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# **SEA-BED MINERAL RESOURCE DEVELOPMENT**

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UNITED NATIONS

Department of International Economic and Social Affairs

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**UNITED NATIONS**

**New York, 1982**

**NOTE**

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UNITED NATIONS PUBLICATION

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1. In early 1980, the Department of International Economic and Social Affairs of the United Nations Secretariat issued a publication 1/ presenting an overview of the latest developments in sea-bed mineral resource activities. The document included a set of tables reflecting what was known at that time (mid-1979) about the activities of the pioneers in the field of sea-bed mining. The tables presented information on the pioneer groups, including the year of formation, the country of registration, the head office, the composition of the group, the shares of participation, and brief profiles of participants and service contractors, if any.

2. Since 1979, significant changes have taken place which warrant the issuance of an addendum updating the information contained in the previous tables and reflecting the current situation and composition of the pioneer groups. The present addendum reflects all information available to the United Nations Secretariat as of April 1982. 2/

3. To the six groups included in the original tables, three State programmes have been added at this time. Therefore, the set of tables now lists nine entities engaged in sea-bed mining pioneer activity: four private industry groups - the Kennecott Group, Ocean Mining Associates, Ocean Management, Incorporated, and the Ocean Minerals Company; two enterprises launched by France and Japan - L'Association française pour l'étude et la recherche des nodules (AFERNOD) and the Deep Ocean Minerals Association (DOMA); and three State-sponsored programmes in the Union of Soviet Socialist Republics, India and China.

4. The information contained in the present addendum was obtained from representatives of the companies that have invested in pioneer activities, delegations to the eleventh session of the Third United Nations Conference on the Law of the Sea, and published reports. The information on recent developments in India is based on exchanges of correspondence with S. Z. Qasim, Secretary of the Department of Ocean Development of the Government of India, and V. V. R. Varadachari, Director of the National Institute of Oceanography at Goa, and on a statement made by Jagan Nath Kaushal, Minister of Law, Justice and Company Affairs, in a plenary meeting of the Third United Nations Conference on the Law of the Sea on 31 March 1982, and on published sources. The information on activities in the USSR was provided by S. Kozyrev, Chairman of the USSR delegation to the Third United Nations Conference on the Law of the Sea, in a letter dated 6 April 1982 to the President of the Conference. The source of the information for activities in China is a letter dated 19 April 1982 to the President of the Conference from Liang Yufan, Chairman of the Chinese delegation to the Third United Nations Conference on the Law of the Sea.

5. Although every effort has been made to verify the information contained in the tables, owing to the proprietary nature of some of the information and the changing nature of some of the pioneer groups, some of the data may be subject to correction or may vary over a period of time.

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1/ Sea-Bed Mineral Resource Development: Recent Activities of the International Consortia (United Nations publication, Sales No. E.80.II.A.9).

2/ The 1980 document was published in English, French and Spanish only; the present addendum, owing to the widespread interest shown in it, is being issued in all six official languages of the United Nations.

6. The earlier report as well as the present addendum were prepared by the Ocean Economics and Technology Branch of the Department of International Economic and Social Affairs under a general mandate in the field of marine affairs laid down in the resolutions of United Nations governing bodies since 1966. 3/ Specifically in the field of sea-bed minerals, these studies are responsive to interest expressed by both the General Assembly and the Economic and Social Council in various aspects of sea-bed mineral resource exploitation and to accompanying directives from these bodies to provide information periodically on current developments in this area. 4/

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3/ Among these resolutions, the following may be cited as the most important: General Assembly resolutions 2172 (XXI) of 6 December 1966 and 2414 (XXIII) of 17 December 1968; and Economic and Social Council resolutions 1112 (XL) of 7 March 1966, 1380 (XLV) of 2 August 1968, 1537 (XLIX) of 27 July 1970, 1641 (LI) of 30 July 1971, 1802 (LV) of 7 August 1973 and 1970 (LIX) of 30 July 1975.

4/ For example, in resolution 2414 (XXIII), the General Assembly, inter alia, requested the Secretary-General "to pursue the task of collecting and disseminating available information regarding the mineral and other resources of the sea-bed and ocean floor beyond the limits of national jurisdiction ...". In resolution 1380 (XLV), the Economic and Social Council requested the Secretary-General "to follow closely new developments which may occur in fields of marine mineral resources exploration, evaluation and exploitation beyond the continental shelf and the possible implications thereof ...".

Summary tables of major sea-bed mining pioneers

1. Kennecott Consortium

Year of formation	Country of registration	Head office	Service contractor
January 1974	Unincorporated	-	-

COMPOSITION OF CONSORTIUM

Participants	Parent company	Country of origin of parent company	Share of participation (percentage)	Major activities of parent company
Kennecott Corporation	Sohio*	United States	40	Production and marketing of oil, coal and other minerals
RTZ Deepsea Enterprises, Ltd.	Rio Tinto-Zinc Corporation, Ltd.	United Kingdom	12	International mining company in aluminium, copper, gold, lead and zinc
Consolidated Gold Fields, PLC	Same	United Kingdom	12	International mining finance company with major interests in gold
BP Petroleum Development, Ltd.	British Petroleum Company, Ltd.	United Kingdom	12	Major oil company with other mineral interests
Noranda Exploration, Inc.	Noranda Mines, Ltd.	Canada	12	Mining and metallurgy of copper, lead and zinc
Mitsubishi Group	Mitsubishi Corporation Mitsubishi Metal Corporation Mitsubishi Heavy Industries, Ltd.	Japan	12	General trading company, mining, heavy industry

\* BP owns majority stock in Sohio.

## 2. Ocean Mining Associates

Year of formation	Country of registration	Head office	Service contractor
May 1974	Partnership registered in Virginia, United States	Gloucester Point, Virginia	Deepsea Ventures, Inc. (Gloucester Point, Virginia)

### COMPOSITION OF CONSORTIUM

Participants	Parent company	Country of origin of parent company	Share of participation (percentage)	Major activities of parent company
Essex Minerals Company	United States Steel Corporation	United States	25	Steel manufacturing and fabrication
Union Seas, Inc.	Union Minière S.A.	Belgium	25	International mining company, active in Belgium, Canada, United States, Australia
Sun Ocean Ventures	Sun Company, Inc.	United States	25	Non-operating company in oil and gas
Samim Ocean, Inc.	Ente Nazionale Idrocarburi (ENI)	Italy	25	Italian state oil company, engaged in exploration, production and marketing of oil

### 3. Ocean Management Incorporated

Year of formation	Country of registration	Head office	Service contractor
February 1975	Incorporated in the United States	Administrative office in New York, New York	-

#### COMPOSITION OF CONSORTIUM

Participants	Parent company	Country of origin of parent company	Share of participation (percentage)	Major activities of parent company
Inco, Ltd.	Same	Canada	25	The largest producer of nickel in the world; also engaged in batteries and formed metal products
AMR (Arbeitsgemeinschaft Meerestechnisch- gewinnbare Rohstoffe)	Metallgesellschaft AG			Mining, refining, fabricating, and trading of metals
	Preussag AG	Federal Republic of Germany	25	Non-ferrous metals, coal and petroleum, Red Sea muds development
	Salzgitter AG			Holding company in steel making and shipbuilding
SEDCO, Inc.	Same	United States	25	Contract drilling and support operation for mainly off-shore oil
Deep Ocean Mining Company, Ltd. (DOMCO)	23 companies	Japan	25	Including trading, mining, and manufacturing companies and banks



#### 4. Ocean Minerals Company (OMCO)

Year of formation	Country of registration	Head office	Service contractor
November 1977	United States partnership	Mountain View, California	

#### COMPOSITION OF CONSORTIUM

Participants	Parent company	Country of origin of parent company	Share of participation* (percentage)	Main activities of parent company
Amoco Ocean Minerals Company	Standard Oil of Indiana	United States	30.7	Oil company
Lockheed Systems Company, Inc.	Lockheed Aircraft Corporation	United States	30.7	Production of aircraft, missiles and spacecraft
( Lockheed Missiles and Space Company, Inc.				
( (subsidiary of Lockheed Aircraft Corporation)		United States		
(				
( Billiton B.V. (a Netherlands company of the Royal Dutch/Shell group)		Netherlands	30.7	Billiton is engaged world wide in all stages of the mineral industry; the Royal Dutch/Shell group is a group of companies in the oil, chemicals, coal and minerals industries and related industries
(				
Ocean Minerals, Inc. (		United States		
(				
( BKW Ocean Minerals BV (a Netherlands subsidiary of the Royal Bos Kalis Westminster Group, NV)		Netherlands	7.9	The Royal Bos Kalis Westminster Group is mainly engaged in dredging, land reclamation and civil engineering

\* Shares of participation are as of February 1982. It is possible that these shares may vary over a period of time.

5. Association française pour l'étude et la recherche des nodules (AFERNOD)

Year of formation	Country of registration	Head office	Service contractor
1974	France	Paris	

COMPOSITION OF CONSORTIUM

Participants	Major activities
Centre national pour l'exploitation des océans (CNEXO)	French public corporation - research and development in oceanology; living and mineral resources; environment; offshore and under-water technology; energy
Commissariat à l'énergie atomique (CEA)	National centre for atomic energy Remote control equipment and minerals processing
Société métallurgique le nickel (SLN)	Production and processing of nickel
Chantiers de France-Dunkerque	Shipbuilding, heavy industry, engineering and offshore construction

6. Deep Ocean Minerals Association (DOMA)

Year of formation	Country of registration	Head office	Service contractor
March 1974	Japan, as a public corporation	Tokyo	-

COMPOSITION OF ASSOCIATION

MEMBERS		MEMBERS	
C. Itoh and Comany, Ltd.	)	Hitachi Shipbuilding and Engineering Company, Ltd.	)
Marubeni Corporation	)	Ishikawajima-Harima Heavy Industries Company, Ltd.	)
Mitsubishi Corporation	) trading	Kawasaki Heavy Industries Company, Ltd.	)
Mitsui and Company, Ltd.	) companies	Mitsubishi Heavy Industries Company, Ltd.	) shipbuilding
Nichimen Company, Ltd.	)	Mitsubishi Heavy Industries, Ltd.	) and heavy
Nissho Iwai Corporation	)	Mitsui Engineering and Shipbuilding Company, Ltd.	) industries
Sumitomo Corporation	)	Nippon Kokan K.K.	)
Dowa Mining Company, Ltd.	)	Sumitomo Heavy Industries, Ltd.	)
Furukawa Company, Ltd.	)	Ebara Corporation	)
Japan Metals and Chemicals Company, Ltd.	)	Meidensha Manufacturing Corporation	)
Mitsubishi Metal Corporation	) mining and		
Mitsui Mining and Smelting Company, Ltd.	) metallurgy		
Nippon Mining Company, Ltd.	)		
Nippon Yakin Kogyo Company, Ltd.	) companies	Kawasaki Steel Corporation	)
Nittetsu Mining Company, Ltd.	)	Kobe Steel, Ltd.	) steel
Pacific Metals Company, Ltd.	)	Nippon Steel Corporation	) companies
Sumitomo Metal Mining Company, Ltd.	)	Sumitomo Metal Industries, Ltd.	)
		Iino Kaikum Kaisha, Ltd.	)
		Mitsui O.S.K. Lines, Ltd.	) shipping
		Nippon Yusen K.K.	) companies
		The Fujikura Cable Works, Ltd.	) cable
		Sumitomo Electric Industries, Ltd.	) companies
		Nippon Electric Company, Ltd.	) electric
		Victor Company of Japan, Ltd.	) appliances
		Kyokuyo Company, Ltd.	) fisheries

## 7. Union of Soviet Socialist Republics

Research activities relating to polymetallic nodules were initiated by the Soviet entities concerned in the beginning of the 1970s and the results thereof have been made known through scientific publications.

Since 1977, competent Soviet entities have been prospecting for polymetallic nodules in various parts of the International Sea-Bed Area including the Clarion-Clipperton zone in the Pacific with a view to identifying deposits of such nodules, and surveying and evaluating certain portions of this area. At the same time, Soviet entities have been engaged in developing the technology for prospecting and exploration of polymetallic nodules as well as the mining technology. Necessary investments have been made and continue to be made in those activities.

## 8. India

India has conducted scientific research cruises in the Indian Ocean for the past decade. Exploration programmes specifically on manganese nodules began in 1980 through the national Insititute of Oceanography at Goa. In January 1981, the research vessel "Gaveshani" lifted manganese nodules from a depth of 5,000 metres in the western Indian Ocean. In addition to the cost of ships, India has invested several million United States dollars in exploration and resource assessment in the Indian Ocean.

A group of research and other institutions in India is engaged in planning and conducting a survey of a specific area in the Indian Ocean, as well as in the associated development of the technical and economic feasibility. The Council of Scientific and Industrial Research and other institutions and agencies have given high priority to the development of technology for mining, recovery, beneficiation and metallurgy of nodules under a programme entitled the All India Coordinated Project under the auspices of the Department of Ocean Development of the Government of India. India is the first among the developing countries to successfully carry out an oceanographic programme dedicated to manganese nodule exploration, according to available information.

## 9. China

Starting in 1976, the Chinese departments concerned have carried out surveying and research work relating to polymetallic nodules in several areas of the international sea-bed, including the area in the central Pacific Ocean near the equator, with a view to identifying and evaluating deposits of such nodules. Manganese nodules were collected at depths of 4,214 to 5,443 metres in 1978 and 1979.

The total investment made in these activities by the Chinese departments concerned amounts to over 80 million yuan (Renminbi), of which over 16 million yuan was used in the activities directly relating to the surveying work. These departments will continue to carry out similar activities in the future.

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