

## THE MINERAL INDUSTRY OF

# SENEGAL

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Phosphate rock production and gold and petroleum exploration dominated Senegal's mineral sector activity in 1999. Most of the phosphate rock produced by the country was processed domestically and converted to fertilizers and phosphoric acid. Gold was produced in minor amounts, although many foreign companies had active exploration permits in the southeastern part of the country where Precambrian (Birimian) metamorphic rocks are exposed. Senegal's gross domestic product (GDP) for 1999 was estimated to be \$4.8 billion, and the estimated annual GDP growth rate was 5.2% (World Bank Group, September 12, 2000, Senegal at a glance, accessed February 2, 2001, at URL [http://www.worldbank.org/data/countrydata/aag/sen\\_aag.pdf](http://www.worldbank.org/data/countrydata/aag/sen_aag.pdf)).

Ashanti Goldfields Co. Ltd. of Ghana, Etruscan Resources Ltd. of Canada, Hargraves Resources NL of Australia, and IAMGOLD Corp. of Canada were among the companies that had active exploration permits in Senegal in 1999. Ashanti Goldfields and its partner IAMGOLD were working on the Mako concession. IAMGOLD continued exploration work on the Daorala-Boto concession, which the company has solely owned since 1998 when Ashanti relinquished its participation in the project. Ashanti was funding 100% of the exploration activities in the Bambadji property, but in October 1999, the company decided to return the property to IAMGOLD after poor results were obtained from drilling.

In 1999, Hargraves Resources was taken over by Durban Roodeport Deep Ltd. of South Africa. The company was granted a gold exploration license that was valid for 4 years in the Tambakounda region of eastern Senegal. Final approval to work on the Sonkounkou permit in southeastern Senegal was granted to Avgold Ltd. of South Africa. The company conducted airborne magnetic and radiometric surveys of the property in 1999.

Etruscan Resources, which had acquired a 90% equity interest in Secor Geomin Mining and Development Corp. in 1998, held the Bousankouba permit in eastern Senegal. Exploration activities had identified a regional gold-arsenic anomaly in the area. The property, however, remained inactive during 1999 as the company focused on the development of the Samira Hill gold project in Niger (Etruscan Resources Ltd., 2000, p. 10). In association with Tarcoola Ltd. of Australia, Takoradi Gold Ltd. of Ghana was granted a gold exploration license for the Madina-Foulbe property, and Cluff Mining PLC of the United Kingdom was awarded a gold and base metals permit for the Niokolo property in May 1999 (Mining Journal, 2000).

Iron ore reserves have been estimated to be 391 million metric tons (Mt) in the Faleme deposit and 250 Mt in the Farangalia and the Goto deposits (Mining Journal, 2000). Despite the existence of the resources, no exploitation project was underway in 1999.

Plans for the construction of a second cement plant were underway in 1999. The plant will be located about 30 miles east of Dakar and will be owned by Ciments du Sahel S.A., which was a Senegalese company.

Phosphate was produced at the Taiba Mine, which was operated by Compagnie Senegalaise des Phosphates de Taiba. Other phosphate deposits exist in the country. The Matam deposit which contained reserves of 40.5 Mt, was among the country's future targets for exploitation. Industries Chimiquet du Senegal planned to invest \$1 million in the construction of a new phosphate mine in the Matam area (Mining Journal, 2000).

Senegal's oil industry was regulated by the Ministry of Energy, Mines and Industries. The Société des Petroles du Senegal (Petrosen), the national oil company, was responsible for all hydrocarbon exploration activities. Hydrocarbon exploration and production in Senegal were regulated by law No. 98-05 of January 5, 1998 [Mbendi Information Services (Pty.) Ltd., September 29, 2000, Senegal oil and gas industry, accessed November 28, 2000, at URL <http://mbendi.co.za/indy/oilg/af/sn/p0005.htm>].

The country's natural gas reserves, which were estimated to be 3 billion cubic meters, were located primarily onshore [Mbendi Information Service (Pty.) Ltd., September 29, 2000, Senegal oil and gas industry, accessed November 28, 2000, at URL <http://mbendi.co.za/indy/oilg/af/sn/p0005.htm>]. In 1999, natural gas was produced by Tullow Oil plc of Ireland in association with Petrosen and SAIM, from the Diam Niadio East Field. The joint venture of Tullow Oil (90%) and Petrosen (10%) was exploring the regional Sebikhotane permit (Tullow Oil plc, May 29, 2000, Senegal report, accessed March 21, 2001, at URL <http://www.tullowoil.ie/ver4/explore/sngl/1.html>; U.S. Energy Information Administration, September 2000, Senegal—Country analysis briefs, accessed March 7, 2001, at URL <http://www.eia.doe.gov/cabs/senegal.html>).

Oil exploration activities conducted by Benton Oil and Gas Co. of the United States in the Dome Flore field continued until October 1999. The field, which was located offshore southern Senegal near the border with Guinea-Bissau, had been the subject of a boundary dispute between the two countries since the 1950's. In 1995, the dispute was settled, and joint exploitation was permitted by the ratification of a treaty in which 85% of the proceeds from the activities in the area went to Senegal and 15% went to Guinea-Bissau and the Agence de Gestion et de Cooperation, which was an agency created for the joint development of maritime resources in the area, was established. The field's heavy crude reserves have been estimated to be 700 million barrels (U.S. Energy Information Administration, September 2000, Senegal—Country analysis briefs, accessed March 7, 2001, at URL <http://www.eia.doe.gov/cabs/senegal.html>).

Other companies involved in offshore exploration were Roc Oil Co. Ltd. of Australia and Vanco International Ltd. of the United States. In October 1999, Roc Oil signed a production-sharing contract (PSC) with Petrosen for exclusive rights to explore Casamance offshore blocks 1, 2, and 3, the blocks are located offshore southern Senegal and cover a total area of 8,187 square kilometers. Roc Oil held a 92.5% interest in the project, and Petrosen held 7.5% (U.S. Energy Information Administration, September 2000, Senegal—Country analysis briefs, accessed March 7, 2001, at URL <http://www.eia.doe.gov/cabs/senegal.html>). Roc Oil, in joint venture with Woodside Energy Ltd. of Australia, was studying several blocks onshore and offshore Senegal in 1999. The companies signed a memorandum of understanding with Petrosen that proposed a work program to justify the granting of a hydrocarbon prospecting authorization and that would give them the right of first refusal to negotiate production-sharing agreements (Wilkinson, 1999). Also in October 1999, Vanco signed a PSC with the Government of Senegal for the Dakar Offshore Profond Permit, which was a deepwater block that extended from Senegal's offshore boundary with Gambia to its border with Mauritania. Vanco was the operator of the concession holding a 90% interest; the remaining 10% was held by Petrosen (Oil & Gas Journal, 1999).

Senegal's petroleum refining company Société Africaine de Raffinage, which was located in Dakar, processed about 770,000 metric tons of imported crude oil each year. The refinery's capacity was about 1 million metric tons per year of oil [Mbendi Information Services (Pty.) Ltd., September 29, 2000, Senegal oil and gas industry, accessed November 28, 2000, at URL <http://mbendi.co.za/indy/oilg/af/sn/p0005.htm>].

Société Nationale d'Electricité (SENELEC) was responsible for generating, transmitting, and distributing the majority of

Senegal's electricity. In March 1999, the Government divested some of its interest in SENELEC. A consortium comprised of Hydro Quebec of Canada and Lyonnaise de Eaux of France acquired a 34% interest in SENELEC. The Government retained ownership of 41% equity interest in the company, 15% was traded on the Bourse Regionale des Valeurs Mobilières, and the remaining 10% interest was set aside for purchase by employees. An oil-fired powerplant constructed by the consortium of Hydro Quebec International, Groupe Chagnon International Ltd. of Canada, and Holding Keur Khadim of Senegal began operating in January 1999. The plant had a generating capacity of 37.4 megawatts (MW). Work to extend the operating life of the Bel Air power station was completed in November 1999 (U.S. Energy Information Administration, September 2000, Senegal—Country analysis briefs, accessed March 7, 2001, at URL <http://www.eia.doe.gov/cabs/senegal.html>). Also in November, SENELEC signed a new 15-year agreement with the GTi Dakar Power Plant to buy the power. GTi Dakar had built a 56-MW combined-cycle powerplant at Cap des Biches under a build, own, operate, and transfer option before SENELEC's privatization (Africa Energy & Mining, 1999).

### References Cited

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TABLE 1  
 SENEGAL: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Thousand metric tons unless otherwise specified)

Commodity 3/	1995	1996	1997	1998	1999
Cement, hydraulic	694 4/	811 4/	854 4/	1,000	1,000
Clays, fuller's earth (attapulgitic)	120	100	80	80	80
Petroleum:					
Natural gas thousand cubic meters	110,000	56,600	56,000	56,000	56,000
Crude oil thousand 42-gallon barrels	2	1	1	1	1
Refinery products do.	2,500	2,500	6,000 r/	6,000 r/	6,000
Phosphate rock and related products:					
Calcium phosphate-based fertilizers	160	160	160	160	160
Crude rock:					
Aluminum phosphate	30	30	20	20	20
Calcium phosphate	1,500	1,340	1,565 r/ 4/	1,478 r/ 4/	1,800
Phosphoric acid	274	300	300	300	320
Salt	120	120	120	139 r/	130

r/ Revised.

1/ Estimated data are rounded to no more than three significant digits.

2/ Includes data available through March 21, 2001.

3/ In addition to the commodities listed, Senegal produced clays, sand and gravel, and stone for local construction purposes, artisanal gold, and limestone for cement. Information is inadequate to make reliable estimates of output levels.

4/ Reported figure.