Talara fields. Of these 15 wells, 8 were discoveries. The other 2 exploratory wells, both dry holes, were drilled by Tenneco offshore from Tumbes near the Ecuadorian border.

A total of 109 development wells was drilled in the Talara area of the Coastal zone, 71 by PetroPeru and 38 by Belco, with 91 producers. At year-end, 11 rigs were active in the Coastal zone.

Production

Total crude oil production for 1974 was 28,141,804 bbl (77,101 b/d), an increase of 9% over 1973. Nearly all of the increase came from the Coastal zone which produced 27,242,806 bbl (74,638 b/d). It is noteworthy that production began from PetroPeru's Corrientes field in Block 8, the first from the areas under the contract-block system. The purpose of this production, which amounted to 339,635 bbl from a single well, was to make up the deficit of crude for the Pucallpa refinery owing to production decline in the nearby Agua Caliente field.

General

Bechtel Corp. has been contracted to supervise the construction of the North Peru pipeline from PetroPeru's Block 8 in the Eastern zone to the Pacific coast (Fig. 20). Construction contracts have been let to TECHINT, an Italo-Argentine company for 400 km of 36-in. line over the Andes to the coast, and to a consortium, Williams-Sedco-Horn for 453 km of 36- and 24-in. line in the Eastern zone. At year-end pipe was being stockpiled but construction had not begun. Target for completing the line is September 1976.

Puerto Rico

Information concerning Puerto Rico Water Resources Authority furnished by GUY MONDOLINI, San Juan

During 1974 several changes were made in the acreage covered by oil and gas exploration permits. Sun Oil Co. relinquished its rights in the eastern part of the island and adjacent offshore. The Weaver group dropped its rights along the northern coast and adjacent offshore area. Puerto Rico Exploration Co. reduced its holdings along the south coast in the Santa Isabel area but still retains 4 blocks. Oceanic Exploration Co. retains its permit covering an offshore area of approximately 2,435 sq mi between the west-central coast and Mona Island. A marine-seismic survey of 250 line mi was carried out in the permit area.

Oil and gas prospect permits on the northern and eastern coasts and adjacent offshore were obtained by the Puerto Rico Water Resources Authority (a public power utility company). These were obtained following an offshore seismic survey by Western Geophysical for the Water Resources Authority in connection with the siting of a nuclear power plant. Geophysical data indicated the possibility of a sizable oil and gas reservoir in the offshore area.

Legislation is being considered for the creation of a mining corporation for exploitation of mineral resources. The mining corporation will have enough flexibility to enter into agreement with private or public corporations.

El Salvador

By JOSE CARVAJAL, Petroconsultants S.A., Geneva, Switzerland

No rights are held currently in El Salvador.

Under terms of Decree No. 170 of September 1974, companies were invited to seek qualifications to bid for offshore acreage. The companies had 50 days to apply for qualification by contacting CONAPE, the Salvadorean state company. Offers were made by 5 companies: Amoco, Mobil, Continental, Shell Oil, and Reading & Bates. The government rejected 4 offers stating that the companies had not agreed to the minimum bases required. The fifth (unidentified) company withdrew when the government was preparing to negotiate.

The government is preparing a second call for bids for offshore acreage.

Surinam

By L. J. PRADAL, Elf-Aquitaine Group, Paris, France

During 1974 a detailed marine-seismic survey was carried out by Elf/Shell/Euratrep in an area where previous work had shown potential prospects. On the basis of this work, an offshore wildcat will be drilled in 1975. Water depth at the location is 120 m.

Trinidad and Tobago (Tables 57-64)

By Ministry of Petroleum and Mines, Port of Spain

Crude Oil Production

During 1974 Trinidad and Tobago consolidated its position as an oil producer not only by enhancing the steps initiated 2 years ago, but also by paving the way to place the country in a better position in relation to other oil producers.

Crude oil production for the year averaged 186,673 b/d, the highest ever recorded, and the year's

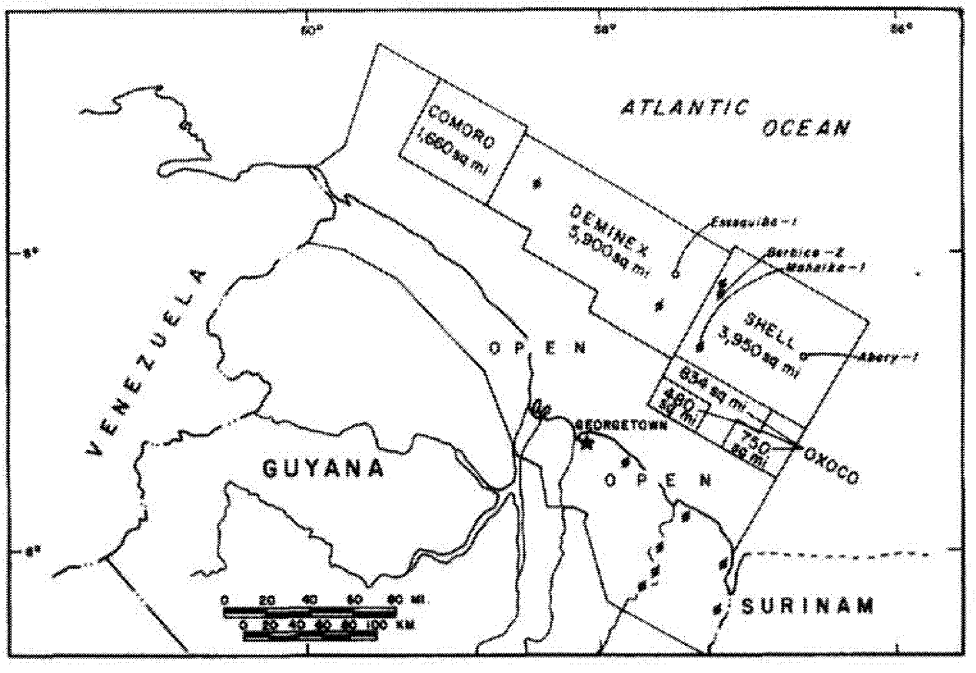

FIG. 12—Guyana, 1974 oil exploration licenses and drilling from current and previous years.

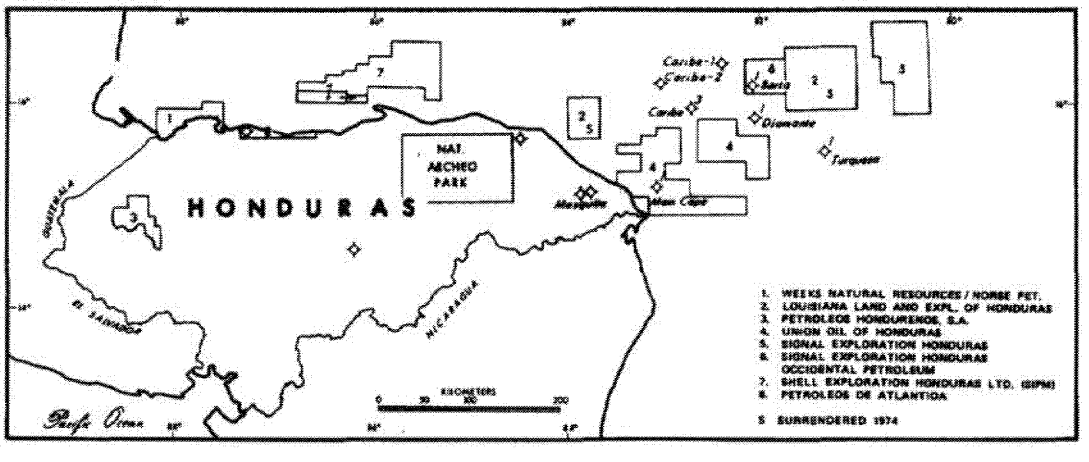

FIG. 13—Honduras, concessions at year-end 1974 and exploratory wells from prior years.