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REPORT TO THE CONGRESS

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U.S. Dependence On Imports Of Five Critical Minerals: Implications And Policy Alternatives

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At the time of the GAO study major foreign suppliers of five imported minerals-bauxite, chromium, manganese, nickel, and tin--were

--not politically motivated to withhold supplies from the United States and

--interested in obtaining as much revenue as possible from mineral exports but were limited primarily by economic forces as to the amount they could increase price.

The report contains recommendations for action by the Departments of State, the Treasury, the Interior and the Congress.

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JAN. 29, 1976



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

U.S. concern over mineral availability since the oil embargo led GAO to review the reliability of foreign sources in providing the United States an uninterrupted supply of bauxite, chromium, manganese, nickel, and tin at reasonable prices. These five minerals represent about one half of the net value of U.S. nonfuel mineral imports.

This report summarizes our analysis of the issues surrounding U.S. dependence on foreign suppliers for these non-fuel minerals.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretaries of Commerce, State, the Interior, and the Treasury; the Presidents of the Overseas Private Investment Corporation and the Export-Import Bank of the United States; and the Administrator, General Services Administration.

7 see P. 31

Thomas B. Heath
Comptroller General
of the United States

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ABBREVIATIONS

BOM	Bureau of Mines
CIEP	Council on International Economic Policy
Eximbank	Export-Import Bank of the United States
GAO	General Accounting Office
IBA	International Bauxite Association
ITC	International Tin Council
OPEC	Organization of Petroleum Exporting Countries
OPIC	Overseas Private Investment Corporation

D I G E S T

Changing world attitudes are leading countries to exercise increasingly greater control over their natural resources and to reassess their policies affecting mineral supplies and markets.

Overall, GAO concludes that at the time of its 1975 study, major foreign suppliers of bauxite, chromium, manganese, nickel, and tin were not politically motivated to withhold supplies to the United States. They desired to obtain the highest prices possible from mineral exports but were limited primarily by economic forces as to the amount they could increase those prices.

After examining the markets of the five minerals (obtained largely from foreign sources) GAO also has concluded that:

- The 1973-74 mineral shortages generally were due to insufficient processing capacity rather than the physical exhaustion of raw materials. Developing countries are demanding a greater share of new processing capacity; however, expansion in these countries will occur only if there is assurance of investment security and continued mineral flow. (See pp. 16 and 50.)
- Self-sufficiency is not an attractive alternative to imports under current technology, even though the U.S. continues to be dependent on foreign suppliers. Of the five minerals studied, the potential for production of domestic resources as an alternative to bauxite imports is the greatest; however, there are energy, environmental, and capital cost barriers. (See pp. 25 and 31.)

- Mineral embargoes are not likely if producers wish to obtain the greatest possible revenues in the long term. The fact that developed countries are important U.S. suppliers appears to limit the potential for successful embargoes. (See pp. 35, 36, and 50.)
- Mineral markets, however, are increasingly influenced by the policies of producing countries. Bauxite producers have formed the International Bauxite Association, and certain member countries have increased taxes and nationalized investments. Although increased nationalism is evident in the other four mineral markets, producing countries have not acted to restrict supplies to the United States. (See p. 37, and app. I.)
- There are numerous factors limiting the extent to which producing nations can increase prices. These include the potential for substitution, alternative supply sources, differing political-economic systems, and the abundance of world reserves of the minerals studied. (See pp. 46 and 50.)
- To help stabilize the environment of the international mineral markets, the Secretary of State should continue dialogue between producing and consuming nations, considering both the economic aspirations of producer countries as well as the desire of consuming countries to minimize raw material costs. (See p. 49.)
- Although the U.S. Government has not promoted increased mineral production and source diversification, the programs of the Overseas Private Investment Corporation have encouraged this trend and they could assume a more dynamic role in promoting mineral diversification. (See pp. 52 and 62.)
- The extent that the U.S. Government has affected foreign mining exploration and development through tax law is not clear. U.S. tax treatment of foreign source income is a complicated issue and its

effect on any one industry is difficult to isolate. (See pp. 58 and 62.)

- Economic stockpiles as protection for political supply disruptions are not needed except in the case of chromium, where the threat of a political embargo is manifested by the fact that political relationships between the U.S. and two large producers have been strained; sources are limited and reserves and resources are concentrated in only a few countries; and a supply cutoff would affect a sector of U.S. industry seriously since chromium is essential to the manufacture of stainless steel. (See pp. 78, 91, and 92.)
- Economic stockpiles to protect against price gouging and shortages would incur certain problems which need full examination. The costs of stockpiles is a major disadvantage which should be given close scrutiny and another consideration would be the impact of stockpiles on international relations. (See pp. 68, 75, and 79.)
- The United States should consider membership in international commodity agreements on a case-by-case basis, recognizing that technical problems limit the number of cases where useful accords could be reached. The Department of Commerce agreed that examination of international commodity markets on a case-by-case basis shows that the potential for formal agreements involving regulation of trade is extremely limited. (See pp. 79, 80, and 111.)

The international resource environment at the time of GAO's study prompted concern over the development of a national materials policy. Elements of a U.S. mineral policy have been addressed by numerous groups including the Paley Commission in the 1950's, the Congress in the Mining and Minerals Policy Act of 1970, the National Commission on Materials Policy in a 1973 study, and the Office of Management and Budget in 1974 in a letter response to a GAO report. (See pp. 23 and 24.)

GAO concludes that U.S. mineral policy should

- recognize that the U.S. cannot alone resolve mineral disputes but must work with other consuming countries through international forums to develop a common response to actions of producing countries and cartels;
- balance economic aspirations of producing countries and needs of consuming countries for raw materials at reasonable prices; and
- be developed, on a case-by-case basis, taking into consideration the uniqueness of individual mineral markets.

The Department of the Interior should continue research and development for domestic production and substitution for imports. However, the United States, when practical, should continue to adhere to the policy of lowest cost acquisition of minerals.

Accordingly, the Secretary of the Interior should

- stipulate that Government support for pilot projects for developing domestic resources be contingent upon Government access to industry cost data, on both domestic and foreign operations, to facilitate an accurate cost-benefit analysis and
- be prepared to justify any large-scale pilot project expansion on a cost-benefit basis. (See p. 31.)

The Department of the Interior disagreed that Government support for pilot projects should be contingent upon access to industry cost data, saying it would serve as a deterrent to beginning stages of cooperative research with industry since industry would resist efforts to obtain cost data.

The Department concurred in principle that large-scale expansion of pilot projects should be on a cost-benefit basis but believed that such expansion also needs to consider strategic, legal, environmental, and social factors. (See pp. 29 and 105.)

However, there is a need for improved information on costs of foreign operations in order to effectively evaluate the feasibility of providing continued support to pilot projects, the amount of Government import protection which may be needed, the increased energy and environmental costs associated with domestic production, and the competitiveness of domestic sources compared to foreign sources. (See p. 32.)

To stabilize the international mineral market environment, the Secretary of State should

- favor efforts to support diversification of less developed country economies through existing development assistance and financing programs,
- consider lifting trade barriers selectively against imported processed minerals from developing countries willing to conclude mutually acceptable mineral access agreements, and
- work with other consuming countries through existing forums to develop a common response to the actions of producing countries and cartels. (See p. 50.)

The State Department favors a variety of financing programs to support the diversification of less developed country economies. It also agrees that lowering trade barriers to processed materials remains a major action which the United States could take in return for acceptable understandings on access to resources.

The Department noted that it was working with other consuming countries to develop common responses to actions of producing countries. (See pp. 51 and 100.)

Recent actions taken by the Department will assist in diffusing the issues which affect the security of U.S. supply. The recent proposals by the Department at the Seventh Special Session of the United Nations General Assembly indicate that both the United States and the third world agree that the chronic instability in commodity markets has been particularly harmful to the world's poorest nations. (See p. 51.)

The Congress should explore with the Overseas Private Investment Corporation the possibilities of an expanded role for the Corporation in the diversification of U.S. supply sources. (See p. 62.)

The Corporation agreed that its program has encouraged international mineral development and that it could assume a more dynamic role in promoting mineral diversification should the Congress wish. (See p. 114.)

The Congress should commission the Department of the Treasury to evaluate the effect of current tax code provisions on international mining investment. (See p. 62.)

The Treasury believed that a survey of the issues and a qualitative assessment of the effects of income tax rules would serve a useful purpose in evaluating sundry stockpiles and "capacity storage" proposals. The Treasury suggested that the Congress limit the study to specific minerals, provide sufficient reporting time, and develop the mandate details with representatives of executive agencies. (See p. 103.)

With regard to changes in the U.S. tax code, the Congress should be cognizant of tax code changes tending to deter foreign mining investment when domestic self-sufficiency is not a practical alternative. (See pp. 61 and 62.)

CHAPTER 1

INCREASED CONCERN OVER THE

AVAILABILITY OF U.S. MINERAL IMPORTS

The oil embargo emphasized U.S. dependency on oil imports and the ability of foreign suppliers to disrupt a commodity market. This political use of economic resources has paved the way for attempts at a worldwide economic realignment, based on the control and distribution of all natural resources. As the impact of the oil crisis on the American economy deepened, concern grew as to the continued availability of the Nation's imports of other minerals necessary for a highly industrialized society.

Excluding oil, in 1974 the United States imported more than 50 percent of its supply of 21 minerals, and at least 20 other minerals were imported in less significant portions. U.S. imports of raw and processed mineral materials were valued at \$42 billion in 1974; however, \$24 billion of this total represented imports of crude oil, refined petroleum, and natural gas. Many imported minerals were in short supply during 1973 and 1974 because of high worldwide demand, and the prices of many increased.

Peak periods of world demand, such as that experienced beginning in 1971 and continuing through 1973, provided an ideal climate for exercising producer leverage. In some markets, actions by producer countries raised the question of whether the United States might be subjected to other cartel action by exporting countries, similar to that experienced during the oil crisis. For example, the March 1974 formation of the International Bauxite Association (IBA) by major bauxite-producing countries (Australia, Jamaica, Surinam, Guyana, Guinea, Yugoslavia, and Sierra Leone) created concern about whether these countries would continue to be a reliable source of bauxite at reasonable prices. In Guyana, U.S. industry's bauxite investments have been nationalized, and in Jamaica and other supplying countries taxes and royalties on bauxite exports have been increased.

In view of the overall situation, we made this review to determine the reliability of foreign sources in providing the United States an uninterrupted supply of five critical nonfuel minerals at reasonable prices. Both political and economic issues relating to the security of supply of these minerals, as well as the economic determinants of price, are addressed in this report and include

- the adequacy of world mineral resources to meet world demand,
- the alternatives to U.S. dependency on foreign sources,
- the chances of a politically or economically motivated embargo against the United States,
- the role U.S. private industry has played in foreign mineral supply, and
- the role of the U.S. Government in mineral supply.

Generalizations about economic and political factors of foreign mineral supply can be misleading because of the many different factors associated with the commodities and their respective markets and countries of origin. Therefore, we selected a case study approach concentrating on bauxite, chromium, manganese, nickel, and tin.

These five minerals--costing about \$1.1 billion--represented nearly one-half of the net value (the difference between imports and exports) of U.S. nonfuel mineral imports in 1973. All five minerals are considered essential to a highly industrialized society. The United States relies on imports for its supply of each because domestic production has not been a substantial supply source for decades. The Nation's dependency on these imports is illustrated in the following table, which shows U.S. imports as a percentage of U.S. consumption in 10-year intervals from 1941 through 1971 and for 1973.

	<u>U.S. Mineral Imports</u> <u>As a Percentage of Consumption</u>				
	<u>1941</u>	<u>1951</u>	<u>1961</u>	<u>1971</u>	<u>1973</u>
Bauxite	65	72	107	79	85
Chromite	139	118	111	119	67
Manganese	131	93	125	89	70
Nickel	(a)	118	107	110	97
Tin	164	102	98	96	87

^aNot available.

In certain cases these percentages are conservative. For example, in 1973 U.S. chromite imports were less than consumption because U.S. industry used its inventories and relied more on Government stockpile sales. In other years imports have exceeded consumption, due in part to Government stockpile purchases and industry stock accumulation.

The case study minerals are used in nearly every element of modern American life. For example, it is not possible under current technology to produce steel economically without manganese or to produce stainless steel and many specialty steels without chromium. Nickel is used extensively in this country as an alloy in stainless steel and other metal products because it confers special characteristics to the end products. Bauxite is the only economically feasible source for aluminum, whose uses in the American economy are almost infinite. The United States is the free world's largest tin consumer and uses it mostly as solder and as a steel coating.

Recognizing the need for emergency supplies of raw materials, the Government has stockpiled strategic and critical materials to protect the United States against dangerous and costly dependence upon foreign sources of supply in a period of national emergency. Many factors are considered in the determination of stockpile policy. Some of the principal factors are: the nature of a potential conflict (e.g., the length and magnitude of possible wars, the number of fronts on which a conflict might be fought, etc.); the availability of imports; the possibility of foreign supply disruption; the amount that domestic production can be expanded; and the extent to which civilian consumption can be restricted by austerity measures.

As of September 30, 1974, the total market value of the U.S. strategic stockpile was about \$8.3 billion, of which approximately \$4.1 billion was made up of the five case study minerals. Because of the concern over the possibility of supply restrictions by foreign producers, there has been dialogue on the possible use of the strategic stockpile as an economic buffer stock. This possibility contributed to the selection of these five minerals for case study.

In September 1974 the Congress established the National Commission on Supplies and Shortages to identify and evaluate material and agricultural shortages. The Commission was also to report on existing governmental policies affecting supply, economic stockpiling, and the development of a shortage information system. Enabling legislation placed a March 30, 1975, reporting deadline on the Commission. Because of delays in organizing, the deadline was extended by joint resolution to March 31, 1976. Appointments to the Commission were completed on September 8, 1975.

CHAPTER 2

LIMITS ON WORLD RESOURCES

Concern over the ability of the world resource base to keep pace with world consumption has been the subject of major Government study since World War II. In the early 1950s President Truman established the President's Materials Policy Commission (Paley Commission) due to concern over the materials supply shortages experienced during World War II and the Korean War. In October 1970 the Congress established the National Commission on Materials Policy under title II of the Resource Recovery Act (Public Law 91-512), to "make recommendations on the supply, use, recovery, and disposal of materials." Both Commissions addressed the ability of world resources to keep pace with world demand and generally concluded that world resources, although theoretically finite, should be considered adequate when taken in context with a number of factors, including cost, price, technology, and time.

Short supply for many commodities in 1973 and 1974 again prompted concern by some observers that world resources were being depleted at such a rate that industrialized societies would run out of raw materials. However, others saw this as an accelerated short-term cyclical demand period temporarily outstripping mining and processing capacity. In the period 1971-74, the world's economies went through a complete economic cycle of slow growth, expansion, and major recession.

According to the December 1974 Council on International Economic Policy (CIEP) special report on critical imported materials, resource depletion forecasts do not stand up to close scrutiny. The report concluded that supporters of resource exhaustion theories have neither recognized prices as a motive to increase mineral reserves nor as a motive to economize on used material resources, develop substitutes, or recycle. Another weakness in scarcity forecasts is that they are often based on available proven reserves, ignoring the continuing development of new reserves.

There appears to be general agreement that the shortages in 1973 and 1974 resulted primarily from productive capacity not keeping pace with demand, rather than from inadequacy of the resource base. The world mineral markets in general have been marked by oversupply and overcapacity for several years, with declining price trends which acted as a disincentive to new investment. This lack of new investment, combined with the economic boom beginning in 1971 in the major consuming areas of the world (notably the United States, Europe, and Japan), created tight supply and higher prices in 1973 and 1974.

Uncertainties over mining policies of many countries, particularly in the less developed countries, further acted as disincentives for new investment. Mineral investment has been primarily undertaken by large corporations from developed economies, such as the United States, and many of these corporations hesitate to finance new foreign investment because of high risks. In 1973 approximately 80 percent of new exploration investment for nonfuel minerals was made in four developed countries. Also, increased costs due to higher oil prices have canceled or postponed some plans for new investments in foreign mining, and in some cases uncertainties about domestic environmental requirements have inhibited expansion of U.S. processing capacity.

THE RESOURCE BASE

Predictions of resource exhaustion are often based on depletion of available proven reserves (reserves are resources that can be economically mined at current prices and technology). However, such predictions have not recognized that reserves represent available supply in the short term and that in the long term the reserve base is continually being expanded. As the CIEP report points out, proven reserves are constantly increasing through price changes, discovery of new deposits, and development of new technology. World reserves are described in the June 1973 final report of the National Commission on Materials Policy as only the "tip of the iceberg" in comparison with world resources.

According to a December 1974 report, participated in by the Brookings Institution, entitled "Trade in Primary Commodities: Conflict or Cooperation?", nothing supports the claim that in the foreseeable future (through the end of this century) the world will be threatened by a mineral shortage. Many other experts in the field support this opinion. For example, in July 1974 a vice president of the Charles River Associates, Incorporated, an economics research firm, testified before the Subcommittee on Economic Growth of the Joint Economic Committee that evidence suggests no important nonenergy mineral will be in scarce supply in the foreseeable future.

For the case study minerals, the world resource base is considered adequate. World reserves of bauxite, chromite, manganese, nickel, and tin, expressed in terms of 1973 production, represent world demand through this century, as shown in the following chart. According to the Bureau of Mines (BOM), world production should be used as an estimate of world consumption since world consumption data is difficult to determine precisely.

World Reserves In Terms of
1973 World Production By Country

<u>BAUXITE</u>		<u>CHROMITE</u>		<u>MANGANESE</u>		<u>NICKEL</u>		<u>TIN</u>	
<u>Country</u>	<u>Years</u>	<u>Country</u>	<u>Years</u>	<u>Country</u>	<u>Years</u>	<u>Country</u>	<u>Years</u>	<u>Country</u>	<u>Years</u>
Australia	73	South Africa	165	South Africa	91	New Caledonia	21	Indonesia	10
Guinea	51	Rhodesia	82	Australia	14	Canada	11	Thailand	5
Jamaica	15	USSR	3	Gabon	9	Other	35	Malaysia	4
Surinam	7	Other	4	Brazil	4			Other	24
Guyana	2			Other	129				
Other	<u>79</u>		—		—		—		—
TOTAL:	227		254		247		67		43

Consistent with our discussion of mineral reserve development, the preceding chart is limited in that it is based on constant 1973 reserves and consumption estimates. World demand can be expected to increase; however, future price relationships will also stimulate new discovery and technology--encouraging development of additional reserves.

For the case study minerals, the known reserve base in 1973 was greater than it was reported to be in 1952 by the Paley Commission. The following table illustrates the long-term development of mineral reserves.

Increase in Known World Reserves

of Case Study Minerals (note a)

	<u>1952</u>	<u>1973</u>
	(million long tons)	
Bauxite	1,470	15,000
Chromite	302	^b 1,660
Manganese	237	2,670
Nickel	13.8	31.3
Tin	5	7.9

^aFree world reserves.

^bReserves of the Philippines, Rhodesia, South Africa, and Turkey; estimated to be 98 percent of free world total.

Also, much of the earth's nonfuel mineral resource base is virtually untapped. According to a November 1973 International Bank for Reconstruction and Development paper, terrestrial mineral reserves are considered to be divided evenly between developed and developing market economies (about 35 percent in each, with centrally planned economies having about 30 percent). But it is generally accepted that the developing countries contain a substantial portion of unexplored mineral resources. In addition, the ocean floor and arctic regions contain vast mineral resources which could become a reserve base of the future.

There are numerous mineral deposits in the earth's crust beneath the ocean. There is currently limited shallow ocean mining, and the technology is under development to extract from the deep ocean floor. Future production rates will depend on demand, the availability of land-based resources, and the cost of extracting minerals from the oceans compared with tapping land-based deposits.

Much of the interest in ocean mining is centered around manganese "nodules" from the world's seabeds. Nodules are small, potato-sized pellets, deposited at depths of 13,000 to 16,000 feet and containing manganese, copper, nickel, and cobalt.

Long-term supply disruptions would add impetus to seabed recovery of minerals. According to BOM, ocean mining is possible by 1985. There is, however, concern that seabed mining may not be economically competitive with surface mining because it is much more energy intensive.

Many developing countries view the potential of ocean mining as a threat to reduce their export earnings. They are concerned over the "exploitation" of the sea's resources without an international regime to safeguard their interests.

A major obstacle to large-scale ocean mining is the resolution of several international legal issues concerning maritime law. Such issues include national security and economic interests in moving vessels on, over, and under the oceans, as well as fishing and mining the deep seabed. Because of these and other issues surrounding the increased use of the oceans by all nations, the Third United Nations Law of the Sea Conference was convened in Caracas, Venezuela, from June through August 1974 and another session was held from March to May 1975 in Geneva.

Neither session resulted in any concrete agreements on law of the sea issues, and a third round was scheduled for March 1976. Large-scale commercial mining of the ocean seabeds is not expected until these international issues are

resolved. Our March 1975 report entitled, "Information on the United States Ocean Interest Together With Positions and Results of the Law of the Sea Conference at Caracas" (ID-75-46), addresses these issues in greater detail.

MINERAL PRODUCTION:
A HISTORICAL PERSPECTIVE

Some have looked to shortages as a warning, believing that a geometric growth in demand will completely deplete the earth's nonrenewable resources. Although increasing demand will undoubtedly add new constraints to the world material system, past experience shows that, if required, new resources or alternative materials will be developed to meet market demand.

During 1964 to 1973, world production of four of the five case study minerals showed a steady upward trend. As shown in the chart on the following page, world production for bauxite, chromium, manganese, and nickel increased 131 percent, 62 percent, 35 percent, and 76 percent, respectively.

The chart also reflects a comparatively stagnant tin industry. Tin is highly substitutable and world tin production is periodically restricted by the International Tin Council (see pp. 21, 45, and 76) in an effort to bring world production and consumption into balance to maintain prices.

During the same period, U.S. consumption more than doubled for bauxite and increased by about 28 percent for manganese. U.S. consumption of chromium, nickel, and tin showed relatively little change.

BEST DOCUMENT AVAILABLE

U.S. Consumption of Selected Minerals in Relation To
World Production for 1964 to 1973

	<u>BAUXITE</u>			<u>CHROMIUM</u>			<u>MANGANESE</u>		
	<u>World</u> <u>production</u> (note a)	<u>U.S.</u> <u>consumption</u>	<u>Percentage</u>	<u>World</u> <u>production</u> (note b)	<u>U.S.</u> <u>consumption</u>	<u>Percentage</u>	<u>World</u> <u>production</u> (note b)	<u>U.S.</u> <u>consumption</u>	<u>Percentage</u>
1964	7,244	2,888	(40)	1,474	547	(37)	7,979	1,216	(15)
1965	8,630	3,275	(38)	1,708	515	(30)	8,800	1,373	(16)
1966	9,431	3,903	(41)	1,550	546	(35)	8,981	1,353	(15)
1967	10,493	3,756	(36)	1,635	421	(26)	8,278	1,207	(15)
1968	10,631	4,194	(39)	1,736	451	(26)	8,597	1,150	(13)
1969	11,917	4,328	(36)	1,814	475	(26)	9,285	1,317	(14)
1970	13,091	4,071	(31)	2,050	482	(24)	9,044	1,327	(15)
1971	14,396	4,577	(32)	2,184	374	(17)	9,998	1,170	(12)
1972	15,043	5,315	(35)	2,184	506	(23)	10,012	1,366	(14)
1973	16,710	6,242	(37)	2,386	543	(23)	10,738	1,554	(14)

6

	<u>NICKEL</u>			<u>TIN</u>		
	<u>World</u> <u>production</u> (note b)	<u>U.S.</u> <u>consumption</u>	<u>Percentage</u>	<u>World</u> <u>production</u> (note c)	<u>U.S.</u> <u>consumption</u>	<u>Percentage</u>
1964	409.0	132.1	(32)	193	59	(31)
1965	468.3	190.4	(41)	201	59	(29)
1966	440.1	228.8	(52)	208	60	(29)
1967	494.8	182.4	(37)	214	58	(27)
1968	548.1	157.9	(29)	228	59	(26)
1969	532.7	149.8	(28)	226	58	(26)
1970	692.4	143.6	(21)	228	54	(24)
1971	700.6	142.1	(20)	232	50	(21)
1972	681.9	171.6	(25)	240	49	(20)
1973	721.6	192.5	(27)	232	54	(23)

^a Thousand short tons aluminum (content)

^b Thousand short tons

^c Thousand long tons

SOURCE: Bureau of Mines

Some shortages were experienced for the case study minerals during 1973 to 1974. However, except for tin, there was no evident restriction placed on the production of these minerals.

According to the March 1975 International Economic Report of the President, a post-Korean War surge in investment spending and capacity expansion in many commodity markets greatly overestimated longrun growth in demand. This surge in capacity, together with normal increases of the 1960s, exceeded the demand for these materials until the early 1970s.

This oversupply and overcapacity resulted in depressed prices in the 1960s which tended to discourage new capacity investment. For example, Dr. James C. Burrows of Charles River Associates, Incorporated, testifying before the Subcommittee on Economic Growth on July 22, 1974, said the number of projects and expected additional U.S. production capacity for aluminum had declined as follows:

	<u>Number of projects</u>	<u>Total planned additions to smelting capacity (short tons/year)</u>
1968	15	1,364,000
1969	15	1,410,000
1970	12	1,226,000
1971	7	809,000
1972	4	438,000
1973	1	120,000
1974	3	156,000

A general lack of new capacity investment in the mineral industry, coupled with the worldwide economic boom beginning in 1971 and continuing into 1973, created shortages and increased prices. By mid-1973, economic expansion began to decline, but the quadrupling of oil prices in the fourth quarter of 1973 shocked the world's economies. By mid-1974 the industrialized countries were slipping into a widespread recession and the prices of many minerals were stabilized or declining as supply exceeded demand.

The price pattern of tin illustrates this cycle (see p. 13) with the price of tin showing a steady increase from January 1973 through May 1974 and then beginning a downward slide continuing into 1975. The following section of this chapter examines more closely the price behavior for all the case study minerals since the beginning of 1973.

PRICES OF MINERALS

The relationship between market demand and available mineral supply is reflected by the mineral price, and the factors affecting this relationship vary by mineral.

In 1973 and 1974 prices rose for all five case study minerals primarily because of unprecedented world demand and the inability, and in some cases unwillingness, of the mineral-extracting and processing industries to expand production. The beneficiaries of the sellers' market were both the mining and processing industries, which have shown increases in profits, and certain host governments which increased their income through higher taxes and royalties. All five minerals had exhibited generally stable price trends before the 1973-74 period and in some cases exhibited prolonged periods of decreasing prices.

Jamaica's increased export taxes on bauxite in 1973 added an estimated 2 to 3 cents per pound to the cost of aluminum ingot. Higher energy and transportation costs also increased the price of aluminum ingot in that period. However, because of high demand and the subsequent ability of aluminum companies to pass on increased costs, U.S. aluminum companies increased their net income in 1974 from 66 to 147 percent over 1973. One U.S. aluminum company reported that its earnings in 1974 doubled, despite a switch to a last-in-first-out accounting method. Consistent with recessionary pressures, net income for the first half of 1975 for two major U.S. aluminum companies showed close to a 50 percent decrease over the same period in 1974.

An official of the Department of Commerce expressed some concern that this report might convey the impression that the 1974 aluminum ingot price increase was unjustified. The official stated that the industry was compensating for maintaining unrealistically low prices during the domestic price stabilization program while absorbing sharp price increases in labor, power, and raw materials. The 1974 increases were also limited by an agreement between the Cost of Living Council and the industry, and prices during the period never reached the levels of world markets.

According to a study of the world nickel industry by a Canadian securities analysts group, oil price increases rendered 40 percent of free world nickel production capacity uneconomical. Canadian companies are less affected by increased petroleum costs because of the availability of Canadian hydroelectric power. Traditionally, Canadian nickel companies have enjoyed reasonable profits and certain market advantages because of their access to higher grade sulfide ores. In 1974 some of these companies reported record earnings.

Tin is the only one of the five case study minerals traded on various commodity markets. The other minerals are generally purchased by contract or are from captive mines (controlled by large international organizations). Besides the increased demand, other factors which contributed to the rising tin prices in 1973 and 1974 were

- increased activity of speculators in all metal markets,
- increased fuel costs, and
- currency revaluations.

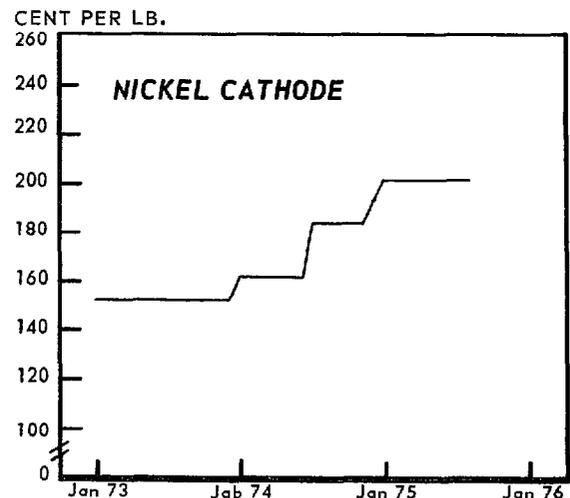
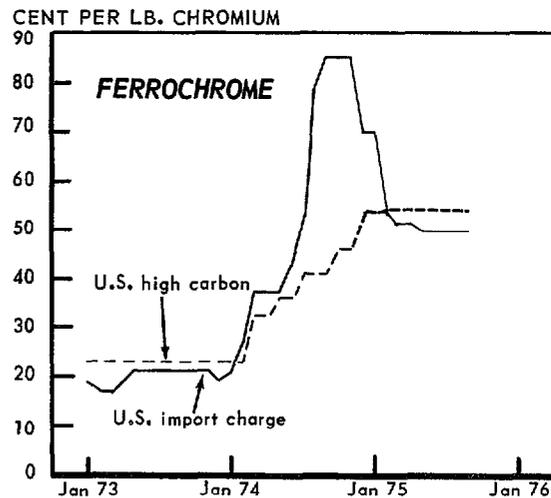
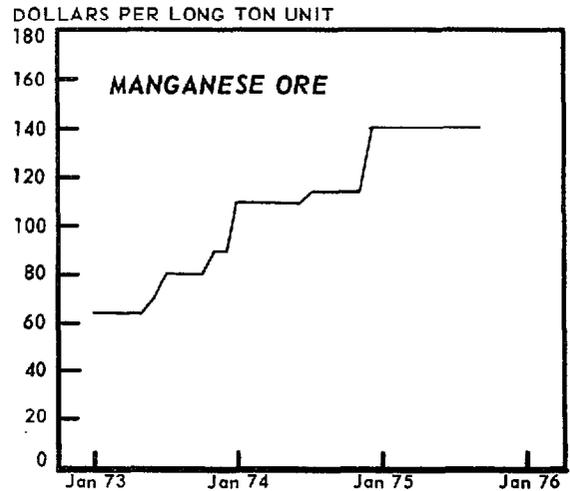
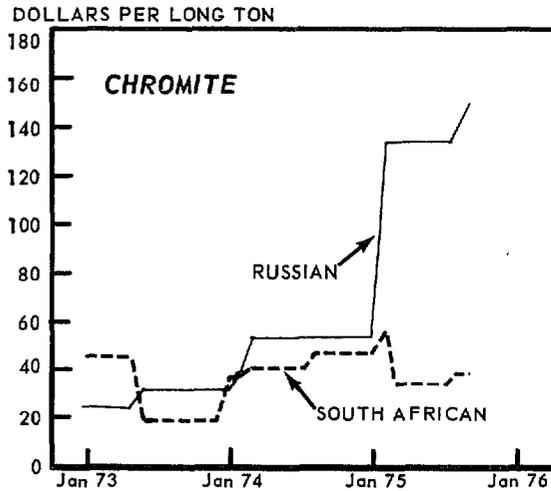
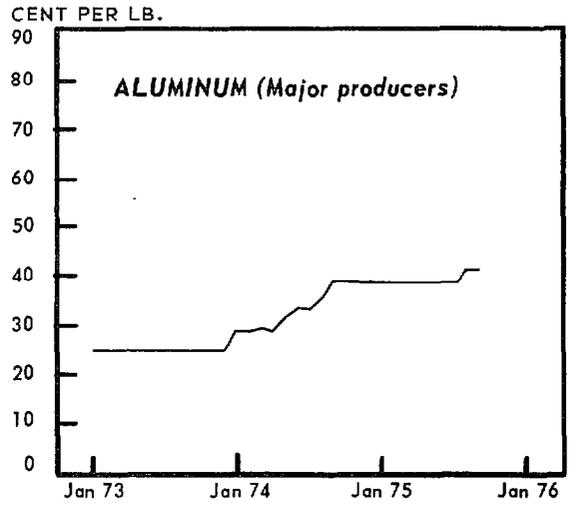
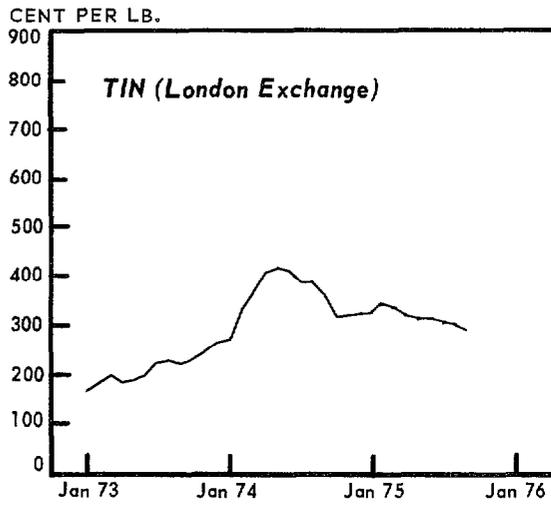
According to a 1974 U.N. Conference on Trade and Development report, the supply of manganese in the world market almost tripled in the period 1950 to 1970-72. Manganese had a downward price trend during much of that period. However, 1973 marked a major upswing in manganese demand and prices, which continued through 1974. World steel output in 1973 reached a record of about 765 million tons, a 20-percent increase over 1971. Besides this demand, increases in shipping costs pushed up the price of manganese.

In looking at chromite prices, it should be noted that generally Soviet and Rhodesian chromite is higher grade than South African. Rhodesian chromium prices are not quoted.

During the Rhodesian sanction period (1968-71), average annual chromium prices increased in real terms but were still less than the peak levels reached during the late 1950s, during which the United States accumulated chromium for Government stockpiles.

The quoted price of imported Soviet chromite doubled in 1975 from \$53 to \$58 per metric ton in January to \$130 to \$140 per metric ton in February. Some observers believe Soviet anticipation of a new Rhodesian embargo (see pp. 18 and 91) by the United States was the primary reason for this action. Others point to signs of increased internal Soviet demand as a factor.

QUOTED PRICES OF CASE STUDY MINERALS JANUARY 1973 — JANUARY 1975



Long ton - 2240 lb. Long ton unit - 1% of a long ton.

It is interesting to note that this may be a prelude to a Soviet export of ferrochrome for the first time (see p. 91).

IMPACT OF PRICE INCREASES

The Department of Commerce has developed a cost-price econometric model designed to estimate the effect of cost increases of materials on prices in various segments of the U.S. economy. The model was used with the assumption that the costs of primary aluminum and of manganese and ferroalloy ores increased 100 percent. The overall analysis showed a moderate effect on prices for the increase in primary aluminum cost and a negligible effect for the manganese and ferroalloy ores.

The Department of Commerce's Material Division expressed some concern over the possibility of attaching too much significance to the model's output. The Materials Division stated that, although it agreed that the impact of such price increases upon the economy would be small, the impact of price increases upon processing industries would be significant. In providing the model's output, we caution the reader that we have not attempted to examine the reliability of the output.

The model estimated that a 100-percent increase in primary aluminum prices would result in:

--A price impact of about four-tenths of 1 percent on the manufacturing sector as a whole. Secondary non-ferrous metals would be most heavily affected (10 percent), followed by transferred imports (9 percent), electric companies and systems (4.47 percent), and scrap and secondary goods (4.18 percent).

--A price impact of about 1 percent at the intermediate and final processing stages. At the commodity level, the largest increases would be aluminum shapes (2.3 percent), other basic organics (0.9 percent), and semifinished steel products (0.7 percent).

A 100-percent price increase in manganese ore would affect:

--The manufacturing sector only 0.0008 percent.

--The transferred imports industry most heavily (0.16 percent), followed by the real estate industry (0.04 percent), water transportation (0.03 percent), and the blast furnaces and steel mills industry (0.01 percent).

--The intermediate processing stage by 0.015 percent and the final processing stage by 0.01 percent. At the commodity level the greatest impact would be on finished steel (0.01 percent).

A 100-percent price increase in ferroalloy ores (nickel, chromite, and some other alloy ores) would cause more than a 1-percent increase in only the transferred imports industry. At the commodity level, finished steel is the only product which would increase (almost 0.01 percent).

MONITORING OF FUTURE MARKET CYCLES

In 1973 U.S. consumption of bauxite, chromium, manganese, nickel, and tin represented approximately 37 percent, 23 percent, 14 percent, 27 percent, and 23 percent of world production, respectively.

The United States is expected to continue as a major consumer. However, in planning to meet the Nation's future resource needs, we must recognize that world metal consumption outside the United States is growing faster than that inside the United States. As other developed countries further industrialize and the worldwide recession abates, increased demand will again become a more dominant force in the world minerals market. More reliable techniques will be needed to assess the probabilities of future shortages and to develop long-range policies designed to soften the impact of future supply and demand cycles.

There are numerous uncertainties concerning the international mineral market in regard to

--the extent market demand cycles are likely to be moderate or severe,

--whether capital investment in mining and processing capacity will meet anticipated demand,

--what extent resource policies and actions of foreign nations are affecting new investment and available mineral supply.

As pointed out in our April 1974 report on "U.S. Actions Needed to Cope with Commodity Shortages" (B-114824), the Government's decisionmaking process for commodities in short supply is essentially ad hoc and crisis oriented. Commodity policy formulation currently involves numerous Government agencies. The fragmentation of policy groups, market information, and alternative programs and the ad hoc approach

to shortage problems have complicated Government decision-making. The report contained a series of recommendations to executive branch departments, agencies, and policy councils concerned with commodity policy processes to improve the capability of Government to monitor and to forecast the activity of commodity markets.

More specifically, basic defects were noted in Government mineral policy planning systems limiting understanding and responses to the contemporary environment, including

--an inadequate data base and

--a limited ability to discern trends and to make predictions.

The Department of the Interior acknowledged that it was concerned that its planning, analysis, and policy formulating system for minerals was inadequate. However, Interior stated that actions were being taken to remedy the deficiencies of data collection, analysis, and policy development.

We are currently reviewing to what extent there have been improvements in responsible Government agencies' forecasting and monitoring systems and the effect on the decision-making process.

CONCLUSIONS

During 1973 and 1974 many raw materials were in short supply and prices rose. This accelerated worldwide demand period was further aggravated by oil price increases in the international market.

The shortage resulted primarily from productive capacity being outstripped by demand, rather than from exhaustion of the resource base. The shortage was encouraged by prior periods of depressed raw material prices, which inhibited new capacity investment and expansion.

Although the world raw material base in the five minerals studied is considered adequate, the base is located primarily in foreign countries. The foreign investment climate will largely determine if needed capital expansion occurs to meet demand in these industries.

CHAPTER 3

MINERAL OUTLOOK IN BRIEF

This chapter summarizes (1) each case study mineral, to give the reader a framework concerning the major issues of foreign mineral supply addressed in this report, and (2) supply-demand relationships, industry structure, and an appraisal of price movements in 1973 and 1974.

The following chart summarizes the sources of U.S. imports of the five case study minerals for 1973. The chart shows major sources of the imported raw materials of bauxite, chromite, and manganese, and of processed nickel and tin, since the bulk of these two imports take this form. Also, because the importation of processed forms of the other case study minerals is gaining importance, we have included the major sources of processed bauxite (alumina), chromite (ferrochromium), and manganese (ferromanganese).

SOURCES OF U.S. IMPORTS--1973

<u>BAUXITE</u>		<u>ALUMINA</u>		<u>CHROMITE</u>		<u>FERROCHROMIUM</u>	
Jamaica	51 %	Australia	57 %	South Africa	33 %	Rhodesia	37 %
Surinam	21	Jamaica	28	USSR	26	South	
Guyana	9	Surinam	11	Phillipines	20	Africa	35
Dominican		Other	4	Turkey	14	Japan	7
Republic	8			Rhodesia	5	Other	21
Other	11			Other	2		

<u>MANGANESE</u>		<u>FERROMANGANESE</u>		<u>NICKEL</u>		<u>TIN</u>	
Brazil	42 %	South		Canada	63 %	Malaysia	56 %
Gabon	27	Africa	36 %	Norway	8	Thailand	16
Australia	9	France	35	United		Bolivia	11
South		India	12	Kingdom	6	Indonesia	6
Africa	8	Other	17	Rhodesia	2	Australia	4
Mexico	6			Other	21	Other	7
Other	8						

ALUMINUM

Aluminum's high strength-to-weight ratio accounts for its prominent role in the construction, transportation, and electrical industries. In recent years consumption occurred most rapidly in the container and packaging industry, where aluminum competed with tin plate and plastic materials.

Aluminum is the most abundant metallic element in the earth's crust. Under current technology and prices, bauxite

is the only economical source of aluminum, and U.S. bauxite reserves represent only a fraction of domestic requirements. However, aluminum can be derived from many other lower grade aluminum-bearing resources, such as alunite, dawsonite, and clay, many of which are located in the United States. Chapter 4 examines the future potential of domestic nonbauxite resources.

In 1973 the United States imported 14 million tons of bauxite, or about 85 percent of its supply that year. Jamaica and Surinam are the major suppliers; Guyana, Guinea, Haiti, and the Dominican Republic provide lesser amounts. In addition, Australia, Jamaica and Surinam combined to provide the United States significant quantities of alumina.

The aluminum industry is dominated by six vertically integrated international companies, three of which are majority U.S. owned. Bauxite prices have historically been low and stable; however, recent IBA actions designed to increase revenues indicate that bauxite prices will rise.

Actions of producer countries to increase taxes on bauxite appear based on the desire to increase revenues, partially to meet rising import bills and at the same time to exercise greater control over their natural resources. The price of aluminum ingot increased from 29 cents to 39 cents in 1974; however, only about 2 cents was due to bauxite producer tax increases.

CHROMIUM

Two-thirds of the chromite consumed in the United States is in the metallurgical industry--primarily stainless steel. Other uses include 16 percent in the chemical industry and about 20 percent for refractory bricks for use in metallurgical furnaces. Presently there are no known substitutes for chromium in the stainless steel making process.

Chromium is mined in the form of chromite ore and is processed into ferroalloy form (ferrochromium) for metallurgical use. No chromite is mined in the United States. Known world chromite reserves are considered adequate to meet world demand through this century, but 96 percent of these are concentrated in South Africa and Rhodesia.

In 1973 chromite was imported from South Africa (33 percent), the Soviet Union (26 percent), the Philippines (20 percent), Turkey (14 percent), and Rhodesia (5 percent). Because of both international and domestic controversy over Rhodesian internal racial policies, the United States has in

recent years imported greater quantities of chromite from the Soviet Union.

In 1965 the controlling white minority of Rhodesia unilaterally declared its independence. In 1968 the United Nations adopted mandatory economic sanctions designed to bring the Rhodesian Government to terms.

The United States observed the sanctions from 1968 to 1971; however, in 1971 the Congress passed the Military Procurement Act (Public Law 92-156). Section 503 of this act, commonly referred to as the Byrd amendment, excluded Rhodesian chrome and other materials from the prohibition.

From 1968 to 1973, the Soviet Union supplied between 24 and 41 percent of U.S. chromite imports. It supplied between 14 and 24 percent from 1963 to 1967--before the Rhodesian sanctions. In 1973 Rhodesia supplied approximately 5 percent of U.S. chromite imports.

U.S. imports of processed chromite (ferrochromium) are increasing, totaling about 168,000 tons in 1973. Some domestic ferrochromium producers have found it desirable to invest in new ferrochromium capacity overseas to be nearer the raw material source and to take advantage of cheaper energy and lower overall operating costs. U.S. imports of ferrochromium from Rhodesia have increased since passage of the Byrd amendment, representing about 37 percent of total U.S. ferrochromium imports in 1973. However, the continued availability of Rhodesian imports to the United States will remain dependent on U.S. foreign policy.

MANGANESE

Manganese is required in steel making as a deoxidizing, desulfurizing, and alloying agent for which there is no known substitute. Manganese ore is processed into ferroalloy form, primarily ferromanganese, for steel production. The United States depends entirely on imports for its manganese requirements. Domestic resources are very low grade and are not economically competitive with imports.

Although there are no domestic reserves, world reserves are considered enormous. Manganese is the 12th most abundant metal in the earth's crust and is found throughout the world, including vast deposits on the ocean floor. In a special report in December 1974, the Council on International Economic Policy reported that world mining capacity is believed to exceed world production rates by 20 percent. BOM 1975 estimates show that non-Communist countries have 10-percent excess capacity.

The abundance of manganese on the world market is evidenced by its historically decreasing price trend. In the 13-year period 1957-69, the price of manganese ore, expressed in terms of constant 1973 dollars, decreased approximately 76 percent, and 1973-74 average prices were less than the peak reached in 1957 despite increased shipping costs and currency realignments. However, the price of manganese increased substantially during the period 1974-75 and has resisted the general declining tendency of metal prices.

In 1973 the United States imported about 303,000 tons of ferromanganese, as compared with imports of 95,000 tons in 1951 and 189,000 tons in 1971. Correspondingly, domestic ferromanganese production in 1951, 1971, and 1973 was 602,000, 597,000 and 538,000 tons, respectively. The economics of production generally suggest construction of new ferromanganese capacity overseas. Also, many developed-country ore producers are actively promoting foreign investment in their ferromanganese industry for the greater revenues associated with exports of processed materials.

More than one-half of world manganese trade involves short-term "free market" sales, and about 15 to 20 percent are exports from captive mines which are owned by steel producers. A major U.S. steel company has ferromanganese investments in France and South Africa, which supplied approximately 74 percent of U.S. ferromanganese imports in the period 1970-73.

In 1973 the major world producers of manganese ore were the Soviet Union (40 percent), South Africa (15 percent), Brazil (10 percent), and India (6 percent), and the major suppliers to the United States were Brazil (42 percent), Gabon (27 percent), Australia (9 percent), and South Africa (8 percent). U.S. steel companies also have major manganese-mining investments in Gabon and Brazil. The United States consumed approximately 2,140,000 tons (gross weight) of manganese ore in 1973, about 14 percent of world consumption. In the long term, manganese ore prices are expected to be stable because of the enormous world reserves and the possibility of seabed recovery. (See p. 7.)

NICKEL

Nickel is used primarily as an alloy in stainless steel, alloy steels, and other metal products. For products requiring high-temperature-strength materials there is no satisfactory substitute.

Production of nickel from domestic ores, which represents about 10 percent of U.S. primary consumption, is not

expected to increase significantly despite ongoing geological research into alternative sources. All nickel is imported in processed or semiprocessed form, and the United States imported approximately 191,000 tons in 1973.

World nickel reserves are considered adequate to meet world demand through the year 2000. Major foreign suppliers to the United States in 1973 included Canada (70 percent) and Norway, the Dominican Republic, the United Kingdom, and to a lesser extent New Caledonia. The imports from Norway and the United Kingdom are processed Canadian ores.

Canadian nickel is mined from high-grade sulfide ores through traditional shaft-mining techniques. Canadian sulfide ores represent about 60 percent of the known world sulfide reserves. Also, through technological development, economic mining of lower grade ores known as laterites is being developed in many countries, including Australia, Guatemala, New Caledonia, Indonesia, the Dominican Republic, and others. However, increased oil prices have been detrimental to the use of laterites, as about 4 times more energy is required to process laterites than sulfides.

According to the Department of Commerce, seabed nodules could contribute to the supply of nickel by the mid-1980s. A discussion of the problems associated with mining seabed nodules is contained on page 7 of this report.

TIN

U.S. consumption of primary (new) and secondary (recycled) tin increased 8 percent in 1973, the first such increase since 1968. Over 40 percent of U.S. consumption is for steel coating (tinplate) in the container industry, and tin's application as a solder is important in the electrical, transportation, construction, and machinery industries. Solder and tinplate represent about two-thirds of U.S. tin consumption.

The United States depends on imports to meet primary tin requirements. Malaysia, Thailand, Bolivia, and Indonesia provided 89 percent of 1973 imports. Almost all imported tin is in metallic or metal and concentrate forms.

According to BOM, world tin reserves and resources are more than adequate to meet world demand through the year 2000, with new reserves being exploited as dictated by price. Should pricing mechanisms be insufficient to develop new reserves to meet demand, the availability of substitute materials should minimize the impact of any possible future long-term shortage.

The International Tin Council (ITC), a producer-consumer group which began in 1956, tries to stabilize the world tin market by employing buffer stock purchases and sales to maintain market prices between floor and ceiling prices and by export controls. The United States is not a member of ITC.

Tin prices are formed by market forces on the London, Penang, Malaysia, and New York tin exchanges in addition to actions by ITC. In what was attributed to a short-term shortage, in the face of high demand, tin prices rose to record levels during 1973 and 1974 but retreated somewhat during the last half of 1974. The world tin industry is not vertically integrated and is generally privately controlled in Malaysia and Thailand and government controlled in Bolivia and Indonesia.

The tin market in 1974 was unique from other metal markets in that tin mine output rather than smelting capacity primarily determined available supply. According to BOM, there is a heavy excess capacity in tin smelting capacity. Mine output during 1974 was down despite high demand, which may have been primarily due to the mining of lower grade ores to take advantage of high prices and to ITC export controls during the first 9 months of 1973 forcing closure of mines.

CHAPTER 4

DOMESTIC PRODUCTION, SUBSTITUTION, AND RECYCLING

The oil embargo and the subsequent concern over the availability of other U.S. mineral imports prompted in some cases the advocacy of increased U.S. self-sufficiency for its resources. However, even under the high demand and price market conditions in 1972 and 1973, domestic production of the case study minerals was not cost-competitive with imports.

Without Government intervention, the determining factor in domestic development is the ability of technology to overcome the higher costs of domestic resources as compared with the costs of imports. This factor was apparent in the 1950s when the Paley Commission concluded:

"The United States must reject self-sufficiency as a policy and instead adopt the policy of the lowest cost acquisition of materials wherever secure supplies may be found: self-sufficiency, when closely viewed, amounts to a self-imposed blockade and nothing more."

The Mining and Minerals Policy Act of 1970 was intended to reduce United States reliance on nonfuel imports. Concerning U.S. mineral policy, the House report on the act states that:

"While it is not expected that the United States will ever be completely self sufficient in minerals, nevertheless our objective should be to obtain a degree of self-sufficiency consistent with the availability of our domestic resources."

The 1973 National Commission on Materials Policy study was undertaken for the purpose of developing a "national materials policy." The Commission found in its study that U.S. policy should include a reliance "on market forces as a prime determinant of the mix of imports and domestic production in the field of materials but at the same time decrease and prevent wherever necessary a dangerous or costly dependence on imports."

The administration's views on a U.S. mineral policy are contained in an October 16, 1974, letter from the Office of Management and Budget to us in response to our report entitled "Stockpile Objectives of Strategic and Critical Materials Should be Reconsidered Because of Shortages" (B-125067). The letter stated:

"While recent events have generated a goal of self-sufficiency in the energy area there is no generalized goal of self-sufficiency for other commodities. To extend self-sufficiency to all raw materials would be contrary to our efforts to encourage an open world trade system which benefits all. Moreover, it would make no economic sense for the United States or any other country to produce raw materials where production costs are considerably higher than those of foreign suppliers. Occasionally it becomes necessary to increase domestic production because of national security reasons, as in the case of petroleum."

HISTORICAL EFFORTS TO STIMULATE DOMESTIC PRODUCTION

Shortly before World War II, various Government programs were implemented to help assure an emergency supply of essential raw materials. Such programs included procuring and stockpiling chromium. Early in World War II, the Government encouraged production of domestic chrome ores by entering into lease agreements with mine owners and into contracts to purchase the ore produced. Prices were guaranteed at a fixed level during the lease period. Despite such efforts, domestic chromite production equaled only about 10 percent of U.S. requirements during World War II and the ore was of such poor quality that little was usable.

Similar programs regained impetus during the Korean conflict, including an offer-to-purchase program under which domestic chromite producers were encouraged to mine domestic ore to be placed in Government stockpiles. This program, initiated in 1951, continued until 1958, but U.S. production represented only 8 percent of U.S. consumption during that period.

Under current economic and technological conditions, domestic mining of chromite as an alternative to imports is not considered a real alternative. There are no U.S. reserves and, according to BOM, estimated resources represent only 8 percent of projected domestic cumulative demand through the year 2000.

Before and after World War II, the Soviet Union supplied more than one-third of U.S. manganese requirements. However, by 1950 it embargoed almost all manganese trade with the free world, and industry had to turn to new foreign sources. Domestic development was ruled out because it was estimated that the cost of mining domestic manganese ores was at least twice, and in some cases more than four times, as much as the cost of foreign ores. Today it would cost an estimated 10 times as much to mine domestic manganese reserves.

The United States has historically depended on primary tin imports because of a lack of an adequate domestic resource base. Despite severe foreign supply disruptions in World War II, domestic production was not considered an alternative. In 1941 BOM stated that no deposits likely to be found in the United States could supply any substantial quantity of tin even at several times the normal price. This is true today.

DOMESTIC NONBAUXITE RESOURCES
AS AN ALTERNATIVE TO BAUXITE IMPORTS

In 1972 the United States produced about one-third of the world's aluminum and imported about 85 percent of the bauxite it needed. U.S. bauxite resources are small; however, there are numerous other lower grade aluminum-bearing resources, many of which are abundant domestically. These include clay, alunite, anorthosite, shale, and dawsonite.

Underway at the time of our review was a joint BOM/aluminum industry pilot project in Boulder City, Nevada, to test and develop new approaches for recovering alumina (aluminum oxide which is refined from bauxite and then smelted into aluminum) from domestic nonbauxite resources. BOM initiated this project in fiscal year 1973 at a cost of \$250,000. In fiscal year 1975 one alumina (refractory) and nine aluminum producers signed cooperative agreements with BOM pledging \$50,000 each toward the project.

BOM funding totaled about \$700,000 in fiscal year 1974 and about \$1.2 million in fiscal year 1975. BOM also planned to include \$2 million in its fiscal year 1976 budget request for initial design of a 50-ton-per-day alumina plant and \$20 million in its fiscal year 1977 budget request to construct the project.

BOM and industry participants disagree over the project. Some industry participants believe that a 50-ton plant would be too small to meet the overall goals of the project and feel that BOM cost estimates are understated.

BOM is optimistic about the project's outcome. However, even though project costs of alumina production from domestic nonbauxite materials may prove competitive with bauxite, large-scale domestic development by industry apparently is not assured. Aluminum companies already have enormous capital investments in foreign bauxite mining and processing and would understandably hesitate to invest heavily in domestic production. According to a study by the International Economic Policy Association, building domestic plants to supply only 30 percent of U.S. 1973 alumina consumption would require a capital investment of approximately \$3 billion.

If successful, this project may set a ceiling on the price of foreign bauxite above which foreign producers would hesitate to go in fear of stimulating development of alternatives to bauxite. However, some observers believe that large-scale domestic development of nonbauxite aluminum-bearing ores is not economically feasible without Government subsidy.

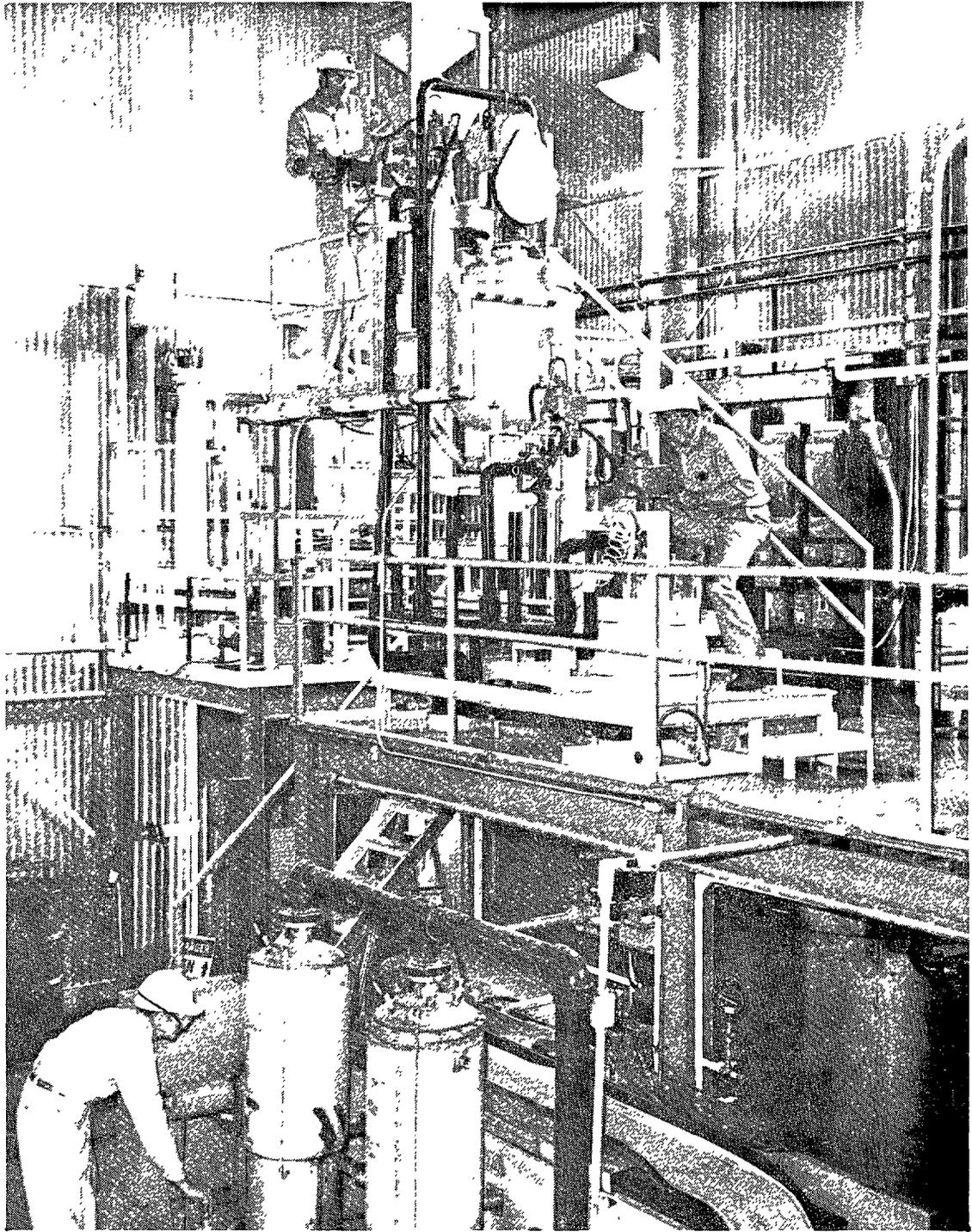
For years the Government and private industry have conducted research to develop economically minable domestic clays without favorable results. According to a BOM official, domestic clays are not likely to be cost competitive with foreign bauxite through this century unless bauxite prices dramatically increase.

Bauxite represents a very small percentage of the total costs of aluminum. According to the CIEP study on critical raw materials, a doubling of bauxite prices (from the estimated \$15 per ton at the time of the report to \$30 per ton) would add less than 10 percent to the price of aluminum metal. The small cost of the raw material in comparison with the huge capital investment costs that would be required is likely to forestall large-scale domestic development. However, should bauxite prices dramatically increase or the security of foreign aluminum investments be threatened, domestic development is an alternative.

Under current conditions Government subsidy for large-scale development would not assure such development. Such action would probably improve the bargaining positions of U.S. industry with foreign suppliers, continuing the price competitiveness of bauxite. Also, Government subsidy for large-scale development might lead to even further Government involvement. For example, foreign producers might reduce bauxite prices in periods of slack demand to the point that import duties would be necessary to protect a domestic industry. This would inhibit the ability of a domestic industry to effectively compete in the international market. In a sense this would establish a floor price.

Processes being tested in the Boulder City project are acknowledged to use much more energy than current bauxite processes. In fact, the development of new technology to reduce the high costs of energy associated with processing nonbauxite ores will apparently be the major prerequisite to successful completion of the pilot project.

The effect of any large-scale mining on the Nation's environment must also be considered. Domestic clays and other aluminum-bearing minerals are generally surface minerals available through strip mining. BOM officials told us that



Boulder City, Nevada, alumina miniplant for recovery of alumina from domestic nonbauxitic ores. The view of the plant shows the acid leaching circuit. (Credit: Bureau of Mines.)

large-scale mining may not be feasible in some areas because of strip-mining laws.

In addition, waste disposal is a problem. For example, 6 tons of Georgia high-aluminum Kaolin clays, in comparison with 4 tons of bauxite, are generally required to produce 1 ton of aluminum. Depending on the type of bauxite used, from one-third ton to 1 ton of red mud waste is produced per ton of alumina. The only practical control technology for the enormous amounts of such mud is impoundment in large diked lakes, which may range in size from 100 to 2,000 acres. According to BOM, environmental problems associated with producing alumina from clays are likely to limit development of domestic aluminum resources.

Another pilot effort to produce alumina from nonbauxite domestic resources is underway by a private consortium consisting of Earth Sciences, Inc.; Colorado Mines, Inc.; and National-Southwire Aluminum Company. The project is designed to test the feasibility of commercial recovery of alumina from alunite (a mineral containing about 37 percent alumina and 11 percent potassium sulfate). Alunite is already used as a source of alumina in the Soviet Union, and an alunite-processing plant is under construction in Mexico. Also, processing of alunite produces important byproducts--sulfated potash and sulfuric acid--which can be converted into phosphate fertilizers.

According to a July 1974 industry publication, "American Metal Market," the venture includes a \$1 million pilot plant at Golden, Colorado; nine alunite properties; and \$10 million worth of leasehold rights to phosphate deposits in southern Idaho. In testimony before the Subcommittee on Economic Growth, a representative of the venture said that alunite was competitive with bauxite even before the Jamaican tax was applied. However, according to a production costs study prepared for the Overseas Private Investment Corporation (OPIC), there are economic drawbacks to the alunite project similar to those being incurred in the BOM project. The process is believed to be a heavy user of energy, and the capital costs are quite high. According to one BOM official, the economic competitiveness of this project may be determined more by the ability to market the co-products rather than on the competitiveness of the alumina produced.

U. S. Government needs to improve its information base

At this time the Government does not have access to industrial foreign cost data necessary to state with certainty the cost difference between domestic and foreign production.

BOM believes that a requirement for industry data on foreign costs would serve as a deterrent to the initial stages of cooperative research with industry since industry would resist the efforts to obtain data.

Thus the cost estimates for foreign bauxite and alumina production contained in this report may not be valid. Under BOM's self-imposed restrictions, it will be unable to perform a valid analysis of increased energy and environmental costs, the competitiveness of pilot projects with foreign suppliers, and the degree of Government import protection which may be required to protect a domestic industry.

RECYCLING

Increased recycling is considered to have only limited potential, particularly in the short term, to increase the domestic supply of raw materials. Under current technology, many materials are not suited for recycling and, for others, recycling is not cost competitive with primary minerals under current prices. In the long term, however, recycling is a real possibility for many nonfuel minerals to augment supplies. Metal scrap is continually being regenerated, adding to secondary supply.

Recycling possibilities are determined on a case-by-case basis as determined by price and interrelated factors. For example, BOM data shows that secondary aluminum represents about 17 percent of U.S. consumption. The increased cost of energy may have been a setback to increased recycling in general. However, for aluminum, where primary production is highly energy intensive, the incentive to use scrap may increase.

The potential for secondary recovery of manganese is negligible even at substantially higher prices. According to BOM, there is no secondary industry for chromium, although stainless steel scrap contributes significantly to chrome supply. Secondary sources of nickel provide approximately 30 percent of U.S. consumption and, according to BOM, secondary recovery could be increased to 40 percent of consumption in 3 to 4 years should the price of nickel increase substantially.

On the other hand, tin recycling in the United States is estimated to represent approximately one-fourth of U.S. annual supply. However, less than 10 percent of recycled tin is used metallurgically, which is the major component of U.S. primary demand. According to BOM, there is little room for expansion of the domestic recycled tin output because of the limited use of recycled tin metallurgically.

SUBSTITUTION

In the case of most nonfuel minerals, substitution at least partially deters the long-term maintenance of high prices. However, substitution is not a viable short-term alternative to high material prices or supply disruptions. A World Bank staff study commented on the potential for long-term substitution in the nonfuel mineral area as follows:

"The possibility of substitutes represents a real threat at any time to the effective maintenance of substantially higher prices. Such substitutes can replace the basic mineral as a source for the metal, the metal itself, or the metal-containing-product altogether. (For example, bauxite can be replaced by other materials in making aluminum, aluminum can be replaced by tin in making cans, and cans can be replaced by plastic or glass containers.) Current or potential substitutes are available for the majority of minerals, among them nearly all of the nonferrous metals.

"While these assessments can be countered by arguments that some of the substitutes may be in short supply or high-priced (like plastics at this time due to the oil crunch), or that their supply too may be controllable by producers' alliances, it should be borne in mind that the field of metallurgy has historically been in the vanguard of experimentation and development of substitutes in the direction of the cheapest and most abundant raw materials. In short, the infrastructure for weathering a crisis at manageable cost within tolerable time is more sophisticated in this sector than in the energy sector. As recent events have shown, oil was grossly underpriced vis a vis substitutes; whereas in the case of almost all non-fuel minerals, the price increase at which either substitution or exploitation of lower-grade sources becomes feasible is a great deal less than it is for oil, and the process involves substantially shorter time lags."

Substitution possibilities vary on a mineral-by-mineral basis as influenced by price, the level of technology, time, and other economic interrelationships. In regard to our case study minerals, it is considered that substitution of other metals for manganese and chromium in certain steel applications is not practical under current technology. We noted that the National Academy of Science is conducting a study on substitution of chromium.

On the other hand, domestic demand for nickel can be reduced through the increased use of chromium, manganese, molybdenum, and cobalt; this potential depends primarily on relative price movements. Substitution for aluminum is also considered a function of the relative price of aluminum. According to the CIEP report, if the relative price of aluminum increased significantly, substitution would eventually occur through use of such materials as copper, steel, zinc, wood, and plastics. Of the five case study minerals, tin is one of the more susceptible to substitution. A major use of tin is in tinsplate, and many materials such as aluminum, plastics, glass, and paper could be substituted for tinsplate depending on the availability of substitutes and price.

CONCLUSIONS

Domestic production of tin, chromium, nickel, and manganese is not an attractive alternative to imports under existing economic conditions and technology. In some cases domestic resources are not sufficient to meet U.S. demand. In other cases resources are sufficient but of low grade, and technology has not been able to overcome high production costs. Domestic production of nonbauxite domestic resources holds potential as a future alternative to bauxite imports. However, there are energy and environmental cost barriers to be overcome as well as the need for large capital investment. These economic realities dictate a continuing interdependency between the United States and both developed and developing supplier countries.

We believe that the United States, when practical, should continue to adhere to the policy of lowest cost acquisition of minerals and we endorse research designed to develop technology toward economical domestic production, substitution, and recycling.

RECOMMENDATIONS

We recommend that the Secretary of the Interior:

- Stipulate that Government support for ongoing pilot projects for domestic resource development be contingent upon Government access to industry cost data, on both domestic and foreign operations, to facilitate an accurate cost-benefit analysis.
- Be prepared to justify any large-scale pilot project expansion on a cost-benefit basis.

AGENCY COMMENTS

The Department of the Interior concurred with our recommendation for continued research and development efforts for domestic production and substitution for imports. It also believed that expansion of large-scale projects needs to consider the strategic, legal, environmental, and social factors as well as the cost benefits associated with these projects.

As discussed on page 29, Interior believed that a requirement for cost data from industry should not be made because it would serve as a deterrent to research and development.

We believe that there is a need for improved information on costs of foreign operations in order to perform an effective evaluation of (1) the feasibility of providing continued support to pilot projects, (2) the amount of Government import protection which may be needed, (3) the increased energy and environmental costs associated with domestic production, and (4) the competitiveness of domestic sources compared to foreign sources.

CHAPTER 5

THE ECONOMICS AND POLITICS OF MINERAL SUPPLY

The new assertiveness of developing nations in pursuing their perceived self-interests is¹ suggested by a speech made by Algerian President Boumediene,¹ in which he stated:

"The OPEC [Organization of Oil Exporting Countries] action is really the first illustration, and at the time the most concrete and the most spectacular illustration, of the importance of raw material prices for our countries, the vital need for the producing countries to control the levers of price control, and lastly, the great possibilities of a union of the raw-material producing countries."

Increased control over natural resources is becoming a major objective of developing countries in their efforts to gain a worldwide economic realignment between industrialized and developing countries. The prospect of greater U.S. reliance on imported minerals to meet increasing consumption requirements--at a time when producer countries are demanding greater returns from their extractive industries--has created uneasiness within U.S. Government and industry circles. We believe the major concerns are (1) U.S. susceptibility to supply embargoes as a restriction on U.S. foreign policy options and (2) susceptibility of the U.S. economy to inflationary pressures from producer country efforts to increase mineral export revenues.

With these concerns in mind, we assessed the economic and political conditions affecting the security of the U.S. supply of the five case study minerals. Briefly, we found at the time of our review that major suppliers generally

--were not politically motivated to withhold supplies from the United States and

--were inclined to maximize revenues from mineral exports but were limited by economic factors as to the amounts they could raise prices.

¹Houari Boumediene, President, The Council of Revolution of Algeria, speech at the Sixth Special Session of the U.N. General Assembly on April 10, 1974.

It appears that foreign governments would use means other than embargoes to express disapproval with U.S. foreign policy, and with only great reluctance would they incur the economic disruptions resulting from embargo action. Many less-developed-country producers could not afford to lose raw material revenues, and developed countries such as Australia and Canada would be unlikely to resort to political embargoes. The possibility of oil-rich nations financing cartels to control commodity markets cannot be ignored. However, up until now OPEC members have largely limited their investments to assets which are both relatively liquid and provide a reasonably high yield.

While embargoes of raw materials do not appear likely, higher prices for these materials is a possibility. In many of the supplying countries included in our review--particularly in the developing countries--we noted host government actions aimed at achieving greater control over foreign investment in the extractive industries. (App. I of this report provides a closer look at the mining policies of supplying countries.) These actions include requirements of equity participation in mining projects, restrictions on imported capital, and stricter land use and environmental policies. Additionally, host governments are requiring revisions of existing contracts to increase revenues from mineral exports. Justifications for these actions include the needs to pay inflated prices for imports, finance development programs, or to adjust for changes in currency valuation.

Some of these producer actions may result in higher mineral prices; however, these countries recognize that there are limits to the level of increase they can expect to achieve. For example, the economic interdependence of developed and developing nations dictates the importance of maintaining stable trade relationships. Developing nations rely on the developed nations to provide them with raw material markets, foodstuffs, consumer goods, and industrial equipment.

Developing countries also recognize that, although multinational mining companies look to them for raw materials and the energy resources to process these materials, sufficiently diverse resource deposits exist to provide companies with investment choices. Thus, for a particular producer country to maximize its development potential, it must attract the investment of capital, marketing, technical, and management resources which only the mining companies in the industrialized countries can provide. The best way for producer countries to attract foreign investment is to provide some assurance to the investor that his investment will be secure.

We found that where conflict exists in extractive investments, the conflict is by nature a clash between host government and foreign investor interests. Unless such clashes curtail production, they have minimal implications for the delivery of mineral supplies to the United States or any other industrialized country, as basically they are efforts by both parties to further their economic well being.

For the five minerals reviewed, we found few investment conflicts. Most notable is the ongoing conflict between the aluminum companies and IBA members. In this instance the mining companies have been able to adapt to a changing operating environment. Companies have responded to host government demands for contract renegotiation and equity participation, and it would appear that the United States can continue to rely on its aluminum industry to meet the Nation's needs for aluminum. For the other four case study minerals, we identified no investment conflicts which resulted in a country withholding supplies from the United States.

Overall, it appears that market forces will assure a continued flow of minerals to the United States in the foreseeable future. Although individual producers or producer groups can be expected to seek higher prices, economic factors limit the degree of price increases that producers can expect to achieve.

Producing countries could impose price increases in the short term, and consumers would have no choice but to pay. However, in the long term, excessive price increases might spur industry efforts to find cheaper raw material sources, develop methods to reduce raw material requirements, or turn to substitutes. This would be contrary to producer desires for long-term maximization of revenues from raw material exports.

POLITICAL EMBARGOES

From an economic viewpoint, mineral embargoes are unlikely if producers wish to maximize revenues in the long term. Less developed countries, such as Jamaica, Malaysia, Surinam, and Gabon, are highly dependent on mineral sales to meet foreign exchange requirements and could not afford to lose export revenues or risk the possibility of counter-economic sanctions. Participation in an embargo by these less developed country producers would be inconsistent with their efforts to achieve internal economic development.

On the other hand, developed country producers, such as Australia, Canada, and South Africa, and near-developed

countries, such as Brazil, share defense, political, and economic relationships with the United States. Since these countries are major suppliers of the five minerals reviewed, it appears that the chances of a complete embargo, on political grounds, are not likely.

It also appears difficult for producers of four of the five minerals we studied to direct an embargo solely at the United States. For example, tin is sold on the open market, and producing countries and companies have little influence on the metal's final destination. Manganese, nickel, and bauxite production are largely controlled by vertically integrated companies with operations in the major consuming areas of Europe, Japan, and the United States. The international scope of these marketing operations would almost make it necessary to embargo all major consumer countries to effectively embargo the United States. Chromium is the exception, since the United States must rely on the state-controlled mining operations of the Soviet Union and Rhodesia for a large part of its supply. All Soviet ore and most Turkish and South African ore is sold through exclusive agents.

PRODUCER ORGANIZATIONS

The formation of producer groups in certain nonfuel minerals has led to U.S. concern that the orderly flow of minerals into the United States could be imperiled. However, the developed countries which would have to be members of a successful producer organization in any of the five minerals would probably serve as moderating forces in such organizations.

While countries such as Australia, Canada, and South Africa could be expected to support efforts for reasonable price increases and, conversely, to prevent drastic price declines, they would be unlikely to support efforts to withhold mineral supplies from other consuming nations as long as their reserves were adequate to meet domestic needs. For example, Canada's intention to limit oil and natural gas exportations will probably not be extended to nickel because Canada's nickel reserves are so vast.

Statements made by ITC and IBA suggest that they do not pose a serious threat to U.S. mineral supply in the foreseeable future. There are no commodity organizations for nickel and chromium. Manganese producers have met on an ad hoc basis under the auspices of the United Nations Conference on Trade and Development and are primarily concerned with preventing price declines and reducing consumer country trade barriers to importing processed manganese. Both developing and developed countries were represented in these discussions.

ITC is a long standing organization composed of both producers and consumers. ITC attempts to maintain sufficient price stability to encourage necessary mining investment to meet world demand. An official in the Malaysian Ministry of Primary Industries told us that, although producer countries have studied the possibility of restricting tin supplies to maintain high prices, they have concluded that tin is too susceptible to substitution and conservation to justify such action. Meanwhile, the producers are working to improve the effectiveness of ITC through such measures as enlarging the buffer stock to better achieve price stability and provide for a floating floor price.

The stated purpose of IBA, one of the newest commodity organizations, is to improve the bargaining position of the members vis-a-vis the aluminum companies and thus obtain a larger return for the members from bauxite mining. IBA motivation is economic rather than political. A Jamaican delegate to the formative meeting at Conakry, Guinea, in February 1974 noted that the countries share only economic, not political, interests. A further indication that IBA is unlikely to restrict supplies to consuming countries is the fact that Australia has insisted that IBA not act without unanimous consent of the members. Australian Government officials have also publicly stated that they do not wish IBA to emulate the OPEC example.

ECONOMIC NATIONALISM

Dissatisfied with their economic performance, developing countries have been increasingly demanding greater economic self-determination. A 1971 State Department study noted the increasing responsiveness of third world political leaders to the view that the developing countries

"* * * are excessively dependent on foreign companies which export resources, take a disproportionate share of profits out of the country and more generally exercise undue influence over governments and lives of people through their international economic power."

The same study noted:

"The increasingly positive and self-reliant attitudes taken by many developing countries toward their development problems, partly as a result of increasing technical competence, partly as a result of frustrations over trade and aid issues, and partly because they have an increasing range of choices in a world of expanding capital centers and institutions."

These concepts have continued to gather momentum, as evidenced by debates in the Sixth Special Session of the U.N. General Assembly on raw materials in 1974 and in the Dakar Conference on commodities held in February 1975. In these discussions the developing countries argued that their economic emancipation was possible only through the recovery and control of their material resources and demanded a profound reorganization of international economic relations between developed and less developed nations.

Emphasized in the Dakar Conference was the vulnerability of the economies of developing countries under current international export and import trade mechanisms and the belief that efforts toward liberalizing international trade have not recognized trade barriers between developed and developing countries in raw and semiprocessed commodities. Developing countries look at past international market constraints as having been ineffective and as having resulted in a long-term deterioration in their terms of trade; that is, they receive less for their exports and have to pay more for the products of developed nations. They believe that world commodity markets traditionally experience chronic instability through shifts in the balance of world supply and demand as well as through speculation in the markets encouraged by a lack of regulations. They point out that there are no price supports in the world markets for commodities, in contrast to systems operating in domestic markets of many developed countries.

Participants of the Dakar Conference declared that the sudden increases in commodity prices in 1973 and 1974 were due to exceptional circumstances and increases in demand rather than to any conscious international policy.

Many developing countries are also concerned about multinational corporation control of production and trade in many commodity markets. Countries with mining industries are especially concerned, since minerals are nonrenewable resources and because many developing economies are particularly dependent on mineral exports. Dissatisfied with their returns on mineral exports and with the contribution of the mineral industries to national development, host governments increasingly exercise greater control over foreign investment. This control is most often in the form of limitations on the size of foreign investment in resource projects and government control of mining lands. Governments have increasingly considered intervening in mining operations to influence production schedules, processing-plant investment, and contract terms.

Foreign mining companies operating in developing countries view host government complaints in quite a different light. These companies feel that developing countries have taken too much for granted the technology, capital investment, and markets that allowed these countries to develop resources that had been untapped for centuries. After all, they argue, it was the mineral industries of the industrialized world which

- found a use and market for these materials;
- developed technology for the extraction of these minerals;
- made the capital available to provide the machinery, roads, and infrastructure needed for the exploitation of these minerals;
- provided the skilled manpower to take care of all the aspects involved in mining, processing, and marketing; and
- provided local citizens job opportunities and, in many cases, a better life than they could have otherwise expected.

The divergence of viewpoints between the developing countries and the multinational mining firms points to the source of the conflict.

Economic nationalism has also spread to the developed countries of Australia and Canada. Favored by investors because of their receptiveness to foreign investment, the two countries now share many of the same concerns of developing producer countries. These two countries have moved to impose restrictions on foreign extractive investment to maintain greater national control over their natural resources. Concerned over low returns from mineral exports, both countries have expressed a willingness to cooperate with developing producers to prevent price declines in raw material markets. They also share the developing nations' desire to derive the added value of processed-material exports to increase their revenues. For example, Australia receives about \$4 per ton for bauxite compared to about \$39 per ton for alumina.

The OPEC factor

There is the possibility that OPEC countries could use their new-found wealth to finance cartelization efforts by the nonfuel mineral and other raw material producers. For example, some OPEC countries could finance commodity buffer stocks,

provide economic support for producers which might experience balance of payments problems, and aid in negotiating producer country demands with multinational corporations.

OPEC countries have been less than enthusiastic about such investments. With the exception of Algeria, OPEC representatives have generally shown a low profile in both the United Nations and the Dakar Conference concerning such investments.

The international economic leverage which the oil producers possess and its potential influence on other commodity markets must be kept in mind. The April 1975 preparatory energy conference in Paris, attended by oil-producing states and developed and underdeveloped consuming countries, reached an impasse on whether a proposed conference should be confined essentially to the energy crisis or whether it should be expanded to all raw materials and their role in the economic relations between the developed and undeveloped world.

Future OPEC financial influence on the nonfuel mineral markets appears doubtful. Billions of dollars would be required to effectively control international nonfuel mineral markets, and the expected return on such an investment would not be predictable. OPEC countries have generally targeted their investment money toward secure projects in developed countries, rather than the developing countries where political and economic conditions are often less stable.

Discussions have been held between certain oil-producing countries and members of the Intergovernmental Council of Copper Exporting Countries over the possibility of Arab financing of a copper stockpile. However, according to a July 1975 Metals Week report, the talks broke down because the oil producers wanted a guarantee that would limit their losses if copper prices continued a downward trend.

There is also the question of how developing countries would react to any intervention or control over their internal affairs. Developing countries which now resist foreign investment may very well resist any large-scale OPEC efforts to encroach on their sovereignty. However, developing countries also recognize that the dramatic oil price increases have increased the prices they must pay for imports and may seek financial support from OPEC to offset these increases.

Possible changes in attitudes of governments

The strong demand for minerals plus inadequate capacity in the metal-processing industry have strengthened the bargaining position of producer nations. However, mineral demand

is historically cyclical and the high level of demand during 1973-74 abated with the recession which followed in the United States and other industrial countries. Fluctuations in mineral demand and the resulting economic impact on producer nations may cause them to reexamine governmental policies toward foreign mining investments.

For instance both Brazil and Australia, having had severe problems with inflation, required that substantial portions of invested foreign capital be placed in noninterest-bearing accounts to slow capital inflows. This tactic succeeded in delaying company investment plans. However, in 1974, as a result of their dependence on high-cost petroleum imports, both countries virtually eliminated the deposit requirement to spur capital inflows and thus alleviate serious balance-of-payments problems.

Between August 1971 and September 1973, Australia revalued its dollar by 33 percent compared to the U.S. dollar. Since mineral contracts were written in U.S. dollars, Australian mining companies suffered a significant disadvantage and under Australian Government pressure, renegotiated existing contracts with buyers.

Jamaica, which passed its new bauxite tax levy in June 1974, appears willing to compromise on the levy each company must pay to gain increased equity participation in the aluminum companies operating in Jamaica. For example, in November 1974 Jamaica reduced the bauxite taxes Kaiser Aluminum and Chemical Corporation must pay for the next 5 years in return for the option to buy back Kaiser's bauxite lands and purchase a majority interest in Kaiser's Jamaican subsidiary. Alcan and Reynolds are also negotiating land buybacks with Jamaica. There are more recent signs of cooperation, including the relaxation of the minimum production level requirement as an outgrowth of depressed demand.

Since mining firms do not have unlimited capital, and since world mineral reserves are large and diverse, expansion cannot take place in all countries. The companies decide where their capital investments will be made; therefore, expansion in one country could be at the expense of other producer countries, some of which have huge reserves waiting to be tapped. In periods of slack demand, production cutbacks may affect one country more than another. Despite increasing producer leverage, most notably in bauxite, there are numerous variables which in the future may also strengthen the bargaining position of the mining companies.

CORPORATE ADAPTABILITY

For the five minerals we reviewed, one of the major issues raised by the producing nations has been the question of inordinate foreign influence on their national economies by multinational corporations. Producing nations have been particularly sensitive about foreign control of their natural resources. Thus far U.S. mining corporations have adapted to changing attitudes and requirements of host governments and have resolved conflicts in a way which has assured uninterrupted supplies to the U.S. market.

As a means of minimizing the political risks to their investments, U.S. companies have modified their investment methods. The long-standing corporate requirement that a company have total control over mining operations is in decline. U.S. companies are finding it possible and profitable to operate with the host country holding the majority interest. A U.S. businessman in Brazil told us his company was glad to have majority Brazilian participation because it minimized the political risks and provided needed financing. In the nine countries we visited, public or private participation requirements did not appear to cause serious operational problems to the mining firms. We did find that a lack of local capital in some countries, including Australia, had contributed to postponement of some projects.

U.S. companies are also entering into joint ventures with European and Japanese companies to minimize business and political risks. Participation in a consortium minimizes the capital requirements for a company and also reduces the share of production which each company must market. Politically, participation of several foreign companies in a consortium means that, in any serious investment dispute which might arise with the host government, the interests of more than one foreign country would be involved.

A second issue between host governments and mining companies concerns investment in processing facilities. Seeking maximum revenues to finance economic development, host governments cajole or pressure companies to process ore before export. One tactic is to make access to mineral deposits contingent on contractual agreement to invest in processing facilities at a future date. Because the investment in processing facilities is substantially larger than that required for mining operations, international mining companies have been reluctant to make such investments in developing countries which the companies consider unstable.

Despite political risk, economic considerations are resulting in increased investment in mineral-processing

facilities in some host countries. Exporting processed minerals can save transportation, labor, and energy costs. Some host governments provide various financial incentives to encourage mineral-processing investment. The less stringent environmental standards in developing countries, as compared to industrialized countries, also serve as incentives to locate processing facilities overseas.

Some U.S. companies have taken the lead in the trend to overseas processing, and Japan, which has traditionally imported only low cost raw ores, has begun to pursue investment possibilities in foreign processing facilities in part because of increased pressure by Indonesia and Turkey.

Another major issue concerns producer country complaints over long-term contracts with mining companies, which result in mineral prices which lag behind the general inflation trend. Some developing countries in particular are highly dependent on their mineral exports to finance development programs or to purchase increasingly costly food and capital goods imports. Long-term contracts which do not account for inflationary trends have severely affected these countries.

Changes in mining contracts should alleviate these problems. An Australian Department of Minerals and Energy official said Australia will require that all mining contracts be term contracts providing for renegotiation of prices every 1 to 3 years, with escalation clauses during intervening periods. Haiti's contracts with a U.S. aluminum company provide for renegotiation every 4 years. Bauxite countries are expected to follow the Jamaican lead by tying bauxite revenues to fluctuations in aluminum prices. The same proposal has been made for manganese, a mineral facing the prospect of oversupply.

U.S. aluminum companies have recognized the financial problems facing developing countries, notably in the Caribbean, and have agreed to renegotiate existing contracts. As evidenced by the Jamaican action, wherein the host government can break existing contracts at will, the companies have little choice but to renegotiate. An aluminum company official in Australia told us that in future investments U.S. companies likely will be required to provide for contract renegotiation, because Japanese firms have shown a willingness to bear the higher costs in order to assure access to supplies.

WORLDWIDE INTERDEPENDENCE

Despite the fact that producer countries are increasingly alert to opportunities to maximize their mineral export revenues in the short term, there appears that there is an

effective, yet admittedly undefined, limit to the extent which producers can push for higher mineral prices in the long term. Some of the factors setting this limit have been mentioned, including industrial technology permitting material substitution and recycling and, in the case of the five minerals reviewed, their relative worldwide physical abundance.

But transcending these factors is the economic reality that nations are becoming increasingly interdependent. Developing nations realize that the industrial world will depend increasingly on their largely untapped resources. However, dependence on these countries is neither complete nor uniform, as large quantities of nonfuel minerals are located in developed countries.

If developing producer countries are to achieve full development potential, they must utilize the capital, technological, and marketing assets of the multinational corporations. The developing countries also depend upon trade with developed countries which not only consume their resources but also provide the capital and consumer goods, not to mention foodstuffs, which the developing countries generally must import.

However, many developing producer countries believe that unfair trade barriers exist in the world market. For example, at the April 1974 United Nations Conference on Trade and Development, developing countries which produce manganese ore pointed out that many consuming countries have tariffs on the imports of processed minerals. These restrictions effectively limit the development of processing capacity in producer countries and prevent them from sharing the greater revenues associated with exporting processed materials. Lifting these trade barriers, however, will not equally benefit all developing countries. The development of local processing capabilities will also depend on the availability of capital, energy, a trained labor force, and markets.

The consuming countries participating in these discussions recognized these issues, but felt that they must be handled in international trade forums such as the General Agreement on Tariffs and Trade. In May 1974 the U.N. General Assembly adopted a "Programme of Action on the Establishment of a New International Economic Order" which called for reforms in general trade areas, including improved access to markets in developed countries through the progressive removal of tariff and nontariff barriers and restrictive barrier practices.

The interdependence among mineral-consuming countries means that events affecting mineral supply to one industrialized nation will affect other consuming nations. In

addition, unilateral efforts by one consumer to secure minerals to the exclusion of other consumers would affect the supply of other consuming countries, particularly in the short term. Consequently, solutions to many raw material supply problems may rest with increased cooperation among consuming nations.

THE MARKET MECHANISM

In the long term, economic rather than political factors can be expected to determine mineral prices. However, mineral markets will continue to be subject to short-term producer price gouging, not only from actions of producer countries but also from private enterprise as well, particularly in high demand periods because of consumers' inability to reduce their demand in the short term.

Prolonged price increases in nonfuel mineral markets are not likely to be sustained even if producers try to maintain prices through production restrictions or other means, such as buffer stocks. For example, although four members of the Intergovernmental Council of Copper Exporting Countries announced plans to reduce copper shipments by 10 percent in November 1974, copper prices continued to decline.

From the beginning of the First International Tin Agreement in July 1956--and even more so, from the point of time in 1957 when the International Tin Council's buffer stock manager began to buy tin to support its price--the tin market was subject to a degree of influence which sometimes resulted in control. For roughly one-half of the 15 years between 1956 and 1971 the ITC sought to influence price variations by limiting the tonnage of tin entering the market or by acting through the buffer stock or by both. For less than another one-third of the period the price and its variations were determined by actual or anticipated disposals from the U.S. surplus strategic stockpile, and for less than one-third of the period neither the ITC nor the stockpile could claim effective control over the price.

The long term ability of many commodity markets to maintain high prices often depends on the degree of supply and demand elasticity in the market. For example, OPEC representatives have stated that they believe their market leverage will enable them to maintain high oil prices in the future despite efforts of consuming countries to reduce demand. It is believed that consuming countries can reduce their consumption 10 percent at the most; correspondingly, the producing countries can restrict the available world oil supply 30 percent.

Such producer country leverage in the nonfuel mineral markets does not appear economically feasible. Mining firms have traditionally recognized the long-term pricing problems associated with these markets. Generally, to the extent possible, these firms have attempted to establish prices that would enable long-term profit maximization and at the same time avoid consumer substitution and additional mineral production. Severe short-term monopolistic price increases have generally been avoided because of the possibility of increasing competition and reducing prices.

LIMITS TO PRODUCER LEVERAGE

As already noted in chapters 2 and 4, the size of the price increases which can be achieved by nonfuel mineral producers in the long term is limited by the potential for material substitution, exploitation of alternative raw material resources, and recycling. The June 1974 action by Jamaica, raising bauxite taxes by \$167 million or 700 percent, is an example of producer leverage in the short term. The tax increase added 2 to 3 cents per pound to the price of aluminum ingot during 1974--a relatively small increase compared to the total price increase in the same period of about 10 cents per pound due to this and other factors, including increased transportation and energy costs. Jamaica's ability to further raise taxes is hampered by the potential for aluminum companies to explore non-Caribbean sources and the potential of domestic aluminum resources. Other fiscal, economic, and political impediments exist which will moderate the price increases producers can achieve.

A goal of many developing countries is greater national control of their resource industries. Methods to achieve such control include expropriation; equity participation; or foreign loans, from such sources as the World Bank or the oil-rich countries, to finance national ventures. These three methods share common elements in that they normally impose debt obligations on the host government which must be repaid if the country is to retain its credit rating. An attempt by a host government to restrict production might impede its ability to meet debt service obligations and thereby jeopardize its credit rating.

Mining and processing projects generally require large capital investment and thus represent considerable business risks. Before financing such projects potential creditors must usually be convinced of the project's economic viability. One of the best means of assuring the financing success of a project is through long-term purchase contracts with consumers. Mineral users are not likely to commit themselves to such contracts unless producers demonstrate that

they can be relied upon to meet their contract commitments. Producer-induced supply uncertainties could lead consumers to seek alternative resource deposits, or technological improvements aimed at reducing material requirements.

Another goal of developing countries is to achieve diversification for their economies, with minimal dependence on commodity export cycles. In other words, developing countries seek industrial development to help them vertically integrate their mining industries. The requisite foreign investment may only be forthcoming for investments offering attractive returns and with some guarantee of political/economic stability.

Producer dependence on foreign investment to reach development goals is recognized by the governments of Guinea, Gabon, the Dominican Republic, and Brazil, to mention a few. Malaysia and Indonesia, like other developing countries, encourage domestic investment in resources industries to the maximum possible extent but realize the need for foreign investment in large-scale projects. The lack of local capital to finance development is also evident in Australia, where some investment projects have floundered.

OPEC members are a potential source of funds for industrial investments in producer countries. However, as previously noted, OPEC members have largely limited investments to assets that are relatively liquid and high yield.

Differing political/economic systems of producers will impose limitations on the ability of producer groups to exert leverage in resource markets. Although the Australian Government can impose controls on mineral exports, U.S. Embassy personnel and Australian business officials feel such controls would be directed at maintaining rather than raising price levels. South Africa's interest in attracting additional foreign investment might cause it to resist unreasonable price increase initiatives by Gabon in manganese or the Soviet Union in chromium. Canada has rejected the idea of government-to-government supply contracts as unworkable in its capitalistic economy.

Another long-term factor which argues against the success of producers restricting supplies to raise mineral prices is the abundant world reserves of the minerals we studied. Producers are competing with one another; if one or more cuts back on production, other producers can expand production and increase revenues. Even among producers agreeing to restrict the supplies, the temptation exists for individual producers to sell outside the agreement to increase revenues. Attempts to restrict bauxite production

must come with the recognition that IBA members, as well as non-IBA countries such as Brazil, can expand production. South Africa and Australia can expand manganese production at the expense of Gabon or Brazil, and South Africa can expand chromite and ferrochromium production at the expense of the Soviet Union and Rhodesia.

The ability of producers to maintain price control over a commodity is also heavily dependent on the competitiveness of the market and the degree of vertical integration within the industry. In this regard an August 1974 special report of the Office of Media Services, Department of State,¹ noted that:

"Where markets are reasonably competitive and the producing firms are not vertically integrated, producers' associations may not be able to influence prices by raising taxes on the private producing firms. If taxes are raised and not passed on to the consumers, the profits of the private companies will decline and they may not be able or willing to expand productive capacity or even to replace obsolescent or worn-out equipment and structures.

"If the producers' association seeks to maintain an agreed-upon price by requiring that all contracts be negotiated at or above that price, those members whose production is in the hands of private international firms with superior marketing organizations or with downstream affiliates are likely to achieve a larger market share than members with nationalized industries and relatively poor marketing organizations. Purchasers may also prefer to negotiate contracts with international firms with several sources of supply rather than contracts with nationalized enterprises. Under these circumstances some members may soon accumulate surpluses or be forced to violate the price agreement by shading contract prices."

The aluminum industry is the only fully integrated industry for the five case study minerals. Its structure allows

¹
This study was prepared by a special consultant, Professor Raymond F. Mikesell of the University of Oregon. The Department of State notes that publication of the study does not constitute endorsement by the Department, nor should the contents be construed as reflecting the official position of the Department.

bauxite producers to increase taxes and royalties, while marketing responsibility remains with the companies. The bauxite producers expect that these taxes will be passed on to the consumer.

The structure of the other four industries varies from subsidiaries of multinational corporations to locally owned operations. The manganese industry is traditionally highly competitive, with less than one-third of its membership controlled by vertically integrated steel companies. The nickel industry is dominated by two Canadian companies which control large reserves. The tin industry is controlled by ITC, whose members sell tin through commodity markets. The chromium industry in South Africa is locally owned and competitive with the government-controlled industries in Rhodesia and the Soviet Union.

Finally, long-term price fixing for one mineral can generally be successful only if producers of substitute minerals support the price through price increases of their own. In this regard there have been reports of coordination--between producer organizations in oil, bauxite, tin, copper, and iron ore--which raise the specter of concerted action against consuming countries. The February 1975 Dakar conference on commodities lent credence to these reports, as developing country producers called for ultimate coordination in all commodities.

Producer agreement on goals for a commodity organization does not necessarily guarantee the unity of the organization. The perceived self-interests of the countries involved offer the potential for conflict among organization members. For example, individual producers can only expand production at the expense of other producers. Conflict can also result between commodity organizations, as tin, aluminum, and copper are basic competitors in metals markets. Difficulties in maintaining producer unity would be acute in periods of declining mineral demand.

CONCLUSIONS

For the five case study minerals, there exists an interdependency between the United States and producing countries that appears to be irreversible. It is clear that the United States and producing countries have much to gain by resolving raw material disputes. To help stabilize the environment of the international mineral markets, the Secretary of State should continue the dialogue between producing and consuming nations considering both the economic aspirations of producer countries as well as the desire of consuming countries to minimize raw material costs.

Multinational corporation influence in the mineral markets we studied is in decline. Solutions to developing country problems, which include dissatisfaction with consuming country trade barriers, balance of payments, and inflation, are beyond multinational corporation control.

Producing governments, particularly those in bauxite, are gaining control over their natural resources by equity participation, control over land ownership, nationalization, and through producer organizations but are not immune from the market system. There appear to be some limits to producers' leverage to increase prices, and producer countries will continue to require the capital, technology, and markets to develop their natural resources.

In both developing and developed countries, capital expansion has declined. Although the current recession has reduced past pressures on plant capacity and mineral prices, economic recovery will mean a return to tight supply and higher prices. Developing countries are demanding that they receive a greater share of the processing capacity. However, it is doubtful that expansion of mining processing capacity will take place in these countries unless there is an assurance of investment security and mineral flow.

With regard to political embargoes, we found no apparent political issues which would cause producing countries to accept the economic consequences resulting from an embargo. Our analysis by country shows that the most likely possibility of a supply disruption is in chromium.

RECOMMENDATIONS

We recommend that the Secretary of State:

- Favor, through existing development assistance and financing programs, efforts to support diversification of less-developed-country economies.
- Consider selectively lifting trade barriers against imported processed minerals from developing countries willing to conclude mutually acceptable mineral access agreements. However, in this case it will first be necessary to evaluate and quantify the impact of this course of action on U.S. employment, the need for Government retraining of U.S. employees affected by trade concessions, and balance-of-payment considerations.
- Work with other consuming countries through existing

forums to develop a common response to the actions of producing countries and cartels.

AGENCY COMMENTS

The Department of State favors a dialogue between producing and consuming countries and a variety of financing programs to support the diversification of less-developed-country economies. It also agrees that lowering trade barriers to processed materials remains a major action which the United States could take in return for acceptable understandings on access to resources. Finally, the Department noted that it was working with other consuming countries to develop common responses to actions of producing countries. (See p. 100.)

We believe that the recent actions taken by the Department of State will assist in diffusing the explosive issues which have an impact on the security of U.S. supply. The recent proposals by the Department at the Seventh Special Session of the United Nations General Assembly¹ indicate that both the United States and the third world agree that the chronic instability in commodity markets has been particularly harmful to the world's poorest nations.

¹On September 1, 1975, at the Seventh Special Session of the General Assembly, the United States proposed creation within the International Monetary Fund of a new development security facility to stabilize overall export earnings. The facility would give loans to sustain development programs in the face of export fluctuations of up to \$2.5 billion, and possibly more, in a single year with a potential total of \$10 billion in outstanding loans.

CHAPTER 6

U.S. GOVERNMENT PROGRAMS AND THEIR ROLE

IN INTERNATIONAL MINERAL SUPPLY

While the Government has sometimes offered incentives to the private sector to stimulate production, only in times of war and during the depression has it intervened to the extent of controlling production and distribution of critical materials. However, certain Government programs have affected the mineral industry and may have influenced the volume and direction of international mineral development. These programs include

- provision of political risk insurance on U.S. investments abroad by OPIC,
- extension of loans by the Export-Import Bank of the United States (Eximbank) to borrowers outside the United States for the purchase of U.S. goods and services, and
- encouragement of foreign investment through certain U.S. tax incentives.

POLITICAL RISK INSURANCE: INCENTIVE FOR EXPANSION

The Overseas Private Investment Corporation encourages U.S. firms to invest in less developed countries by offering political risk insurance on their investments. OPIC insurance makes investment in less developed countries more competitive with alternative investments in developed countries where political and economic risks are more predictable. Many other industrialized nations, including Sweden, Japan, Germany, the United Kingdom, and France, assist foreign investment through similar programs.

Evidence indicating the importance of OPIC insurance to U.S. mining firms is inconclusive. Some investors, despite being denied OPIC insurance, have gone forward with their investments while others have not. An OPIC-sponsored survey of its insured investors in 1971 indicated that future investment decisions may hinge on their ability to obtain insurance. Sixty-nine percent of the investors in the extractive industries responding to the survey viewed OPIC insurance as mandatory for their future investments in developing countries.

Contribution to mining expansion

As of April 1974, OPIC held 58 active insurance contracts for investments in our case study minerals. These investments, totaling over \$1 billion and located in 17 countries, enabled U.S. mining firms to expand their production capabilities and to open up new foreign supply sources. Some of the more significant OPIC-insured mining and processing projects and their contribution to the world's mineral supply are summarized below. A complete list of OPIC-insured projects in the minerals we reviewed is shown in appendix II.

Contribution of Selected OPIC-Insured Projects to the World's Mineral Supply

<u>Project</u>	<u>Country</u>	<u>Contribution</u>
Tin mining	Thailand	Expected to initially increase Thailand's production more than 10 percent
Tin smelter	Thailand	Allowed Thailand to smelt its own tin previously smelted in Malaysia; Thailand is now the second largest supplier of tin to the United States--almost 15 percent in 1974
Tin mining	Brazil	Development of reserves expected to enable Brazil to become tin exporter
Aluminum plant	Ghana	Increased Ghana's production, enabling it to supply 7 percent of U.S. aluminum imports in 1973
Alumina/aluminum plant	Brazil	Developed processing capacity needed for extensive untapped bauxite reserves
Bauxite mining	Guinea	Developed second largest bauxite reserves in the world
Nickel mining	Botswana	Encouraged U.S. competition in Canadian-dominated world nickel market
Nickel mining	Dominican Republic	Became new U.S. supplier--7 percent of 1973 imports

Limits to OPIC effectiveness

OPIC emphasizes that private investment in developing countries not only benefits the host country but the United States as well, in terms of economic returns, U.S. tax revenues, export growth, creation of jobs, access to sources of strategic supplies, and maintaining competitiveness in an expanding world economy. The OPIC program, with certain modifications, could serve to emphasize these benefits to the United States and provide the Government opportunities to diversify foreign sources of minerals.

OPIC's authorizing legislation, the Foreign Assistance Act of 1961, as amended (22 U.S.C. 2191), contains certain restrictions which limit OPIC's involvement in international mineral development. These provisions

- prohibit OPIC from directly financing mineral extraction projects and mineral surveys (22 U.S.C. 2194),
- prohibit assistance to firms which are not "substantially beneficially owned by United States citizens" (22 U.S.C. 2198), and
- require that OPIC operate only in less developed friendly countries (22 U.S.C. 2197).

Several investments in mineral projects which were expected to provide important benefits to the United States, including possible new supply sources, were rejected for OPIC assistance because of these restrictions. For example, in 1971 OPIC rejected an insurance application for expanding a nickel-mining operation in New Caledonia partly because it failed to meet OPIC's criteria for designation as a less developed country. The applicant contended that the project could offer the United States

- control of a significant amount of this highly sought-after strategic commodity,
- a share in the development of one of the largest remaining nickel deposits in the free world, and
- a chance to obtain a supply of nickel on a long-term basis.

In addition, the terms of the contract would have guaranteed OPIC the rights to purchase a certain amount of the facility's production at an agreed upon price-above-costs in case of expropriation. OPIC viewed this provision as a desirable "new approach to natural resource projects which may set a useful pattern in this very important area." Despite these benefits OPIC had to reject the project as ineligible.

In at least two cases, the eligibility requirement that the applicant firm be "substantially beneficially owned by United States citizens" was a consideration in their rejection for OPIC assistance. A bauxite-mining project in Brazil, proposed in 1972, offered opportunities to

--diversify the U.S. bauxite supply and

--secure a type of bauxite unobtainable from two other prospective bauxite exporters (Australia and Guinea).

OPIC's Investment Committee determined, however, that these benefits did not warrant OPIC assistance, especially since the firm's U.S. ownership had dropped to less than 40 percent.

Several months later, OPIC, following previous interpretations by the Agency for International Development that a corporation "substantially beneficially owned by United States citizens" means "more than 50 percent U.S. owned," denied insurance to the investor of a second mining project. Furthermore, because the firm's ownership was divided among several countries--49 percent United States, 28 percent Canadian, and 13 percent other nations--and because Canada's insurance agency had requirements similar to OPIC's, the firm was ineligible for insurance in both the United States and Canada.

It should be noted that the Foreign Assistance Act of 1961, as amended, permits OPIC to insure the U.S. portion of a joint venture between a U.S. firm and foreign companies. However, OPIC may not insure a company which has a minority U.S. stockholder interest.

OPIC officials have cited the legislative restrictions against direct OPIC financing of mining projects and mineral surveys as important limitations on the versatility and usefulness of OPIC's finance program. In April 1973 OPIC's President, testifying before the Subcommittee on Foreign Operations, House Committee on Appropriations, pointed out that several nations had encouraged their private sector "to seek out and develop foreign sources of needed raw materials" through investment insurance; preinvestment assistance; and long-term, low-interest loans. In effect OPIC was specifically requesting guidance on what its role should be in securing essential raw materials.

The Office of Management and Budget has pointed out that congressional mandates have tended to limit OPIC assistance to large natural resource projects. In this regard Congress has made it clear that it wants OPIC to

- continue its original mandate of assisting the development of less developed countries,
- avoid politically sensitive investments, and
- follow principles of risk management with the aim of "privatizing" the insurance program by 1980.

These mandates led OPIC to adopt a special set of guidelines in 1971 for insuring "large and sensitive" industries. These criteria, which apply to large natural resource projects,

- limit insurance coverage in amount and duration,
- provide for variable rates according to the degree of risk involved, and
- provide for declining coverage on the investment.

OPIC has also set criteria to limit insurance coverage in any one country or industry.

A September 1973 Congressional Research Service analysis of OPIC, prepared for the House Committee on Foreign Affairs, concluded that the "large and sensitive" criteria may be partly responsible for the decline in new large mining projects insured by OPIC. As of April 1974 OPIC had insured only 6 of the 58 active insurance contracts it held on projects involving the case study minerals. The rest were issued by OPIC's predecessor, the Agency for International Development, before January 1971. An OPIC official felt that this decline has been due mostly to the reluctance of investors to expand their operations because of uncertain investment climates in the developing countries.

EXPORT PROMOTION: INDIRECT VEHICLE TOWARD DIVERSIFICATION

The primary purpose of Eximbank is to promote the expansion of exports of U.S. products and services through various financial services. Through these services Eximbank has increased world mineral production and diversified sources. Eximbank programs are open to foreign buyers, including subsidiaries of U.S. firms incorporated in a foreign country. Its operations are not limited to less developed countries.

Unlike the official export credit agencies of other major industrial countries, Eximbank has been providing direct loans at discount rates on only a portion of the value of the exports--usually 45 percent or less. The remainder has been loaned through commercial banks at prevailing interest rates. By contrast, competing export agencies provide financing at about one-half the prevailing market rates of interest. The result has been that the agencies of England, France, Japan, and Germany covered in total eight times as much in shipments as were covered by Eximbank in 1973. In February 1975 Eximbank announced new financing terms which should enable it to better compete with other export agencies.

As of June 1975 Eximbank had outstanding loans and financial guarantees, amounting to about \$600 million, on exports of bauxite/aluminum, nickel, and manganese projects in 14 countries. Of these projects, about half involve either the development of new mineral deposits or expansion of existing production facilities. The other half involve construction of new processing facilities to meet increasing demand for processed materials. Appendix III lists these Eximbank-supported projects.

In reviewing mineral projects supported by Eximbank, we noted that some were directed at supplying local markets and countries other than the United States. For example, one loan application for an aluminum-rolling mill in the United Kingdom stated that the new facility would enable the firm to better compete with European competitors in supplying the European market. Other loans to Mexican and Indian aluminum plants were needed so that the respective firms could accommodate their expanding local markets. In still another case, information provided before Eximbank extended its assistance showed that the expanded production of a nickel mine in Australia was tied to long-term sales contracts with purchasers in Germany, Britain, Japan, and other countries, but not the United States.

For other projects there was some advance assurance that a portion of the increased production would find its way back to the United States. For example, one Eximbank-assisted bauxite project owned by the government of Guyana had traditionally sold about half its production to U.S. purchasers. In Guinea an advance sales contract with one U.S. aluminum firm insured its purchase of 1.4 million metric tons of the total 5.1 million metric tons of bauxite expected over the first 5 years of the project. The applicants for an Eximbank loan associated with the development of a Mexican manganese mine stressed the value to the United States of a substantial nearby source of manganese.

We realize that assisting mineral firms of other countries to supply their local markets frees other sources to supply the United States. However, we believe that Eximbank should give preference to those projects providing some assurance of increased mineral imports to the United States over those which do not. An Eximbank representative told us that traditionally the main criteria for approval has been the applicant's ability to repay the loan and that the destination of the operation's output was secondary. She stated that the energy crisis and the recent focus on shortages in this country have caused Eximbank to examine more closely the effects its support might have on shortages. As a result, Eximbank plans to consider more favorably those projects stimulating an exchange of trade beneficial to the United States. Eximbank's increasing applications volume should enable it to be fairly selective of the projects it supports.

IMPACT OF U.S. TAX LAW ON
FOREIGN MINERAL INVESTMENT
NOT DEVELOPED

The extent that the Government has affected foreign mining exploration and development through tax law has not been clearly identified. Often mining ventures are carried out by multinational corporations engaged in many activities, including mining. The U.S. tax code treatment of foreign source income is a complicated issue and isolation of its effect on one industry is extremely difficult. In view of these facts, the following is a brief discussion of some of the major provisions of U.S. taxation of foreign source income as related to the mining industry and percentage depletion, which provides for a lower effective tax rate for the mining industry.

Certain U.S. tax provisions allow foreign income taxes to be credited against U.S. income tax. Taxation of profits of foreign subsidiaries is deferred until foreign profits are remitted, usually in the form of dividends. The larger share of foreign direct investment is made through subsidiary corporations, because of the advantage of deferral of U.S. tax. Other provisions offer tax reductions for investment in foreign countries through exemptions or lower tax rates under certain circumstances. For example, the United States Code provides a reduced corporate tax rate for corporations qualifying under the Western Hemisphere Trade Corporation provisions. Qualifying corporations are granted deductions of approximately 29 percent of taxable income.

U.S. tax provisions relating to taxation of foreign income allow different tax accounting techniques for foreign branches--as opposed to foreign subsidiaries--of U.S. corporations. For example, tax deferral is not generally allowed for profits of foreign branches of a U.S. corporation. Investments made through foreign branches are treated as domestic investments, and foreign branch profits are subject to U.S. tax. In addition, during the first years of a venture when large operating losses normally occur, U.S. companies may reduce their U.S. income tax by operating through a foreign branch (foreign branches may offset foreign losses against domestic income) rather than through a foreign subsidiary. According to Treasury officials, branch operations are used predominantly in mining for the initial loss years because of this provision and the fact that operating through a branch also allows mining companies to take such deductions as depletion allowances and exploration costs. Percentage depletion is only allowed for foreign branch operations or, in some cases, partnership arrangements.

A Treasury official said that the required equity participation in host countries does not eliminate operation through a foreign branch. If equity participation is required, percentage depletion can be claimed on that portion of the equity owned. It was pointed out that, if the host country requires in-country incorporation, branch operation for U.S. tax purposes is not allowed.

The mineral depletion allowance, allowed for both domestic and foreign mining operations, is intended to encourage mineral exploration and development. Although depletion may take either of two forms (cost or percentage) for tax purposes, percentage depletion is most commonly used in the mining industry. Percentage depletion allows U.S. companies to deduct a percentage of gross income before taxes with the percentage rate varying, depending on the mineral and whether a domestic or foreign venture is involved. The deduction may not, however, exceed 50 percent of the taxable income remaining after all deductions except depletion.

We were not able to develop reliable data on the significance of the above provisions to the mineral industries reviewed or to the mineral industry in general. Department of the Treasury officials told us that no studies had been

conducted within Treasury to determine the significance to the mining industry of the treatment of foreign income or depletion provisions. It is their opinion, however, that the current United States Code is basically neutral overall, in that it neither encourages nor discourages foreign versus domestic mining investment of U.S. corporations.

A March 1973 private study--commissioned by the American Mining Congress--attempted to analyze the tax structure of eight other leading capital exporting countries and to measure the burden of the U.S. tax structure relative to those countries.

The minerals selected for study were copper, iron, nickel, and manganese, and the exporting countries included were Canada, Germany, the United Kingdom, France, Japan, Belgium, the Netherlands, and Switzerland.

For nickel and manganese--two of the minerals included in our review--the study concluded that the average tax position of a U.S. mining investor compared to investors from the eight other capital exporting countries in regard to return on equity and return on investment was as follows:

	Total <u>countries surveyed</u>	Comparative rank of the <u>United States</u> <u>Nickel Manganese</u>	
Return on equity	9	6	5
Return on investment	9	4	5

Authors of the study cautioned that it was based on a model approach and did not represent actual mining operations and that findings were not necessarily indicative of what a particular mining company would or would not invest in.

During the 93d Congress the executive branch proposed changes in various provisions of the tax laws dealing with the treatment of foreign income. One major change recommended was to recapture foreign losses.

Consideration of foreign losses has been aimed primarily at the practice of beginning a foreign operation as a branch to deduct large startup losses from domestic income and then to incorporate the operation once it becomes profitable. The objective would be to require that foreign losses offsetting U.S. income be recaptured in future years when foreign

income is earned. According to some mining industry observers, this would directly affect some mining investment decisions, in that many mining operations begin initially as branches to take advantage of depletion and other provisions. However, it was also noted that tax costs are only one of several factors in an investment decision and that, generally, tax factors are not the deciding element. On the other hand, tax changes designed to reduce corporate revenues could result in higher commodity prices as corporations pass on increased costs.

Consideration has also been given to the repeal of foreign percentage depletion for nonfuel minerals. For example, the House Committee on Ways and Means in May 1974 had tentatively agreed to repeal foreign percentage depletion for nonfuel minerals. However, the Committee later dropped repeal of depletion for nonfuel minerals as part of an overall tax package.

The Treasury, in recommendations submitted to the Senate Committee on Finance in March 1974, did not propose any change in the percentage depletion deduction available for natural deposits (other than oil or gas) located in foreign countries. However, the Treasury recommended that the question be examined from time to time and adjustments be made when appropriate.

According to an April 1975 media report, it has been roughly estimated that mineral depletion allowances other than oil and gas cost the Government \$400 million in revenues in fiscal year 1974. However, such estimates are highly suspect, as the article cautioned that while oil and gas depletion have been thoroughly studied, other depletion allowances have not.

In our discussions with Treasury officials, we were told that foreign nonfuel depletion writeoffs represented about \$20 million in fiscal year 1973 and that these estimates were based upon non-Government estimates and were probably unreliable.

CONCLUSIONS

Our analysis of five mineral markets does not point to an urgent need for greater governmental involvement in assuring the security of U.S. mineral supplies. We believe, however, that a limited governmental role in increasing and diversifying foreign mineral sources is a positive way to improve security of mineral supply to the United States.

Although the Government has not promoted increased mineral production and source diversification, the programs of OPIC and Eximbank have encouraged this trend and they could assume a more dynamic role in promoting mineral diversification.

The extent that the Government has affected foreign mining exploration and development through tax law is not clear. U.S. tax treatment of foreign source income is a complicated issue and its effect on any one industry is difficult to isolate.

RECOMMENDATIONS

We recommend that the Congress explore with the Overseas Private Investment Corporation the role OPIC could play in the supply of raw materials to the United States. In making such a determination, the Congress should pay special attention to

- the role OPIC could play in diversifying foreign supply sources for minerals not available domestically,
- the relative importance of economic and developmental considerations in awarding OPIC insurance, and
- the possibility of modifying eligibility criteria to allow more flexibility in assisting projects beneficial to the United States.

If a determination is made that OPIC should have a larger role, the Congress should consider amending the Foreign Assistance Act of 1961, as amended, (22 U.S.C. 2191) to allow OPIC flexibility in

- financing mineral surveys (22 U.S.C. 2194),
- insuring projects which are less than 50-percent owned by U.S. citizens when the United States is expected to receive significant benefits from development of new mineral areas (22 U.S.C. 2198), and
- insuring mining projects in countries other than those classified as less developed when diversification of supply sources is evident (22 U.S.C. 2197).

With regard to changes in the U.S. tax code, the Congress should be cognizant of tax code changes tending to deter foreign mining investment when domestic self-sufficiency is not a practical alternative. In view of the apparent lack of information concerning the effect of current tax provi-

sions on international mining investment, the Congress should commission the Department of the Treasury to make such an evaluation.

AGENCY COMMENTS

OPIC agreed with our basic conclusion that the OPIC program has encouraged international mineral development. OPIC also agreed that it could assume a more dynamic role in promoting mineral diversification should the Congress wish.

Eximbank concurred with our conclusions that it should give special emphasis to resource development projects which will increase the world supply of mineral resources. In fact, Eximbank considered that, in carrying out its mandate to foster exports in general, supporting U.S. exports of mining and other equipment for resource development will be one of its principal objectives over the next decade.

We believe that each loan or insurance application must be reviewed on a case-by-case basis to determine if approval would have positive or negative effects on U.S. supply. The promotion of domestic production could be hurt if a potential domestic producer cannot obtain competitive financing. Also, OPIC insurance could negate the relative security of a domestic investment. Thus, safeguards should be developed to assure that domestic production does not suffer because of Government programs supporting export expansion and third world development.

The Department of the Treasury believed that we fairly portrayed the high degree of confusion on income tax rules which presently handicaps public policy formation. It also believed that a survey of the issues and qualitative assessment of the effects would serve a useful purpose in evaluating sundry stockpiles and "capacity storage" proposals. The Treasury suggested that the Congress limit the study to specific minerals, provide sufficient reporting time, and develop the mandate details with representatives of executive agencies.

CHAPTER 7

POLICY ALTERNATIVES FOR ASSURING THE CONTINUED AVAILABILITY OF MATERIALS

Proposals for greater Government involvement in protecting the U.S. mineral supply have come from many fronts, including the Congress, which is concerned about a possible repetition of the Arab oil embargo in other raw materials; the mining industry, which is concerned about the security of its investments; and the consumer, who is concerned about possible shortages of basic commodities and higher prices. Proposals have included Government

- promotion of expanded domestic production,
- subsidization of research and development in substitute materials and recycling,
- stockpiling to protect the U.S. economy against supply disruption and price gouging, and
- participation in international commodity agreements.

This chapter focuses on the last two of these proposals and evaluates the feasibility, benefits, and limits of stockpiling and international commodity agreements.

STOCKPILING TO PROTECT U.S. ECONOMIC INTERESTS

Before World War II the United States began stockpiling strategic and critical materials to be used in times of national emergency. Assumptions concerning a future national emergency have changed several times since the stockpile was established, as have the amounts deemed necessary to meet U.S. needs in case of a conflict. In April 1973, after a review of the national stockpile, the administration again reduced quantity objectives from \$4.8 billion to \$700 million. The Congress responded by approving the disposal of \$726 million in excesses of a few commodities; however, it has been hesitant to approve any further disposals.

Major factors which have led some Members of Congress to oppose administration disposal plans include

- high U.S. reliance on imports of certain critical materials,
- market conditions which showed many commodities in short supply and at increasingly high prices, and

--concern that other commodity producers might be able to successfully emulate the OPEC example and thereby drive up prices of the commodities they supply.

Congressional resistance to stockpile disposals has continued, and increasing attention has been given to the concept of stockpiling for economic as well as strategic purposes. Proponents of "economic" stockpiles argue that commodity supply disruptions and price gouging would be just as damaging to the U.S. economy as war. Economic stockpiling is currently being studied by the National Commission on Supplies and Shortages, created by the Congress in September 1974 "to facilitate more effective and informed responses to resource and commodity shortages."

Organizations such as the American Mining Congress, the Battelle Memorial Institute, and the International Economic Policy Association have gone on record as favoring economic stockpiling. The Policy Association favors the creation of a federally funded corporation to acquire and maintain stockpiles to serve the economic interests of the United States. Battelle recommends an economic stockpile "to limit price extremes damaging to the long-term interests of producers and short-term interests of consumers of raw materials."

Some industry spokesmen have stated that an economic stockpile is needed to protect the United States against commodity blackmail by foreign producers. They claim that only the Government is in a position to maintain stockpiles large enough to allow industry to continue operations in the event of a long-term supply cutoff. However, the American Mining Congress warns that:

"Release should be subject to Congressional authority and approved only to take care of industrial needs when raw materials are seriously inadequate because of arbitrary actions on the part of foreign producers or their governments. An over-eager response to industry demands for sale of stockpile materials in times of tight supply and rising prices due to normal economic factors will obstruct the natural function of a free market by which higher prices result in stimulating investment in added production."

Stockpile advocates generally agree that commodities stockpiled for economic purposes must be in addition to amounts held for strategic purposes. Some of the purposes of economic stockpiling include

--insurance against embargoes by foreign suppliers,

- protection of the U.S. economy against market shortages,
- protection against the detrimental effects of wide price fluctuations, and
- a psychological deterrent to foreign efforts to unreasonably increase prices or withhold supplies.

Commodities must be considered on an individual basis. A Brookings Institution economist summarized the issues to be faced in evaluating the need for economic stockpiles:

"You have to look at individual commodities and see if there is a real threat, what the cost is of maintaining stockpiles, how much is needed to deter the possibility of cartelization and other price gouging and, in the cases where the cost-benefit analysis shows, you should stockpile for economic security purposes."

Dr. James C. Burrows of Charles River Associates, Incorporated, testifying before the Joint Economic Committee of the Congress in July 1974, echoed this statement by warning of the danger of adopting across-the-board policies toward the mineral and metal industries without thorough review and analysis.

In weighing the pros and cons of economic stockpiling for individual commodities, specific objectives for the stockpile must be set and then evaluated to determine if stockpiles could achieve these objectives. We believe that some of the questions that should be addressed in evaluating the need for economic, as opposed to strategic, stockpiles include:

- What is the threat of supply disruptions and price gouging from foreign suppliers and the potential disruption to the economy?
- What is the cost of economic stockpiles?
- Could stockpiles effectively rectify commodity shortages?
- Could stockpiles stabilize prices and prevent the effects of wide price fluctuations?
- Could stockpiles effectively deal with price gouging?
- Could stockpiles be managed to avoid market disruptions?

--What impact would stockpiles have on international relations?

These questions, as they relate to the minerals we reviewed, are discussed in the following sections.

Assessment of threat

To determine the need for economic stockpiles, an assessment must be made of whether the economic security of the United States is threatened without them. Such an assessment should give special consideration to

--the potential susceptibility of individual commodities to foreign supplier cutoffs and price gouging and

--the impact of such a cutoff or price increase on the U.S. economy from the threat.

The degree of threat that is found to exist should then be compared to the cost of a stockpile deemed necessary to protect the economy.

Because of the uniqueness of individual commodity markets, commodities must be examined individually, with care taken not to generalize to all commodities. With this principle in mind, we assessed the degree of threat the United States faces from embargoes and price gouging initiated by foreign suppliers of five minerals. Chapter 5 of this report presents the results of this assessment.

Our findings represent world political and economic conditions at a given point in time; any major changes in the international climate could alter these results. Briefly stated, we found, in the cases of bauxite, manganese, nickel chromium, and tin, that major suppliers under present world conditions

--were not politically motivated to singly or collectively withhold supplies from the United States and

--were interested in maximizing revenues from mineral exports but were limited by market factors as to the amount they could increase price.

However, we believe the future security of the U.S. chromium supply should be viewed with some uncertainty due to past commodity embargoes and political differences between the United States and the two major suppliers--Rhodesia and the Soviet Union--and the lack of assurance that these problems will not recur. In addition, the adverse effects of a

chromium supply disruption on the U.S. industrial sector cannot be ignored--stainless steel cannot be manufactured without chromium.

With regard to the impact of price gouging on the U.S. manufacturing sector, we found that substantial price increases for these minerals only moderately affected other industries. We asked the Department of Commerce to simulate a number of price increases in the five studied minerals on its Cost/Price Pressure Model.

Commerce reported a moderate impact on other industries resulting from a 100-percent price increase in primary aluminum--about four-tenths of 1 percent in the manufacturing sector. In the case of 100-percent price increases in manganese and ferroalloy ores, including chromite and nickel, Commerce described the average impact on the manufacturing sector as "practically zero," with the greatest impact being felt in finished steel products--less than one-hundredth of 1 percent in both cases. Because Commerce's Cost/Price Pressure Model places tin in a category with several other commodities, it could not isolate the impact of tin price increases on other industries.

It should be noted that the hypothetical 100-percent price increases simulated in the model are much larger than could realistically be expected. For example, a 100-percent increase in the price of primary aluminum represents about a 1,000-percent increase in bauxite prices. The 1974 action by the Jamaican Government to raise taxes on bauxite production had the effect of raising the cost of Jamaican bauxite from \$15 a ton to \$30 a ton--an increase of 100 percent. Since the tax increase was designed to maximize Jamaica's bauxite revenues without causing consumers to switch to other supply sources or to substitute materials, it is presumed that Jamaica sought the highest returns practical at that time.

The cost of stockpiles

The cost of economic stockpiles depends upon their objectives and the size deemed necessary to accomplish these objectives. The uncertainties surrounding mineral markets complicates the process of estimating what size would be necessary. For example, to estimate the size of a stockpile adequate to deal with a supply disruption, one must estimate how long suppliers could afford to withhold supplies. The Battelle Memorial Institute warns in a 1973 report that to effectively influence price in the world market large stock piles would be necessary. The report stated:

"It is important that the buffer stock have sufficient reserves to meet all excessive market demand for as long as it lasts at the ceiling. If the buffer runs out of stock, the price skyrockets to a level consistent with the most scarcity-beset customer and then settles back slowly to the ceiling. The consumer is protected only as long as the stock holds out, then he suffers."

We did not attempt to estimate the size each mineral stockpile should be to meet various objectives set for them. The size would probably vary by mineral. However, to provide a framework for a discussion of cost, we calculated the values of two types of economic stockpiles, each large enough to meet 100 percent of U.S. demand for 1 year. The first is composed of mostly raw materials, with just enough processed materials to make up for the shortfall in U.S. processing capacity. The second is composed of the more costly processed materials.

GAO-calculated Value of Two Types of
Economic Stockpiles, Each Designed to
Meet U.S. Demand for 1 Year (note a)

<u>Material</u>	Type I Raw materials (note b)	(millions)	Type II Processed materials (note c)
Bauxite	\$ 162.4		\$ -
Alumina	148.5		-
Aluminum	570.2		4,093.2
Chromite	72.3		25.5
Ferrocromium	134.6		572.6
Manganese	104.5		21.4
Ferromanganese	118.5		515.3
Nickel	558.8		601.1
Tin	562.6		562.6
Total	<u>\$2,432.4</u>		<u>\$6,391.7</u>

^aAt September 1974 prices and at 1973 consumption rates.

^bBased on stockpiling raw materials up to 100 percent of U.S. processing capacity, with processed materials added to round out a 1-year supply.

^cBased on stockpiling processed materials with a minimum of raw materials needed for industries other than steel.

As previously mentioned, because these stockpiles would involve buying and selling commodities for economic rather than military purposes, amounts held for economic purposes should be in excess of amounts held in the U.S. strategic stockpile for national security reasons. The use of excesses in the strategic stockpiles toward building the economic stockpiles would reduce the purchases necessary for 1-year economic stockpiles. For example, if the excesses of the five case study materials on hand September 1974 were credited toward building the \$2.4 billion raw material stockpile, \$1.3 billion in new purchases would be necessary. Likewise, new purchases of \$5 billion would be necessary to round out the \$6.4 billion processed material stockpile. Appendix IV shows the amount and value of stocks in excess of strategic objectives as of September 1974 and the duration of the excesses if consumed at 1973 U.S. consumption rates.

The high cost of stockpiling is a major disadvantage which should be given close scrutiny. The question should be raised as to whether the cost of stockpiling should be charged to taxpayers rather than to industry. Also national priorities should be considered in determining if expenditures of this magnitude should be made for economic stockpiling.

Stockpiles to rectify commodity shortages

The Battelle Memorial Institute has suggested that stockpiles could be used to protect U.S. industry from temporary supply disruptions and to provide the United States instant reaction capability to scarcity problems. However, it appears that raw material stockpiles could not rectify the types of shortages which have most recently occurred. Testifying before the Senate Committee on Commerce and Committee on Government Operations in April 1974, we emphasized that recent shortages of basic materials in the United States appeared to be due to problems of tight industrial capacity rather than to raw material shortages. Should inadequate capacity continue as a major factor in commodity shortages, it may be necessary to stockpile processed materials as opposed to raw materials.

For example, a bauxite stockpile would not have alleviated the aluminum shortages of 1973-74; the root of the problem was surging world demand for aluminum coupled with insufficient processing capacity. Electric power shortages in the northwestern United States in 1973 reduced primary

aluminum capacity by about 10 percent. The shortage of aluminum was alleviated only by the industry drawing on its own inventories as well as from excesses in Government stockpiles. From July 1973 to June 1974, stockpile sales of aluminum totaled 952,600 tons. It should be noted that at this time there was no shortage of bauxite and, if needed, the supply could have been easily expanded because of the availability of bauxite reserves.

Some experts believe that the shortages experienced in 1973-74 may recur once the economy takes an upturn. A November 1974 report on material shortages by the Senate Permanent Subcommittee on Investigations, Committee on Government Operations, stated that existing aluminum plants were already fully committed and that projected new capacity was insufficient and would not meet the increasing demand that was expected. In a December 1974 statement prepared for the Committee, one industry source, concerned that the United States faces a critical aluminum supply situation in the time frame 1976-80, stated that:

"If a major expansion program by the aluminum industry was initiated right now, which they have not, its beneficial effects would not be apparent for at least 4-5 years * * * To meet a rather conservative forecast of increased demand, industry sources estimate an outlay of 15 billion dollars will be required over the next five years for new facilities."

Insufficient processing capacity rather than a shortage of ores may be a problem for other industries as well. A March 1974 congressional survey of industrial corporations, conducted by the Committee, sought to learn what commodity shortages had been experienced and why. Of the 500 corporations surveyed, only 4 reported a shortage of chromium; 5, of manganese; 12, of nickel; and 16, of tin. Responding corporations warned, however, that long lead times and the high cost of investment capital may impede introduction of new domestic processing capacity in some industries, including manganese and chromium. Environmental regulations, energy requirements, and the shift of processing capacity overseas where the ores are mined may also deter expansion of processing capacity in the United States.

Although other factors such as shipping delays, strikes, and other labor and transportation problems could cause temporary shortages of ores, as well as processed materials, it appears that insufficient processing capacity will remain an

important factor in future commodity shortages. In considering economic stockpiles, it should be recognized that for some minerals only the more expensive processed-material stockpiles would be effective in alleviating shortages of this nature. The high cost involved in stockpiling processed materials--about \$1 billion for a 3-month supply of aluminum--should be an important consideration in discussing economic stockpiles.

Stockpiles to stabilize prices

Through careful timing of stockpile purchases and sales, economic stockpiles theoretically could moderate cyclical price swings in the market. The sharp price swings which have occurred in some commodity markets, however, suggest that large stockpiles would be needed to deal with temporary imbalances in market supply and demand.

The failure of the 1973-74 tin disposals from the International Tin Council buffer stock and the U.S. strategic stockpile to stem rising tin prices illustrates the importance of stockpile size in stabilizing prices. In June 1973 the price of tin had risen to \$2.12 a pound and was rapidly approaching the \$2.26-a-pound ITC ceiling price. To keep the price from rising above the ceiling, ITC disposed of over 10,000 tons of tin from its buffer stock, leaving it essentially depleted. In December 1973 the price of tin closed at \$3.00 a pound, well above the ITC ceiling price.

Meanwhile, the U.S. Government disposed of about 40,800 tons of tin, representing about 20 percent of world consumption, from the U.S. stockpile. The administration stated that the move was made to fight inflation, bring the Federal budget into better balance, and reduce tin prices to a more reasonable level. Neither the ITC nor the U.S. stockpile disposals kept tin prices from rising above the ITC ceiling price. Instead, prices more than doubled, from \$2.12 a pound in June 1973 to \$4.70 in May 1974.

Other factors, in addition to inadequate stockpile size, have been cited for the failure of these disposals to stem rapidly rising prices--surging world demand, inadequate mining production, buyer speculation, increased fuel prices, and the closing of a tin smelter in England. The timing of the disposals also contributed to the failure to move prices downward. Because of political protests from major tin-producing nations concerned over the impact of large tin disposals on their respective economies, the United States agreed to spread out its disposals rather than to dispose of large quantities of tin at one time. This method lessened the economic impact on world tin producers but also lessened the impact on tin prices.

It should not be concluded from the example of the 1973-74 tin disposals that stockpiles cannot effectively control prices, because stockpile disposals have in some cases quite effectively reduced commodity prices. However, this example does point out that for some commodities only large stockpiles could effectively deal with the issue of price. The example also points out that economic stockpiling does not necessarily guarantee the Government's ability to control prices.

Stockpiles to counter price gouging

A basic problem in considering the use of stockpiles to counter price gouging is setting criteria to determine when price gouging is taking place. The Council on International Economic Policy defines price gouging as "an exorbitant administered price increase by one or more producers, exploiting a tight supply situation, to a level that can be maintained over the longer term only by restricting supply."

Government generally does not have access to industry production cost data to allow it to determine if a commodity price increase meets this definition of price gouging. Also, the minerals we studied, with the exception of tin, are not traded on commodity markets but are sold under contract with the producer at a negotiated price. Often the price includes items such as foreign taxes and royalties which vary according to the producer country. It would, therefore, be difficult to arrive at a universal "fair" price for a particular mineral.

Assuming price gouging is taking place, the Government must overcome a natural reluctance to dispose of stockpiles when needed for fear that the situation might get worse. For example, during the 1973-74 oil embargo, U.S. and European supplies were not drawn down due to the lack of knowledge of the duration of the emergency and the feeling that stocks should be saved for a possibly worse situation. It must be recognized that economic stockpiling is of no use unless the stocks are used when needed.

A second problem in using a stockpile to counter price gouging stems from the industry structure for some minerals. For example, the vertical integration which exists in the aluminum and ferroalloy industries would limit the effectiveness of bauxite, manganese, and chromium stockpiles in countering price gouging. Because the major companies are tied to long-term contracts with their suppliers, the Government might not find a market outside these companies for large stockpile disposals.

Furthermore, companies may not wish to break agreements with existing suppliers to purchase from the U.S. stockpile. For example, the major aluminum companies operating in Jamaica are required by law to pay taxes on minimum bauxite production levels, totaling about 13 million tons a year. These taxes must be paid whether the bauxite is actually produced or not. By purchasing from the U.S. stockpile to meet supply requirements rather than producing it themselves, the aluminum companies might end up paying taxes on bauxite not produced. Nonpayment of taxes could cause a takeover of the companies' Jamaican assets, estimated at over \$800 million. It is doubtful that these companies would choose to purchase from the U.S. stockpile realizing the possible consequences. Similarly, other mineral industries which are highly dependent on foreign suppliers would probably not risk alienating normal suppliers by purchasing from the U.S. stockpile.

The logistical problems of selling from the U.S. stockpile are somewhat less for minerals such as tin, which are traded in the market, than for minerals tied to long-term contracts. However, in the case of tin, the ITC members would most likely block attempts by the producer nations to unreasonably raise prices.

Stockpile management to avoid market disruption

The timing of stockpile purchases and sales would have to be carefully considered to avoid disrupting the market. For example, large Government purchases of a commodity at high prices and already in tight worldwide supply would increase prices and demand even more. To avoid this disruptive effect, the Government should not expect to acquire stockpiles instantly but would have to spread out its acquisitions.

One example of market disruption due to stockpile purchases occurred in chromite. During the 1950s the United States purchased over 6 million tons of chromite, artificially inflating its price. As a result, most chromite-producing nations rapidly increased their mining capacity, and chromite-consuming industries began competing with the Government to purchase needed supplies. When the Government stopped purchasing chromite in 1958, most producers were left with huge excesses which resulted in deflation of chromite prices for about the next 5 years.

A second consideration is the potential effects economic stockpiles might have on world mining expansion and research and development in new technology and substitution. The artificial lowering of prices through stockpile sales ob-

stucts the natural functions of the free market and could have the counterproductive effect of discouraging investments to expand production. Under conditions of tight supply and high prices, reduced production could result in an even tighter world supply and higher prices. Also, the psychological cushion afforded by a large U.S. stockpile might reduce industry's research and development efforts in substitution. Without the threat of shortages, research funding may be shortchanged in both Government and industry.

Effect of stockpiles on international relations

Another important consideration concerns the impact of stockpile management on international relations. The Battelle Memorial Institute report previously mentioned pointed out that a nation could not even contemplate building a stockpile without raising concerns by other nations. The report said:

"When a foreign nation signals even the slightest intention of entering into stockpiling as a national policy, it raises questions by others about its purposes, intentions, and management policies. * * * Questions as to whether stockpile management decisions and tactics will be stabilizing or unstabilizing, or a threat or a boon to one's own national interest are of great concern. In the absence of clarification, the prudent reaction is to assume the worst and take the act at first as an aggression and a threat."

The existence of national stockpiles poses at least a psychological threat to other nations, but the effects of actual operation of an economic stockpile may be more real than imaginary. Large stockpile sales which would be necessary to affect prices could seriously damage the economic stability of nations highly dependent upon production and sale of commodities. In our opinion stockpile management which appears to threaten producers' economic stability might trigger a reaction to engage in cartel action. The limited potential which exists for domestic production and substitution for the minerals we reviewed suggests continued reliance on foreign producers. The consequences of alienating producer nations upon which we are highly dependent for our mineral supply cannot be ignored when considering economic stockpiles for dealing with prices.

INTERNATIONAL COMMODITY AGREEMENTS

The competition created by each nation's building and operating economic stockpiles could be self-defeating and ineffective. U.S. interests might be better served by exploring other avenues to improve the stability of individual mineral markets.

Participation in international commodity agreements for selected commodities is one way the United States could demonstrate its willingness to open international dialogue on commodity problems.

Formal commodity agreements are composed of producing and, sometimes, consuming nations and attempt to stabilize commodity markets through various control mechanisms. These mechanisms include

- quotas to influence prices,
- contracts to fix prices for various trade volumes,
- exchange of market information,
- promotion of diversification, and
- coordination of production policy.

Some commodity organizations resulting from formal commodity agreements such as the International Tin Council maintain an international buffer stock and export controls as tools to deal with market instability.

Formal commodity organizations which exist for nonfuel minerals include ITC, the International Bauxite Association, the International Council of Copper Exporting Countries, and the Association of Iron Ore Exporting Countries. ITC, the only organization of the 4 which is open to consumers as well as producers, is composed of 7 producing nations and 22 consuming nations. The United States is the only major consumer nation which is not a member of ITC, although it has participated in the periodic renegotiations of the Tin Agreement and participates by invitation in meetings of the ITC Statistical Committee.

The U.S. Government in the past declined membership in ITC because of the opposition of domestic steel producers and partly because it believes few advantages could be derived from membership. U.S. steel producers believe that ITC is largely dominated by producing nations and the consuming nations have very little control over its actions.

Past doubts of the effectiveness of commodity agreements have not been limited to ITC.

Skepticism of commodity agreements in general is illustrated by a policy statement prepared by the Department of State for use in the April 1974 discussions on manganese ore:

"In theory commodity agreements can stabilize prices within a given price range * * *. In practice, it has proven possible in some cases to prevent prices from going through a floor by withholding supplies from the market. In certain other cases * * * cheating by exporting countries has undermined the effectiveness of the price floor.

"Developing countries are not usually satisfied to maintain prices above some minimum floor level; they wish as a rule to employ commodity agreements as a means of raising prices above an equilibrium level. The problem with such an approach is that it encourages substitution or encourages production by higher cost producers who may not wish to cooperate in the commodity agreement. The result is a tendency of the agreement to break down."

The State Department also recognizes that certain technical problems would have to be overcome in operating an effective agreement for certain commodities. For example, it is difficult to identify the effect of an agreement on price, production, and trade of commodities under long-term contracts between different parts of an integrated company rather than on the open market. State points out that the difficulty of regulating aluminum prices, due to the integration of the aluminum industry, was one factor that led some bauxite countries to use an export tax to increase revenues.

Despite the technical problems associated with formal commodity agreements, there appears to be some justification for considering U.S. participation in agreements for selected commodities. For example

- the damaging effects of wide price fluctuations for some commodities may continue in the absence of attempts to stabilize prices;
- commodity agreements may be concluded where technically feasible, regardless of U.S. opposition;
- nonmembership could mean higher prices and supply problems to U.S. consumers if member nations are given priority treatment; and

--U.S. refusal to participate in commodity organizations might be construed as a display of indifference to the plight of developing nations dependent upon raw material export earnings for development and could lead them to embrace more radical economic and political ideologies.

Recently, the Department of State, as if recognizing the drawbacks of its stand on commodity agreements, has expressed a willingness to consider international arrangements on commodities "on a case-by-case basis." The United States is also considering signing the Fifth International Tin Agreement, which will become effective in July 1976, and becoming a member of ITC.

It is not clear at this time whether U.S. participation in formal commodity agreements can guarantee concrete benefits to the U.S. consumer. It is clear, however, that the technical problems surrounding the implementation of commodity agreements will limit such accords to only selected commodities.

CONCLUSIONS

At the time of our study major suppliers of the five case study minerals were

--not politically motivated to withhold supplies from the United States and

--interested in maximizing revenues from mineral exports but were limited, particularly in the long term, as to the amount they could raise prices.

Accordingly, we believe that economic stockpiles are not needed except in the case of chromium, where the threat of a political embargo is manifested by the fact that

--political relationships between the United States and two major producers have been strained and embargoes have taken place in the past,

--sources are limited and reserves and resources are concentrated in only a few countries, and

--a supply cutoff would seriously affect a sector of U.S. industry since chromium is essential in the manufacture of stainless steel.

With regard to economic stockpiles to protect U.S. consumers from price gouging and shortages and to improve market stability, we believe that a full examination of the technical problems associated with their operation is needed. More important, the implications of increased Government participation in the market must be fully understood. Further analysis of buffer stockpiles should be made on a case-by-case basis and should consider that

- to control and/or stabilize prices, buffer stocks need to be large;
- to rectify shortages which generally have been caused by processing-capacity shortages, buffer stocks need to be made up of high-cost processed materials;
- to attack price gouging, buffer stocks may not be feasible if U.S. corporations believe that their long-term interests are better served by acquiescing to host country demands rather than by purchasing from Government stockpiles.

We believe that it is important that a stockpile policy be integrated with an overall mineral policy which takes a broad approach, considering the interdependent world that now exists. Accordingly, consideration of stockpiles to deal with commodity problems should not be isolated from other alternatives such as domestic production, substitution, conservation, and commodity agreements.

In the area of commodity agreements, the shifting of bargaining leverage and the instability within many of the mineral markets provides sufficient justification for the United States to consider membership in international commodity agreements. However, the technical problems associated with the workings of successful agreements will probably limit the number of cases where useful accords can be reached, particularly for nonfuel minerals. Consideration of commodity agreements on a case-by-case basis appears to be the proper course of action.

AGENCY COMMENTS

The Department of Commerce, the General Services Administration, and the Office of Management and Budget generally agreed with our assessment of the embargo threat and therefore did not see a need for emergency economic stockpiles. In addition, the Department of Commerce stated that there

was a serious question of the need for economic stockpiles because the threat of supply interruption, price gouging, and sustained high prices due to producer action is very limited. The General Services Administration believes that the use of the strategic stockpile as an economic buffer would involve a conflict of goals and could result in inadequate protection of the Nation's vital security interests.

With regard to commodity agreements, the Department of Commerce also agreed that examination of international commodity markets on a case-by-case basis shows that the potential for formal agreements involving regulation of trade is extremely limited.

In general, we believe that greater attention should be paid to basic alternatives to economic stockpiling including substitution, economic development of domestic resources, and diversification of suppliers. For those minerals where domestic production is impractical, we believe that as the political relationships between the United States and producers are improved the need for economic stockpiles is reduced.

CHAPTER 8

SCOPE OF REVIEW

In view of the concern over the mineral outlook since the oil embargo, we reviewed five minerals to determine the reliability of foreign sources in providing the United States an uninterrupted supply of minerals at reasonable prices. Issues relating to the security of supply, as well as the economic determinants of price, were addressed in the review. The minerals included in our study were bauxite, chromite, manganese, nickel, and tin.

Documents, memorandums, and other records were reviewed, and discussions were held with officials at the Departments of State, the Interior, Commerce, and the Treasury; the General Services Administration; the Export-Import Bank of the United States; and the Overseas Private Investment Corporation. Field visits to Canada, Jamaica, Brazil, Gabon, Australia, South Africa, Thailand, and Malaysia provided the opportunity to obtain the views of Embassy, mining, and foreign government officials.

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SYNOPSIS OF SELECTED COUNTRY MINING POLICIES

This appendix provides a brief synopsis of the mining policies of selected supplier countries of the case study minerals. Emerging characteristics of both developing and developed countries in the world resource market include

- policies aimed at achieving national control of resource industries;
- efforts to maximize revenues from resource exports;
- realization by many host governments that the need to attract additional foreign investment to finance additional development limits taxes and controls which can be placed on mining corporations; and
- in some cases, the formation of producer organizations as a means to improve bargaining positions with the mining companies.

POLICIES IN LESS DEVELOPED COUNTRIES

While the Caribbean area provided 68 percent of U.S. bauxite/alumina imports in 1973, in the long term its share of U.S. imports is likely to decline. For several years U.S. aluminum companies with investments in the area have not expanded, despite host government efforts to encourage expansion. Instead, U.S. companies have favored investments in the larger, new bauxite areas in Africa, Asia, Australia, and Brazil. Because substantial investment had been made and supply dependency existed, bauxite-producing countries realized that they were in a strong bargaining position to increase taxes on the bauxite industry.

Because bauxite revenues had leveled off or were declining, the Jamaica and Surinam Governments felt that the new tax levies were justified. The countries still hope that aluminum company operations in the area will be expanded.

At the time of our field examination, Jamaica, the largest U.S. supplier, was negotiating with one U.S. company to expand operations. In December 1974 Jamaica reached agreement with Kaiser Aluminum and Chemical Corporation over land ownership and equity participation issues. Jamaica would prefer to double its present level of production but is sensitive to the fact that it does not have equity participation in the aluminum company operations. U.S. companies have not generally objected to Jamaica's gaining equity participation, their primary concern being the terms of compensation. In any event, aluminum company officials in Jamaica

believe phase II negotiations between Jamaica and the aluminum companies over equity participation and land ownership should not affect the physical availability of bauxite supplies to the United States.

Surinam, the second largest U.S. bauxite supplier, has sizable bauxite reserves which it would like developed. However, uncertainties arising from the independence of Surinam from the Netherlands at the end of 1975 and persistent rumors that an independent Surinam might nationalize the bauxite industry have cooled U.S. company interest in expansion. Surinam is heavily dependent on bauxite tax revenues and would like expanded bauxite investments; however, the recent Surinam bauxite tax increase will not help matters.

The Dominican Republic and Haiti would both like expanded bauxite mining plus company investment in alumina refining. U.S. companies involved are resisting the latter demand, claiming the reserves are too small to justify the investment. Despite this conflict company officials see little difficulty in reaching agreements.

Guyana, supplier of 11 percent of U.S. bauxite imports in 1973, hopes to achieve a completely socialized economy which would also be devoid of major foreign investment in its bauxite industry. This latter objective was achieved by nationalizing the operations of a Canadian aluminum company in 1971 and the operations of a U.S. company on January 1, 1975. Given the past experience with the Canadian firm, Guyanese bauxite will continue to be available to the U.S. market.

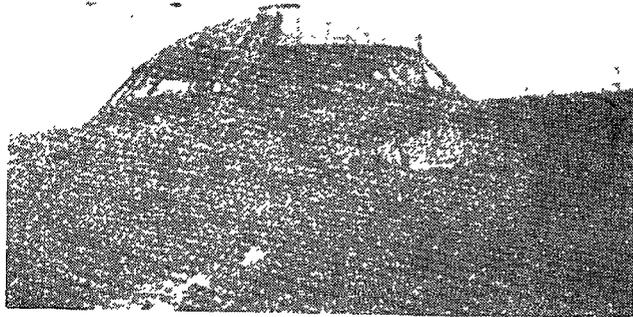
Guinea has bauxite reserves second only in size to Australia. Its Marxist government desires rapid expansion of bauxite production while also seeking foreign investment in alumina-processing facilities. Government policy requires equity participation in mining projects and, consequently, Guinea as of June 30, 1974, had a \$75 million debt obligation to the World Bank. In addition to meeting debt payments, Guinea is dependent on bauxite exports for vital foreign exchange.

The Bureau of Mines has estimated that the Jamaican tax has made Guinean bauxite or alumina considerably cheaper than Jamaican bauxite or alumina. Early indications are that Guinea, an IBA member, is expanding production and has indicated to foreign-owned companies that it plans to raise bauxite taxes. However, Guinea is expected to make only moderate demands on the aluminum industry in the near future because of its pressing need for foreign exchange and its desire to attract additional foreign investment.

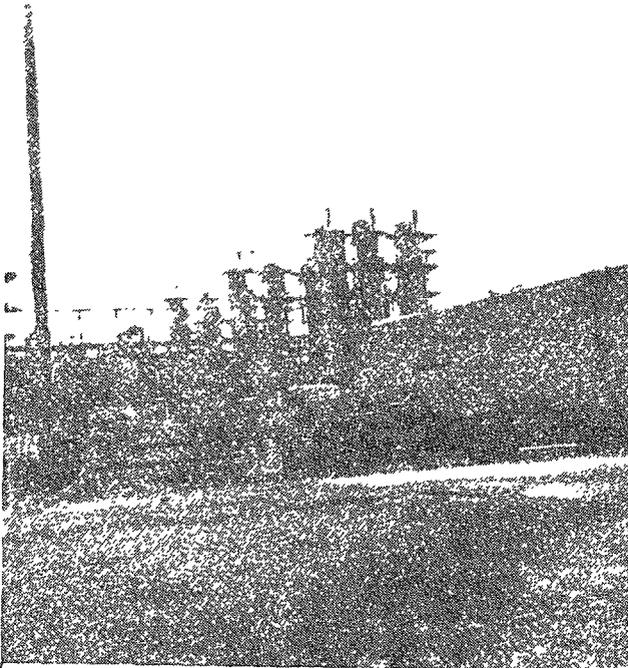
Jamaica Bauxite/Alumina



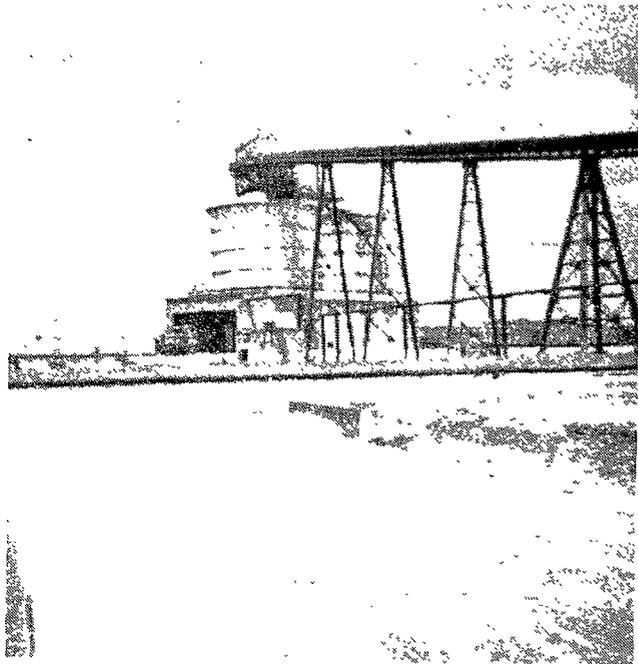
Bauxite strip mine.



Bauxite storage facility.



Alumina processing plant.



Alumina storage facility.

At the time of our review, Ghana, which possesses cheap hydroelectric power resources, was negotiating with one American and two Japanese companies over proposed bauxite mining, alumina refining projects, and aluminum production facilities which would create an integrated industry. At the time of the Jamaican tax increases, the State Department felt that Ghana would take advantage of that opportunity to expand its industry. However, at the November 1974 meeting of the IBA in Guyana, Ghana gained membership to the producer organization and will likely strike a hard bargain for access to its bauxite resources.

Large revenues from oil exports have led Indonesia to a more selective governmental policy toward foreign mining investment. The oil revenues are permitting increased Indonesian participation in mining the country's considerable mineral wealth. The Indonesian Government is formulating a national mining policy to maximize control of mining operations. Certain mining areas have been reserved completely for national companies, while majority Indonesian equity participation is required for large capital investment projects involving direct foreign investment.

Indonesia wants investment by foreign companies which will provide the advanced technology and large capital resources required to bring some mining opportunities to realization. It particularly encourages investment in mineral processing facilities. In this regard Indonesia is negotiating with American and Japanese companies over investment in an integrated bauxite-to-aluminum project. Additionally, multinational nickel companies are establishing or exploring the feasibility of nickel-mining projects.

Despite the fact that Indonesia has tremendous nonfuel mineral resources as yet untapped, it is not willing to sell these cheaply to encourage increased investment. It is a member of OPEC and ITC and has expressed interest in IBA membership despite the fact that its bauxite industry is barely established. At the time of our review, Indonesian mining tax laws were being revised to obtain greater revenues for the government.

Gabon, on the West Coast of Africa, has derived substantial benefits from its mineral wealth. It has become a significant exporter of oil, uranium, and manganese. Its manganese ore deposits are some of the largest and richest in the world.

A former French colony, Gabon has mineral wealth which has resulted in worldwide investment interest. This interest has come primarily from Japan, Europe, and the United States,

but Gabon, realizing the strength of its bargaining position, has been selective in choosing foreign investment projects. At the same time, the government seems to recognize that Gabon can only capitalize on its mineral wealth through foreign investment, which generally requires a favorable economic and political climate.

Gabon's mining code provides for government equity participation up to 60 percent. In the case of la Compagnie Miniere de l'ogooe, the sole manganese operation in the country, the government has a 10-percent equity share, with the remaining equity nearly evenly split between French and U.S. interests. The company is on good terms with the government. In this regard, one government official told us that the company shares identical interests with the government. These interests include plans for doubling present mining production by 1980, preserving the company's mining position in Gabon, and establishing a small ferromanganese production capacity. It is estimated that about 150,000 tons of ferromanganese will be produced in Gabon by 1980.

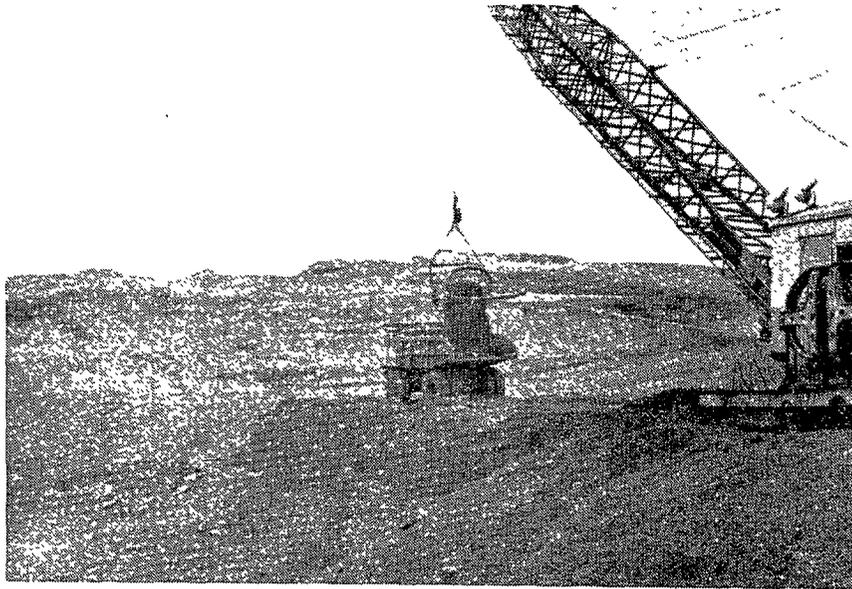
The Gabonese Government actively supports the concept of producer alliances to boost commodity prices, is a member of OPEC, and was involved in the recent organization of a producer alliance to cover African timber exports.

Malaysia and Thailand, which together provide 72 percent of U.S. tin imports, are unlikely to participate in cartel-like actions to increase tin prices. A strong reason for this assessment is that the two countries, along with Indonesia, have studied the potential for a tin producers' cartel and have concluded that such an organization is not feasible.

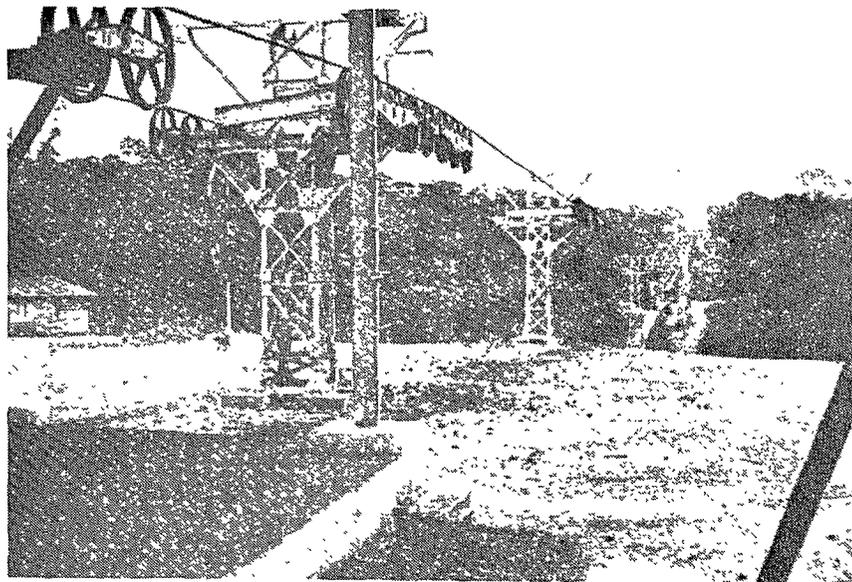
The tin producing countries (Malaysia, Thailand, Bolivia, Indonesia, Nigeria, Zaire, and Australia) have reaffirmed their reliance on the International Tin Agreement in which 22 consumer countries (excluding the United States) are participating. A new 5-year agreement--the fifth--was negotiated during May and June 1975 in Geneva, to take effect on July 1, 1976. The agreement provides for buffer stock operations to keep tin prices within a given range.

The Brazilian Government, interested in sustaining the country's rapid economic growth, seeks development of its mineral resources. However, Brazil does not possess the capital resources to achieve its development goals and will require foreign investment. The government has tended to limit foreign ownership in large mining projects to a minority position under established guidelines.

Manganese Mining in Gabon



Loading operations at Moanda mine.



World's largest cableway transports manganese from Moanda 49 miles to Congo-Brazzaville border; then 300 miles by rail to seaport.

Because Brazil has a stable, growing economy and planned hydroelectric power facilities which will offer cheap power, its future is probably not as a mineral exporter but as a metal exporter. In the 1980s Brazil is expected to be a steel and aluminum exporter. Until that time it is encouraging rapid growth in ore exports to provide the cash flow needed to finance the processing facilities.

Brazil is not opposed to producer alliances and would likely join a bauxite alliance if it felt such membership would serve its national interest. However, our discussions with both Brazilian Government officials and U.S. business executives in Brazil indicate that because of the country's desire to expand, both in terms of output and processing operations, participation in any producer group which would restrict supplies would not be in its interest.

POLICIES IN DEVELOPED COUNTRIES

Less developed countries are not the only exponents of economic nationalism. Australia and Canada, long favored as stable locations for mining investment, have been formulating national mining policies which will impose greater restrictions on the private sector. The political process of formulating mining policy has resulted in considerable investment uncertainty, acting as a disincentive to new mineral exploration and investment. This situation may continue until business and government can compromise on conditions for future mining investment.

In April 1973 Canadian ministers, responsible for mineral policy in their respective provincial governments, and the Canadian Federal Government concluded a series of meetings on formulating a national mineral policy. The principal goal of the policy was to optimize the national benefit from present and future use of minerals. Growth of the mining industry was to be reviewed in terms of the benefits which would accrue to the national economy. Thus, mineral-processing investment was to be encouraged, so that the country could realize the joint benefits of industrialization and maximization of export revenues.

Those resources in limited supply were to be conserved either to assure future availability for Canadian industry or to prevent competition with foreign supplies, which might lead to oversupply in world markets and an unsatisfactory return from mineral exports. The abundance of Canadian nickel reserves indicates that conservation efforts would probably not focus on nickel. In all cases, future mining investments were to be reviewed in terms of contribution to regional development, protection of the

environment, and minimization of foreign control in the Canadian mining industry.

The Canadian national policy implicitly called for a more active role by government. One aspect of this larger government role has been provincial government consideration of participation in future exploration and mining projects. Some western provinces have considered nationalizing certain mining operations. The national policy called for comprehensive surveillance of the policies of consuming nations and international corporations which would serve to maximize Canadian return on mineral exports. In this regard, the policy pronouncement concluded that producing nations share common interests in achieving maximum and stable returns on their mineral exports, and this could be best achieved through formalized information sharing.

The major initiative resulting from the new policy has been proposals by the provincial governments and the Canadian Federal Government to raise mining taxes. Varying with provinces, the proposed taxes could raise the aggregate tax rate on mining companies from a possible 73 percent to rates approaching 100 percent over levies existing at the time of our review. The prospect of such tax rates, plus the confusion generated by a lack of provincial and Federal Government coordination of tax proposals, may reduce new investment in mineral exploration and development activity.

Canada opposes efforts by producers to form restrictive cartels. It has also rejected proposals by France, Switzerland, and Japan to conclude restrictive bilateral supply agreements, claiming such agreements were unworkable, given the Canadian market structure. Canada's orientation toward producer groups seems to be aimed at stabilizing markets to provide producing nations with acceptable returns from the sale of their resources.

During the 1960s Australia was the lodestar of the international mining industry, and companies scrambled to gain access to its rich mineral reserves. By 1974 foreign mining investment was at a standstill.

The basis for this reversal was the mineral policy of the Labor Government which came to power in 1971. The government was concerned that it was selling its minerals too cheaply, benefiting the foreign mining companies and the consuming nations, and demanded a better deal for Australians. The government talked of restricting additional foreign investment and leaving the job of developing its mineral wealth to the government or domestic industry and held up several mining investments because of planned majority

foreign ownership. It also imposed stricter environmental standards on mining operations.

Other Australian Government policies have adversely affected the mining industry, despite the fact that they are not directly aimed at the industry. Australian efforts to centralize power within the Federal Government, at the expense of the State governments which have been the principal negotiators with foreign investors, have added to the general investment uncertainties. Various inflation-fighting measures have also heavily affected the industry. As a result of these factors, contemplated mining investments have been deferred.

Internationally, the Australian Government has sought balance between consuming and producing nations. While complaining of foreign mining companies playing one producer against another to negotiate low mineral prices, the Australians have also been concerned with preventing any disruption of established trade relationships and with assuring consumers that existing contracts will be honored. Government officials have offered repeated assurances that Australia will not participate in a cartel.

South Africa is committed to rapid economic growth through the development of its private industry in a laissez-faire atmosphere. Mining and mineral-processing revenues are important foreign exchange earners. Generous tax and other incentives are offered to foreign investors for both mining and processing operations. This established governmental policy makes it unlikely that the government would impose controls or take actions to create unreasonable price increases or would participate in an embargo against the United States.

South African Government participation in a producers' alliance seems unlikely, as its internal racial policies have isolated it from the developing and Communist worlds. At the time of our review, the ties between South Africa and Rhodesia were also becoming more uncertain, as South Africa moved toward developing trade and diplomatic ties with black Africa. South Africa is still politically isolated from most developing countries, and continued support by developed countries will depend to a large extent on the stability of South Africa as a trading partner and on a more flexible internal policy towards blacks.

South African chromium and manganese reserves are large, and the potential for expansion is great. We believe that efforts by other major producers to increase prices of their higher grade ores may stimulate the South African

industry. Also, political instability in other producing countries could further increase the attractiveness of investment in South African mining.

As pointed out in chapter 3, the Congress enacted legislation permitting the importation of strategic materials from Rhodesia despite United Nations economic sanctions. There has been considerable controversy as to whether the Congress will continue to uphold the legislation. However, it is clear that the availability of Rhodesian imports to U.S. users is largely a function of U.S. policy. Supporters of trade with Rhodesia have argued that the United States was becoming too reliant upon the Soviet Union for chrome imports, which was not in the national interest. Supporters of the U.N. trade embargo argue that the levels of imports from the Soviet Union have continued after the United States lifted its embargo of Rhodesian imports and that U.S. violation of the U.N. sanctions has damaged U.S. relations with other African nations. The emergence of Rhodesia as a major U.S. ferrochrome supplier has further complicated the issues.

Despite the U.N. action Rhodesia has maintained its economic activity, as indicated by a mineral production increase from \$104 million to \$310 million since 1965. Rhodesia has large chromite reserves; however, it has encouraged the exports of ferrochrome for the greater revenues. As already pointed out in chapter 3, Rhodesia supplied about 37 percent of U.S. ferrochrome imports in 1973. Union Carbide has ferrochrome investments in Rhodesia; however, we were told by company officials that these investments are now state controlled and that Union Carbide has no control over Rhodesian ferrochrome exports.

Rhodesia is facing increased economic and political pressure to solve its internal problems. The black majority is demanding majority rule, and Rhodesia's historical ally, South Africa, is pressing for a quick solution to Rhodesia's problems. Also, neighboring Mozambique, which provides Rhodesia with important outlets to the Indian Ocean, is about to come under black rule.

Figures concerning the Soviet chromium industry are unreliable. However, Soviet chromite reserves are considered to be large, as partially evidenced by the fact that the Soviet Union has become the primary world supplier, excluding South Africa. U.S. imports of Soviet chromite have ranged between 16 and 41 percent of total imports in the 10-year period 1964-73. It has been estimated that about 11 percent of the total Soviet chromite production was exported to the United States in 1973. To date, the Soviet Union has supplied only chromite ore to the United States. However,

evidence suggests that the United States may receive imports of ferrochrome from the Soviet Union in the future, even though the tariff on Soviet ferrochrome imports would be prohibitively high unless most-favored-nation status were granted.

In evaluating the reliability of U.S. chrome imports from the Soviet Union, the United States cannot ignore the possibility of supply disruptions, whether due to political misunderstanding between the two countries or unilateral action by the Soviet Union to meet revised internal objectives. Although the Soviet Union has been a consistent U.S. chromite supplier in recent years, it ceased chromite exports during the Korean War and did not resume them until 1959. Also, as pointed out in chapter 4, the Soviet Union in 1950 embargoed almost all manganese trade with the free world, including the United States.

However, the detente between the United States and the Soviet Union suggests that only a serious issue would result in a disruption in the Soviet chromium supply line. In the past 20 years, the United States and the Soviet Union have taken opposing views on many issues. However, even during two of the most notable--the Cuban missile crisis and the Vietnam War--chromite supplies from the Soviet Union continued. According to a research report by the Student and Young Adult Division, United Nations Association of the U.S.A., during the 1962 Cuban missile crisis the Soviet Union increased shipments of metallurgical chromite to the United States by 13 percent. During the 1966-70 Vietnam War buildup, it increased U.S. exports 112 percent over the previous 5 years. As shown in the schedule on the next page, during the years the United States honored the U.N. sanctions on Rhodesia, U.S. imports of Soviet chromite increased. The United States has continued chromite trade with the Soviet Union since the breaching of the U.N. sanctions.

1
U.S. Imports of Soviet Union
Chromite Ore for
1963 to 1973
(thousand short tons)

Years	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Imports	192	275	242	302	299	335	318	496	307	434	242
Percentage of U.S. Consumption	.14	.19	.16	.16	.24	.31	.29	.35	.24	.41	.26

^aThe United States observed U.N. sanctions on Rhodesia during these years.

OPIC-INSURED INVESTMENTS
IN BAUXITE, ALUMINA, ALUMINUM, NICKEL, AND TIN

AS OF APRIL 1974

<u>Mineral</u>	<u>Country</u>	<u>Number of contracts</u>	<u>Maximum OPIC insurance liability</u>		
			<u>Currency inconvertibility</u>	<u>Expropriation</u>	<u>War</u>
			(millions)		
Bauxite	Brazil	5	\$ 31.7	\$ 24.9	\$ 18.5
Alumina	Ghana	2	64.0	54.0	54.0
Aluminum	Guyana	1	-	14.3	14.0
	Jamaica	10	35.0	491.9	491.9
	Guinea	7	107.4	112.7	64.7
	Iran	2	4.6	4.6	4.6
	India	8	3.1	3.1	4.9
	Zambia	1	.7	.7	.7
	Thailand	1	1.0	1.0	1.0
	Venezuela	2	8.3	8.3	8.3
	Korea	2	.4	.3	.3
	Turkey	1	.4	.4	.4
	Argentina	1	1.4	-	-
			<u>43</u>	<u>258.0</u>	<u>716.2</u>
Nickel	Botswana	4	10.0	21.1	23.4
	Dominican Republic	2	185.0	189.3	189.3
	Indonesia	2	-	7.5	-
		<u>8</u>	<u>195.0</u>	<u>217.9</u>	<u>212.7</u>
Tin	Bolivia	3	1.2	1.2	1.6
	Brazil	1	.9	.9	.9
	Thailand	3	4.6	5.4	6.2
		<u>7</u>	<u>6.7</u>	<u>7.5</u>	<u>8.7</u>
Total		<u>58</u>	<u>\$ 459.7</u>	<u>\$ 941.6</u>	<u>\$ 884.7</u>

GAO note: OPIC had no active insurance contracts in the mining or processing of manganese or chromite as of April 1974. Figures shown represent OPIC's current liability for these projects which, as of April 1974, totaled \$266.8 million for currency inconvertibility, \$849.4 million for expropriation, and \$795 million for war.

EXPORT-IMPORT BANK DIRECT CREDITS AND FINANCIAL GUARANTEES ON NICKEL,
MANGANESE, AND BAUXITE PROJECTS AS OF JUNE 30, 1975 (note a)

<u>Mineral/ location</u>	<u>Project</u>	<u>Date authorized</u>	<u>Direct Eximbank loans (millions)</u>	<u>Financial guarantees (note b)</u>	
				<u>On commercial loans</u>	<u>On local costs</u>
				<u>(millions)</u>	
<u>NICKEL</u>					
Australia	Development of nickel bearing laterite	9/71	\$ 9.1	9.0	-
	Development of nickel bearing laterite	6/75	0.6	-	-
Indonesia	Development of nickel deposits	12/72	13.5	13.5	4.5
	Development of nickel deposits	1/75	35.0	35.0	-
Guatemala	Nickel producing facility	6/73	13.5	13.5	4.5
Philippines	Nickel mining project	3/71	27.0	27.0	-
Yugoslavia	Ferronickel mining project	5/74	38.7	38.7	12.9
			\$137.4	\$136.7	\$21.9
<u>MANGANESE</u>					
Brazil	Manganese pellet plant	7/69	5.5	-	-
Mexico	Manganese mining and processing	2/66	5.0	-	-
			\$ 10.5	0	0
<u>BAUXITE</u>					
Brazil	Aluminum plant expansion	12/73	5.0	-	-
	Bauxite mining processing	3/75	9.9	-	-
Guyana	Walking dragline	3/73	1.7	1.7	-
	Walking dragline	1/74	1.9	-	-
	Mining equipment	1/74	1.7	1.7	-
Venezuela	Aluminum product manufacturing	6/65	20.5	-	-
Yugoslavia	Aluminum rolling mill	6/64	1.9	-	-
	Expansion of aluminum facilities	5/74	4.3	4.3	-
Mexico	Bauxite processing	5/61	6.5	-	-
	Aluminum products manufacturing plant	7/65	1.8	-	-
	Fabricating equipment	1/70	0.5	0.5	-

Mineral/ location	Project	Date authorized	Direct Eximbank loans (millions)	Financial guarantees (note b)	
				On commercial loans	On local costs
India	Aluminum reduction plant	1/60	13.7	-	-
	Aluminum products manufacturing	3/63	5.0	-	-
	Aluminum reduction plant	7/64	11.0	-	-
	Nonferrous alloys	2/67	2.0	-	-
	Expansion of aluminum facilities	7/72	2.7	2.7	-
China (Taiwan)	Aluminum production	11/72	9.9	9.9	3.3
Guinea	Bauxite mining project	10/68	25.0	-	-
Ghana	Aluminum smelter	1/62	123.8	-	-
	Expansion of aluminum smelter	12/68	10.5	-	-
United Kingdom	Aluminum rolling mill	11/73	5.2	5.2	-
			<u>\$264.5</u>	<u>\$26.0</u>	<u>\$3.3</u>
		Total	<u>\$412.4</u>	<u>\$162.7</u>	<u>\$25.2</u>

96

a Eximbank had no active loans or guarantees for tin or chromium as of June 30, 1975.

b In addition to direct dollar loans, Eximbank extends financial guarantees on (1) commercial loans for purchase of U.S. goods and services and (2) local costs associated with the purchase, such as public utility connections, labor, and equipment installation.

SOURCE: Eximbank

AMOUNT AND VALUE OF STOCKPILED MATERIALS
IN EXCESS OF STRATEGIC OBJECTIVES AS OF SEPTEMBER 1974 AND
DURATION IF CONSUMED AT 1973 U.S. CONSUMPTION RATES

Material	Stocks in excess of strategic objectives		Duration of excess at 1973 U.S. con- sumption rates
	<u>Amount</u> (note a)	<u>Value</u> (millions)	
Bauxite	9,520,881	\$ 100.5	7 mos.
Alumina	-	-	-
Aluminum	13,183	9.5	1 day
Chromite	2,059,850	122.5	^b 18 mos.
Ferrochrome	710,111	767.2	19 mos.
Manganese	3,553,824	135.7	22 mos.
Ferromanganese	418,420	136.2	4 1/2 mos.
Nickel	-	-	-
Tin	168,615	1,618.3	31 mos.
		<u>\$2,889.9</u>	

^aAll materials in short tons (2,000 lbs.), except bauxite which is measured in long dry tons (2,240 lbs.).

^bMuch of the stockpiled chromium is of poor quality and therefore represents less than the calculated 18 months' supply--possibly only 6 months' supply.

UNITED STATES OF AMERICA
GENERAL SERVICES ADMINISTRATION
WASHINGTON, DC 20405



AUG 6, 1975

Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
Washington, D. C. 20548

Dear Mr. Staats:

This is in reference to the GAO draft report entitled "United States Dependence on Non-fuel Mineral Imports: Implications and Policy Alternatives." Our comments were requested in a letter dated July 2, 1975, from Fred J. Shafer, Director, Logistics and Communications Division, United States General Accounting Office.

I believe the study in general provides a good analysis of five imported critical materials and makes a valuable contribution to the increasing literature on the materials situation. I am concerned, however, about certain references to the national stockpile, as indicated below.

In the second paragraph on page 4, reference is made to the purpose of the national stockpile and to the assumptions underlying the determination of the size and composition of the stockpile. I feel that the current wording does not adequately express the goal of this stockpile and that the description of "assumptions" includes items that are data inputs or conclusions rather than assumptions. This paragraph would be more correct if the first two sentences were rewritten along the following lines:

The Government has created the stockpile of strategic and critical materials to protect the United States against dangerous and costly dependence upon foreign sources of supply in a period of national emergency. Many factors are considered in the determination of stockpile policy. Some of the principal factors are: the nature of a potential conflict (e. g., the length and magnitude of possible wars; the number of fronts on which a potential conflict might be fought; the size of the military force); the availability of imports; the possibility of foreign supply disruption; the amount that domestic production can be expanded; and the extent to which civilian consumption can be restricted by austerity measures.

Keep Freedom in Your Future With U.S. Savings Bonds

The next-to-last sentence in the same paragraph also raises an issue of interest to us. GSA does not support the possible use of the strategic stockpile as an economic buffer. I believe that such use would involve a conflict of goals and could result in inadequate protection of the Nation's vital security interests.

A number of minor technical and editorial suggestions have been proposed by my staff, and these have been transmitted informally to Mr. Hunter of your staff by telephone.

I appreciate the opportunity to review your draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Sampson", with a long horizontal flourish extending to the right.

Arthur F. Sampson
Administrator

GAO note: Page number references in this appendix may not correspond to pages of this report.



DEPARTMENT OF STATE

Washington, D. C. 20520

AUG 8, 1975

Mr. J. K. Fasick
Director
International Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Fasick:

I am replying to your letter of July 2, 1975,
which forwarded copies of the draft report:
"United States Dependence on Non-fuel Mineral
Imports: Implications and Policy Alternatives."

The enclosed comments were prepared by the
Deputy Assistant Secretary for the Bureau of
Economic and Business Affairs.

We appreciate having had the opportunity to
review and comment upon the draft report. If
I may be of further assistance, I trust you will
let me know.

Sincerely,

A handwritten signature in cursive script, appearing to read "Daniel L. Williamson".

Daniel L. Williamson
Deputy Assistant Secretary
for Budget and Finance

Enclosure:

Comments.

GAO DRAFT REPORT: "UNITED STATES DEPENDENCE ON NON-FUEL
MINERAL IMPORTS: IMPLICATIONS AND POLICY ALTERNATIVES"

The above-mentioned document was reviewed by the Bureau of Economic and Business Affairs, Office of International Commodities, and was found to be a straight-forward and dispassionate discussion and analysis of an often emotionally charged issue.

In responding to the GAO recommendations on page 84 of the draft report, it may be stated:

A. The Department favors and for some time has been actively pursuing dialogue between producing and consuming countries.

B. The Department favors a variety of financing programs, as suggested, to support diversification of LDC economies.

C. Lowering trade barriers to processed materials (as contrasted with ores and other unprocessed materials) remains a major action which the U.S. could take in return for acceptable understandings on access to resources. We agree with the importance of the concerns expressed: impact on U.S. employment, the need for retraining, and balance of payment considerations.

D. We are working with other consuming countries, most notably through OECD and the IEA, and through coordination of consumer positions at various commodity conferences, to develop common responses to the actions of producing countries. There is relatively free exchange of information on research and developments, substitution, and conservation, and

consideration is being given to the question of establishing economic stockpiles.

In addition to these general comments, we would like to suggest the following modifications, some of a relatively minor nature, which we believe would contribute to the accuracy of the information in the report.

[See GAO note 2.]

- GAO note:
1. Page number references in this appendix may not correspond to pages of this report.
 2. These comments have not been included as changes have been made in the body of the report where appropriate.



THE DEPARTMENT OF THE TREASURY

WASHINGTON, D.C. 20220

ASSISTANT SECRETARY

August 12, 1975

Dear Mr. Lowe:

The following comments are noted in response to the taxation aspects of the GAO draft report "United States Dependence on Non-Fuel Mineral Imports: Implications and Policy Alternatives."

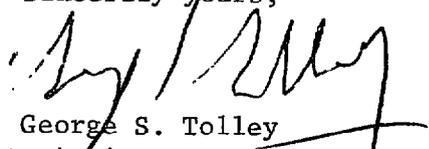
The discussion on pp. 97 of the effect of existing income tax rules on the inducement to U.S. firms to invest in mineral properties abroad fairly portrays the high degree of confusion on the subject which presently handicaps public policy formation. While it is doubtful that precise quantitative estimates can be derived of the net impact of our minerals tax laws and their interaction with foreign tax systems on the size and geographic location of mineral investment, a survey of the issues and qualitative assessment of effects would nevertheless serve a useful purpose in the evaluation of sundry stockpile and "capacity storage" proposals.

If Congress were to act favorably on the recommendation that such a study by the Treasury Department be requested, the following advice might be offered:

- a. The study should be limited to specified sets of minerals and investment locales.
- b. A sufficiently long reporting period should be provided.
- c. The legislative mandate should be worked out in detail by representatives of the Congress and cognizant Executive agencies, including the Treasury Department.

Thank you for giving the Treasury the opportunity to comment on the taxation aspects of your report.

Sincerely yours,


George S. Tolley
Deputy Assistant Secretary

Mr. Victor L. Lowe
Director
General Government Division
General Accounting Office
Washington, D.C. 20548

GAO note: Page number references in this appendix may not correspond to pages of this report.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

August 14, 1975

Mr. Henry Eschwege
Director, Resources and
Economic Development Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

This responds to your July 2, 1975 request for comments on the GAO draft report "United States Dependence on Nonfuel Mineral Imports: Implications and Policy Alternatives".

We have reviewed the report and offer the following comments (enclosure 1) for consideration by GAO. In addition, we have made a number of factual corrections on the enclosed copy of the text (enclosure 2).

Sincerely,

Allan L. Reynolds
Director of Audit and Investigation

Enclosures



Department of the Interior
Comments

on

GAO Draft Report on "United States Dependence on
Nonfuel Mineral Imports: Implications and Policy
Alternatives"

1. We concur wholeheartedly with the recommendation on page 42 to "continue research and development efforts for domestic production and substitution for imports."
2. We disagree with the second recommendation that the "Government support for ongoing pilot projects be contingent upon Government access to industry cost data on both domestic and foreign operations to facilitate an accurate cost benefit analysis." This requirement would be a severe deterrent to the initial stages of research that include cooperative research with industry since industry would most certainly resist the effort to obtain the data. Thus important pilot projects would die away as a result of the lack of industry cooperation and an entire research program would be hampered. In addition, the quantification of many of the benefits has proven far more difficult than the cost side of the calculation. Cost estimation procedures have been well established for many years and particularly with pilot projects are often used because past cost experience with an older technology may not apply to the newer technology.
3. We concur in principle with the recommendation to "be prepared to justify any large-scale pilot project expansion on a cost-benefit basis." This however is a simplification of the many considerations usually present in the justification process. Strategic, legal, environmental, and social factors complicate the process since quantification of benefits and costs is less rigorous for these factors. Thus although an economic cost-benefit basis is an attractive criteria to include in the justification, it can seldom be the only criteria that should be considered.
4. The recommendation on page 84, and subsequent comments on economic stockpiles point out the conflict between an "international" and a "national" oriented economic stockpile solution to the supply problem. Currently, this conflict appears more philosophical than

real. There is no hard evidence to conclusively support either option. The mechanism for operating either type stockpile is complicated and controversial thus one might suspect that the international solution would be more difficult to establish and operate since more diverse interests would be involved. National options offer a wider latitude of control to a country as well as more methods to financially support an economic stockpile. For example, the so-called "Swedish" system of tax incentives could be used to encourage private industry to maintain large inventories of potentially critical raw materials. This type approach would not be available in an international solution. International options however would show more consumer solidarity and thus counter-balances producer leverage better.

5. On page 103, the report incorrectly states that the American Mining Congress has "gone on record as favoring economic stockpiles." The Declaration of Policy of the American Mining Congress was adopted on October 6, 1974 (enclosure 3) and qualifies the use of economic stockpiles to very specific instances.
6. In several instances throughout the report, (pages 30, 31 and 106) there is a tendency to understate the disadvantages of overreliance on imported materials and the resulting dependence of productive capacity on foreign governments' economic and political policies. Since we must deal with the unknown future in discussions about this point, most statements are at best educated guesses. In terms of long-range planning and particularly for those options that require long lead times before they reach fruition, considerations must be included for the "unthinkable" futures. One approach to this can be through the use of probability theory. The Department of Interior's Office of Mineral Policy Development recently completed a study (enclosure 4) on economic stockpiles for selected commodities that incorporated probability theory as a method of considering future events.

In addition, a strong domestic mineral industry gives strength to the bargaining position of the United States that may well make international solutions possible. Without that domestic bargaining strength, other areas of domestic strength must be considered and probably over extended in resolving issues arising because of our dependency on mineral imports. Similarly, a strong domestic mineral industry would enhance the international market structure so it would operate in a more competitive manner.

- GAO note:
1. Page number references in this appendix may not correspond to pages in this report.
 2. Enclosures 2 and 3 have been deleted for brevity.

A DECLARATION OF POLICY
(American Mining Congress 1974/75)

Government Stockpiling

1. The primary safeguard of an adequate supply of minerals is from a healthy U.S. mining industry: an industry that is profitable, supported by its government, free from restrictive regulations and price controls, and aided by tax incentives that will make it possible to take the mining and exploration risks and develop the capital needed to undertake major mineral expansion.

2. A stockpile program, therefore, should be restricted to accumulation of those materials on which the United States is totally or largely dependent for its supplies on foreign sources, as demonstrated by the record. Stockpile objectives should be carefully determined and consistently adhered to, using as a criterion the degree of dependence on imported materials by U.S. industry.

3. If such an economic stockpile is to be established (and specific legislation would be required to authorize such action) every effort should be made to preserve the integrity of the stockpile free from budgetary, political or diplomatic pressures. Releases should be subject to congressional authority and approved only to take care of industrial needs when raw materials are seriously inadequate because of arbitrary actions on the part of foreign producers or their governments. An over-eager response to industry demands for sale of stockpile materials in times of tight supply and rising prices due to normal economic factors will obstruct the natural function of a free market by which higher prices result in stimulating investment in added production.

4. If there is to be an economic stockpile, the American Mining Congress recommends establishment of a Federal Stockpile Corporation, funded by the U. S. government with grants and loan guarantees, and with a completely independent board and management. It should operate in a manner similar to the Federal Reserve Bank, the Export-Import Bank and Federal National Mortgage Association. Directors should represent producers, consumers, labor, and the public, serving for a sufficient term of office to insure that pressure from political, producer, or consumer groups will be minimized.



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Administration
Washington, D.C. 20230

August 22, 1975

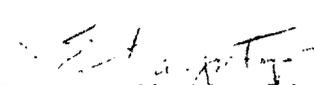
Mr. Victor L. Lowe
Director, General Government Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Lowe:

This is in reply to your letter of July 2, 1975, requesting comments on the draft report entitled "United States Dependence On Non-Fuel Mineral Imports: Implications And Policy Alternatives."

We have reviewed the enclosed comments of the Assistant Secretary for Domestic and International Business and believe they are responsive to the matters discussed in the report.

Sincerely,


Guy W. Chamberlin, Jr.
Acting Assistant Secretary
for Administration

Enclosure





UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Domestic
and International Business
Washington, D.C. 20230

August 18, 1975

Mr. Victor L. Lowe
Director, General Government Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Lowe:

This is in response to your letter of July 2, requesting this Department's views on your draft report entitled "United States Dependence on Non-Fuel Mineral Imports: Implications and Policy Alternatives." In general, we agree with the main thrust of the report's analysis and many of its conclusions regarding the nature and scope of the problem confronting the U.S. The report in large part parallels the results of the CIEP/NSC Special Study on Critical Imported Materials in which this Department participated.

However, we have a number of questions regarding the economic implications of some of the conclusions presented in the report as well as comments on technical issues. I believe that many, if not all, of these questions can be resolved once they are identified and analyzed and I have directed my staff to accept your invitation to discuss the draft report in detail. Mr. Frederic Siesseger of the Bureau of Resources and Trade Assistance will contact Mr. Hunter of your International Division this week.

To acquaint you with our general views, I have enclosed a staff paper commenting on some of the major issues discussed in the report.

We appreciate the opportunity to comment on this report.

Sincerely,

Travis E. Reed
Assistant Secretary for Domestic
and International Business

Enclosure

COPY

MEMORANDUM FOR TRAVIS E. REED
Assistant Secretary for Domestic
and International Business

From: B. Blankenheimer
Director
Office of Import Programs
Thru: Alan Polansky
Deputy Assistant Secretary for
Resources and Trade Assistance

Subject: GAO Report: "United States Dependence on
Non-Fuel Mineral Imports: Implications
and Policy Alternatives"

The report indicates on p. 1 that U.S. policy should "be developed on a case-by-case basis, taking into consideration the uniqueness of individual mineral markets." We fully agree with this analytical approach and believe Chapters 1-6 are a generally well-balanced presentation of the various factors affecting U.S. import dependency in the five commodities studied. However, this approach seems to be relaxed in Chapters 7-8 where analysis focuses on policy implications and alternatives--economic stockpiles, international commodity agreements, and financing by OPIC and Eximbank. While we believe Chapters 7-8 provide a framework for more detailed analysis of alternative policy decisions, the questions posed on p. 105, such as whether stockpiles could stabilize prices, are not analyzed from the standpoint of the five specific commodities. Despite this, the report notes on p. 125 that Congress should "consider broadening stockpile concepts to release material to meet short-term economic . . . emergencies" and clearly establish "the purposes of economic stockpiling." Further analysis would be helpful in determining what is intended in this regard. As it stands, this basic recommendation is, in our view, convoluted; we believe the prior question of whether an economic stockpile is feasible and effective for particular commodities should be further considered.

Moreover, economic stockpiling is only one potential policy alternative that might be considered in dealing

with the problem of assuring secure supplies. In this respect, we note that there is a very brief and, perhaps for this reason, misleading examination of at least one other alternative--international commodity agreements. The basic problem with this discussion is that it fails to recognize important distinctions as between a commodity agreement, an international commodity study group and various kinds of exporter organizations as well as the economic implications of each of them. The report notes on p. 123, for example, that "membership in commodity organizations will not guarantee the U.S. consumer concrete benefits, but neither does it pose a tremendous cost to the consumer." It makes a world of difference as to what is meant by "commodity organizations." Once that is cleared up, there would need to be consideration of the economic implications of the kinds of international activity contemplated. The report indicates on p. 125 that international commodity agreements "may provide a less costly means of assuring access to certain raw materials at reasonable prices." However, there is no specific indication of what these "arrangements" might be or their relative costs in specific commodity situations.

We fully concur with what seems to be a general assessment that an enhanced consumer-producer dialogue can yield mutual benefits. A better flow of information through consumer-producer discussions, such as in the International Lead and Zinc Study Group, can be a significant means of strengthening markets. On the other hand, we believe that examination of international commodity markets on a case-by-case basis shows that the potential for formal agreements involving regulation of trade is extremely limited.

We note numerous statements throughout the text which seem to indicate a bias towards the need for government intervention in commodity markets, but which are not backed by the necessary analytical support. For example, the statement is made on p. 26 that "an improved system of planning and management of the world's resources is needed if future shortages are to be less severe."

We are also puzzled by statements such as made on p. 84 that the U.S. should consider "continuing the dialogue between both producing and consuming nations considering both the legitimate economic aspirations of producing countries for higher mineral prices and the desire of consuming nations to minimize raw material costs and the

loss of real income." Such assertions, at the very least, seem to ignore the role of prices as the primary means to equilibrate world supply/demand and thereby efficiently allocate resources. Rather, there seems to be an implication that prices should be used primarily as a bargaining lever between governments to transfer resources. The latter approach would significantly impair, if not undermine, the functioning of commodity markets. Yet we note the statement on p. 46 that "overall, it appears that market forces will assure a continued flow of minerals to the United States in the foreseeable future."

In general, we believe the report's recommendations as set out on p. 84 and 125-6 depart significantly from what is shown by the analysis presented of the five raw materials. From a broad viewpoint, the report raises a serious question as to the need for Congressional consideration of an economic stockpile for "emergencies" when its principal finding is that the threat of supply interruption, price-gouging or sustained high prices due to producer action, is very limited.

As a further point, we note that the recommendation is made on p. 84 that the U.S. consider "lifting trade barriers against the importation of processed minerals from developing countries which are willing to conclude mutually acceptable mineral access agreements." The U.S., of course, will be pursuing the question of supply-access assurances in the course of the MTNs and in other forums. There is no analysis in the present report, however, of which among the five commodities might be considered, or what the economic tradeoffs might be between tariff reductions and access to supplies in terms of, for example, the effect on U.S. firms and on U.S. import dependency. A similar comment, mutatis mutandis, might be made regarding the recommendation on p. 84 that consideration be given to a "common economic stockpile" of consuming nations.

With regard to the recommendation concerning Eximbank on p. 93, we question whether export financing of capital equipment is either necessary or sufficient to determine the direction of trade in products from many mineral projects. To discriminate against projects not involving U.S. purchase contracts could penalize U.S. equipment suppliers without accompanying benefits. Nevertheless, we recognize that in selected cases there may be strong justification for Eximbank extending preferential terms for projects

involving raw material supplies for U.S. industry. We might point out, however, that Eximbank lending to large domestic corporations which are, in many cases, involved in foreign resource projects, has encountered Congressional criticism on the grounds that these firms have ample access to credit and government assistance is not necessary. We would also note that there are significant legislative obstacles to expansion of the OPIC program for foreign mining projects.

GAO note: Page numbers in this appendix may not correspond to pages of the final report.

**OVERSEAS
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CORPORATION**

1129 20th Street, N.W.
Washington, D.C. 20527
Telex-OPIC Wsh 89-2310



Office of the President

22 AUG 1975

Mr. J. K. Fasick
Director, International Division
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. Fasick:

In response to your letter to Mr. Mays of July 2, 1975 the OPIC officers most directly concerned have reviewed your draft report, "United States Dependence on Non-Fuel Mineral Imports: Implications and Policy Alternatives." The statements about OPIC have our approval.

We agree with the statement on page 91 that "an evaluation of the OPIC programs may be in order to determine if it could play a larger role in promoting international mineral development." We agree further with the statement on page 99 that "the programs of the Overseas Private Investment Corporation and the Export-Import Bank have encouraged this trend and could assume a more dynamic role in promoting mineral diversification" should Congress wish OPIC to undertake this course of action.

Thank you for giving us an opportunity to comment on your draft.

Sincerely yours,

David Gregg III
Executive Vice President

P.S.: Attached is a copy of a letter reflecting some suggested clarifications made by our Deputy General Counsel.

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Washington, D.C. 20527
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Office of the President

22 AUG 1975

Mr. J. K. Fasick
Director, International Division
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. Fasick:

Regarding the draft report, "United States Dependence on Non-Fuel Mineral Imports: Implications and Policy Alternatives," the OPIC Deputy General Counsel, Cecil Hunt, has made the following comments on the captioned GAO report:

(1) The report should be revised to make it clear that the U.S. ownership requirement applies to the investing company that receives insurance and not to the project operating company in which the investment is made. This appears to be correctly understood, although not explicit, in the discussion at pp. 88-90. The recommendations at p. 100, however, incorrectly conclude that amended legislation would be required for "insuring projects which are less than 50 percent owned by U.S. citizens." Neither statute nor OPIC policy prescribes a minimum percentage of U.S. ownership of a project to qualify for insurance coverage. A possible source of confusion is the complex structure, like that cited at page 89, in which a joint venture company formed by U.S. and foreign partners as a conduit for mining project investment may not meet the statutory definition of eligible investor and OPIC may be unable to issue coverage directly to the U.S. participants because interposition of the holding company prevents adequate protection of OPIC subrogation rights.

(2) The draft report implies at the bottom of page 89 that a 1972 ruling by OPIC's General Counsel is the basis for regarding the statutory term "substantially beneficially owned" as requiring

Mr. J. K. Fasick

majority U.S. ownership. In fact, this is the interpretation given this phrase by AID and other prior operators of these programs, and it had become part of the legislative history of the OPIC authority.

(3) It could be useful for the GAO report, in connection with its proposal that eligibility be extended to investments by presently ineligible companies, to call attention to section 234(a)(2) of the Foreign Assistance Act of 1961, as amended, (22 USC 2134(a)(2)). This section permits OPIC to extend coverage to an otherwise ineligible investor in proportion to the participation by eligible investors in the total project financing if there are arrangements for multilateral risk sharing. An adaptation of this to the concerns expressed in the GAO report might be to permit coverage proportionate to the amount of product to be returned to the U.S., without regard to the percentage of U.S. investment ownership of the company making the investment.

We also note an incorrect designation of OPIC in the abbreviations list.

Should you have any questions concerning Mr. Hunt's comments would you please have someone get in touch with him directly.

Sincerely,



David Gregg III
Executive Vice President

GAO note: Page number references in this appendix may not correspond to pages of this report.



PRESIDENT
AND
CHAIRMAN

EXPORT-IMPORT BANK OF THE UNITED STATES

WASHINGTON, D.C. 20571

August 29, 1975

CABLE ADDRESS "EXIMBANK"
TELEX 89-461

Dear Mr. Fasick:

We appreciated receiving a preliminary copy of GAO's report, "United States Dependence on Non-Fuel Mineral Imports: Implications and Policy Alternatives." In general, we concur in the study's conclusions and recommendations, as our own observations and views have progressed along similar lines.

We share GAO's view that Eximbank should give special emphasis to resource development projects which will increase the world supply of mineral resources. Eximbank is already playing a significant role in supporting U.S. exports of mining and other equipment for resource development, thereby facilitating investment in mineral development projects, and will further expand its efforts. In fact, in carrying out its mandate to foster exports in general, I consider this to be one of the Bank's principal objectives over the next decade.

Resource projects achieve three objectives: they increase U.S. exports of mining and processing equipment, thereby stimulating U.S. production, increasing domestic employment, and contributing to our trade balance; they contribute to the economic growth and economic well-being of the developing countries; and they make additional supplies of needed raw materials available to the world market.

The level of required investment in resource development over the next five years is enormous. Continuing inflation and the necessity of developing lower quality energy resources and ore bodies have substantially increased capacity and capital requirements. Adequate and sustained investment is a key factor in assuring adequate supplies at reasonable prices. Export credits are one instrument which has been used, and could increasingly be used, to help mobilize the required capital, while facilitating the use of U.S. equipment and technology in developing needed resources.

To be able to play a greater role in resource development, while still fulfilling our mandate to foster exports, Eximbank's

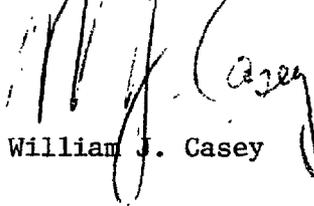
resources in terms of Congressional lending authority and annual budget limits within that authority will probably have to be increased.

We suggest that the section dealing with Eximbank, pages 91-94 of the draft report, be expanded to better reflect the Bank's potential in resource development over the next decade and the need for commensurate lending authority and that these issues be included under "Matters for Consideration by the Congress."

We note that the draft report uses Eximbank data as of 31 May 1974. We are preparing an updated table through the end of FY 1975 to replace the one on page 129.

Please let us know if we can be of additional assistance.

Sincerely,

A handwritten signature in dark ink, appearing to read 'W. J. Casey', is written over the typed name. The signature is fluid and cursive.

William J. Casey

Mr. J. K. Fasick
Director, International Division
United States General Accounting Office
Washington, D.C. 20548

GAO note: Page number references in this appendix may not correspond to pages of this report.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

10 22 75

Mr. Victor L. Lowe
Director, General Government
Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Lowe:

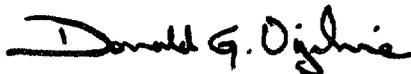
I would like to thank you for the opportunity to respond to the draft GAO study, "United States Dependence on Non-Fuel Mineral Imports: Implications and Policy Alternatives." The study evidences careful research and clarifies a number of aspects of the likely future mineral situation as it may affect the United States.

We concur in the general conclusion of the first six chapters of your study that, although isolated problems do exist, the long-term U.S. mineral acquisition problem is not critical. This general conclusion follows from the observations made in your study:

- the potential for extended supply disruption is remote, in part because suppliers have, in the past, been reliable despite political differences with the U.S.;
- substitution and recycling could have an impact in the long run;
- the U.S. economy can absorb price increases without serious economic dislocation;
- deep seabed mining should increase supplies of at least four important minerals;
- recent shortages were due to insufficient processing capacity caused by depressed mineral prices rather than physical exhaustion; and,
- known reserves of most minerals are increasing with time.

Given these conclusions, we believe that there is some question as to whether the United States Government should undertake special activities to increase future U.S. supplies through the Export-Import Bank and the Overseas Private Investment Corporation and by establishing economic stockpiles. Thus, as the report indicates, these matters deserve further consideration before any action is taken.

Sincerely,

A handwritten signature in black ink that reads "Donald G. Ogilvie". The signature is written in a cursive style with a prominent horizontal stroke at the beginning.

Donald G. Ogilvie
Associate Director

PRINCIPAL OFFICIALS
RESPONSIBLE FOR ACTIVITIES
DISCUSSED IN THIS REPORT

Tenure of office
From To

DEPARTMENT OF STATE

SECRETARY OF STATE:

Henry A. Kissinger	Sept. 1973	Present
William P. Rogers	Jan. 1969	Sept. 1973

DEPARTMENT OF THE INTERIOR

SECRETARY OF THE INTERIOR:

Thomas S. Kleppe	Oct. 1975	Present
Kent Frizzell (acting)	July 1975	Oct. 1975
Stanley K. Hathaway	June 1975	July 1975
Kent Frizzell (acting)	May 1975	June 1975
Rogers C. B. Morton	Jan. 1971	May 1975

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AND MINERALS:

Jack W. Carlson	Aug. 1974	Present
Charles K. Mallory III (acting)	Apr. 1974	Aug. 1974
Stephen Wakefield	Mar. 1973	Apr. 1974

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SECRETARY OF COMMERCE:

Rogers C. B. Morton	May 1975	Present
John K. Tabor (acting)	Mar. 1975	May 1975
Frederick B. Dent	Feb. 1973	Mar. 1975

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George P. Shultz	Jan. 1970	May 1974

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Roy L. Ash	Feb. 1973	Feb. 1975
Casper W. Weinburger	June 1972	Feb. 1973

OVERSEAS PRIVATE INVESTMENT
CORPORATION

PRESIDENT AND CHIEF EXECUTIVE OFFICER:

Marshall T. Mays	Sept. 1973	Present
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EXPORT-IMPORT BANK OF THE UNITED STATES

PRESIDENT AND CHAIRMAN:

William T. Casey	Mar. 1974	Present
Henry Kerns	Mar. 1969	Oct. 1973

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ADMINISTRATOR OF GENERAL SERVICES:

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Arthur F. Sampson	June 1973	Oct. 1975
Robert L. Kunzig	Mar. 1969	June 1973

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