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United States General Accounting Office
Washington, D.C. 20548

FOR RELEASE ON DELIVERY
Expected at 9:45 a.m.
Tuesday, June 12, 1979

Statement of

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before the

Subcommittee on Mines and Mining

House Committee on Interior and Insular Affairs

on

Competitiveness of the U.S. Mining and Mineral Processing Industry

Mr. Chairman and Members of the Subcommittee:

We are pleased to appear before you to discuss our current review of the declining U.S. mining and mineral processing industry and our analysis of the trends, causes and implications. With me today are Joseph Ferri, Assistant Director in our Trade and Finance Group, and Robert Rogers and Donald Ingersoll of our Detroit Regional Office.

Our analysis of many of the common problems and trends in the U.S. mining and mineral processing industry concentrated on four metal industries--zinc, ferroalloys,

copper, and aluminum. In our analysis, we concentrated on the production trends in these industries and on the factors that influence these trends. We did not, however, attempt to quantify specific causes for changes in the trends in these industries, nor did we attempt to determine the quantitative effects that would result from changes in U.S. policies. To a large extent, traditional economic factors such as remoteness of the projects, facilities and equipment needed, and access to capital are important in considering trends in the mineral industry. But, it is clear from the work we have done that Government actions also play a significant role in these trends.

As you know, compared with most nations, the United States is rich in mineral resources. Over the years, domestic smelters and refineries, using foreign ores and concentrates to supplement domestic mine production, have provided U.S. manufacturers with the majority of their mineral needs.

However, in recent years, the domestic mineral industry has declined significantly. For example, despite the start up of a new zinc plant in 1978, the closing of eight plants in the last decade reduced domestic zinc processing capacity by almost 50 percent. During this same period, imports of zinc metal have increased 89 percent.

The United States has always been dependent on foreign sources for the chromium and manganese ores used in making ferroalloys. However, from 1968 to 1977, imports of ferroalloys have changed from ores to processed alloys. In 1968 only 11 percent of the chromium imports and 17 percent of manganese imports were processed alloys. In 1977, the percentage of ferroalloy imports that were processed minerals increased to 33 percent and 51 percent, respectively.

The United States has more copper reserves than any other country in the world. Yet, at the time of our review, only about 65 percent of our domestic production capacity was being used. And, imports of refined copper over the last 5 years have risen from about 8 percent of U.S. consumption to over 19 percent.

The aluminum industry is one of the fastest growing metal industries in the world with predicted growth in demand of 7.5 percent, annually through 1985. However, growth in domestic production capacity is forecast at only 1.4 percent annually. Aluminum metal imports, which account for only 10 percent of U.S. consumption in 1978, are expected to increase to 20 percent by the year 2000.

These trends toward increasing reliance on foreign processed minerals stem primarily from the fact that investment for expanding or modernizing domestic mineral projects has not kept pace with investment in foreign capacity. This is happening because investment in

domestic mineral projects has become less attractive due in part to the impact that Government actions have had on their current and/or expected profitability. Government actions have had particular impact on the economic access to minerals, development and financing costs, labor costs, and energy availability and price.

Economic Access to Minerals

Although the natural distribution of mineral deposits plays the major role in the availability of minerals, Government actions can also greatly limit their availability. In the United States, restrictions on the use of Federal land are hindering exploration and development of domestic mineral resources. In response to growing environmental and conservation concerns, the U.S. Government has withdrawn millions of acres of land from exploration and development and has restricted additional millions of acres under Federal control.

In Alaska and many western states, these land withdrawals have been especially significant. For example, Arizona has been estimated to contain 80 percent of the U.S. copper reserves, but 70 percent of Arizona's land area is federally controlled. In January 1979, 110 million acres of Alaska wilderness were withdrawn from exploration. A study by SRI International estimated that these lands contain substantial mineral deposits that could provide the economy minerals valued at over $900 million, annually.

Mineral exploration and development has also been impeded by administrative delays. The minimum time for obtaining approval of a prospecting permit is estimated to be about 17 months. Approval of a mineral lease and mining plan requires an additional 3 years.

In contrast to U.S. Government restrictions on the use of Federal lands, several countries, in considering their social and economic needs, have given a high priority to developing their mineral resources. And, they have successfully encouraged mineral exploration and mine development through direct government support. South Africa, Argentina, Korea, Brazil, Spain, and the Philippines all provide either direct government financial support or loans and loan guarantees to assist in identifying and developing mineral resources.

Development Costs and Access to Capital

The costs of developing mineral projects is another important consideration in analyzing the decline. Depending on the remoteness of the projects and the facilities and equipment needed development costs can vary significantly. In addition, Government actions are influencing these costs more and more. One of the most significant ways the U.S. Government influences development costs is through mandated environmental protection requirements.

The desirability of protecting the environment is indisputable; however, the mineral industry and various

U.S. Government regulatory agencies disagree considerably about the strictness and timing of the rules, the value of anticipated benefits and the cost and ability of the industry to comply. In a 1970 report to the Congress, the Secretary of Health, Education, and Welfare asserted that 98.8 percent of sulfur dioxide emissions could be feasibly removed from all primary copper, zinc and lead plants in 100 selected areas over a 5-year period for a probable capital cost of $67.6 million. However, from 1974 through 1978 domestic copper producers alone spent an estimated $695 million for sulfur dioxide emission control and, according to a report by Arthur D. Little, Inc., for the Environmental Protection Agency (EPA), copper producers will have to spend an additional $953.5 million through 1987.

Various industry and Government authorities have estimated that the cost of complying with Government regulatory standards such as those of EPA have added 10 to 15 cents to the cost of producing a pound of copper. In some instances, this could mean the difference between a profitable project and a loss.

Other Federal environmental regulations are evolving with similar negative effects on the domestic mining and mineral processing industry. A study by Charles River Associates, Inc., raised the prospect that meeting EPA's proposed new air quality standards for lead could force the closure of as much as 80 percent of the U.S. lead

refining capacity. One Missouri lead smelter estimates its cost of compliance at more than $50 million.

In contrast to U.S. environmental control requirements, other government approaches to regulations are more flexible and, in some instances, less stringent. Other governments are also more willing to support the additional costs of complying with such regulations. To the extent that these other countries have decided their overall national interests are better served by giving high priorities to the costs and practical consequences of environmental standards or where governments provide financial support to defray the costs resulting from environmental controls, the climate for investment in mineral projects within their borders is enhanced.

In addition to the high costs of development, obtaining sufficient capital needed to finance domestic mineral projects has also been difficult. In recent years, the increasingly high debt to equity ratio of many domestic mining and mineral processing firms has hindered their ability to obtain capital for mineral projects. In contrast to U.S. mineral projects which must be financed by private sources, foreign mineral projects are often financed with the assistance of government support either through direct grant, loans, or loan guarantees which facilitate access to capital.

Financing of domestic mineral projects is made even more difficult, according to officials of the U.S. mineral industry, because U.S. antitrust policies discourage domestic firms from forming joint ventures. Companies engaged in capital intensive activities like mining and mineral processing often see joint ventures as a highly desirable way to share costs and risks. However, because of what is considered to be an uncertain and confusing application of antitrust laws in the United States, many officials of the domestic mineral industry stated that they were hesitant to enter into such ventures because they were concerned about the problems created when a U.S. corporation is investigated for or accused of U.S. antitrust violations.

Officials in many other countries, on the other hand, believe that their economies depend less on maintaining competition between domestic firms and more on maintaining competition between domestic and foreign industries. As a result, antitrust laws in these countries are more liberal for industries that are competing internationally and officials are less hesitant to enter into cost and risk sharing arrangements.

These more liberal applications of antitrust laws to foreign commerce, in addition to having Government facilitated access to capital, can give foreign mineral projects an advantage over U.S. projects.

Labor Costs

In addition to access to minerals and the development and financing of the projects, labor costs are another factor that can significantly influence the operating costs of projects. The cost of labor including wages, fringe benefits, and worker health and safety measures can account for as much as one-third of the total production costs in some mineral projects.

The influence of U.S. wage and productivity differentials on the competitiveness of U.S. mineral projects is unclear. Certainly wage rates in the United States are higher than in most countries. And, although comparisons of labor productivity are difficult, some observers believe that U.S. workers are relatively more productive than their foreign counterparts. However, the gaps in wages as well as the gaps in productivity are narrowing.

One area that significantly adds to labor costs in the United States is the increases in costs due to worker health and safety standards set by the Occupational Safety and Health Administration (OSHA). Although the implementation of new production processes to achieve compliance with these standards has in some instances led to increased productivity and lower production costs, for the mineral industry, OSHA standards have generally imposed substantial costs and threatened the continued operation of some domestic facilities.

As in the case of EPA regulations, weighing the benefits of these standards versus their cost is not simple. Considerable uncertainty surrounds the medical need for some of the more stringent requirements of OSHA standards as well as the financial and technical ability of the mineral industry to meet them.

For example, in 1978 OSHA established a maximum standard of 10 micrograms of arsenic per cubic meter of air in the working place atmosphere. While the need to reduce arsenic levels in the workplace atmosphere is obvious, several copper processing companies have disputed the standard as unnecessarily stringent and very costly. One company estimated the cost of compliance to be about $80 million in capital costs at three of its smelters and would add more than $11 million, annually to operating costs. Another company estimated that should a rotational workforce be necessary to meet the standards, the company would have to double its workforce resulting in a 75 percent increase in the cost of smelter operations. A copper smelter which is also the country's only producer of arsenic may have to close because it is unable to meet OSHA's arsenic standard.

In comparison, a copper smelter in Sweden that also processes copper ore with high arsenic content has been granted permission to use less expensive procedures such as protective clothing and respirators to protect its

workers from arsenic exposure. The Swedish Government has also given the firm $13 million for processing equipment that would reduce arsenic emissions.

Generally, the approach in other countries when considering their social and economic needs, is to give a higher priority to the benefits of continued operation of the facility than to the enforcement of strict standards. Also, while OSHA prefers engineering controls, other countries permit the less costly use of protective clothing, respirators, and other such methods to protect worker health and safety.

Efforts to assure the health and safety of workers in the United States, while helping to improve some worker conditions, are adding significant costs to the processing of minerals and making investment in domestic mineral projects less attractive than they otherwise would be.

Energy Availability and Price

The transformation of ores into metal requires large quantities of energy. Before building a mineral processing facility, the availability of energy must be assured. The cost of energy can also be a factor, but it is a secondary consideration to availability. However, existing energy sources in the United States are insufficient to meet growing demands. And, according to representatives of the utility industry and the Department of Energy, increasing regulatory delays and related capital costs have limited construction of new or replacement power plants.

As a result of these uncertainties concerning energy availability, mineral industry officials believe that future expansion of domestic mineral processing capacity is less likely especially if other countries can assure sufficient power availability. A few countries have a natural advantage over the United States in providing energy. In other instances, foreign governments such as Chile, South Africa, Australia, South Korea, and Sweden are giving a high priority to securing sufficient energy for their industrial expansion including an expanding mineral industry.

Other Government Actions

In addition to the cost factors discussed above, several other U.S. and foreign government actions are affecting the profitability and competitiveness of domestic mineral projects. Tax laws, price controls, stockpile sales, tariffs as well as foreign government restrictions on mineral ore exports have all tended to influence U.S. mineral projects.

We have, up to this point, spoken about the ways Government actions contribute to problems in the mineral industry. Now, we would like to discuss some of the implications.

Implication of Our Increasing Reliance on Foreign Minerals

The decline of U.S. mining and mineral processing industry has resulted in lost jobs and job opportunities, has adversely affected our balance of trade, and has increased concerns about our vulnerability to mineral supply interruptions.

The closing of individual mines and/or plants may only directly affect the jobs of a few hundred people in a small geographic area, but the impact on that region can be quite significant. For example, in Ajo, Arizona, a copper mining community, retail sales declined 40 percent after most of the 1,200 local mine and smelter workers were laid off in August 1977. In Michigan's upper peninsula 1,600 copper miners were laid off and the already high unemployment rate in the affected area rose from 10.1 to 22.1 percent.

While the total number of unemployed workers related to the mineral industry cannot be readily determined, various reports indicate that over 18,000 workers directly employed in the mining and/or primary processing of zinc, copper, and ferroalloys have lost their jobs due to plant closing or curtailments of production. A study of the U.S. copper industry conducted by Arthur D. Little Company for the Department of Commerce estimated that compliance with Federal environmental regulations will result in 36 percent of the industry's potential employment or 31,000 full-time jobs being lost by 1987.

In 1978, the United States incurred a deficit trade balance of $34 billion. Though many factors--particularly oil imports--contribute to the deficit, part of it can be attributed to nonfuel minerals whose deficit in 1978 was about $10.6 billion.

Mineral imports have contributed to the deficit in two ways. The most obvious way is that mineral imports have been increasing faster than exports. More significantly, however, is the growing value added impact as imports change from lower value ores and concentrates to higher value processed minerals or metals. From 1972 through 1978 imports of raw materials of mineral origin rose from $2 to $3 billion but processed minerals jumped from $7 billion in 1972 to $19 billion in 1978.

As the trend towards increasing reliance on foreign processed minerals accelerates, the significance of mineral imports in the balance-of-trade will continue to mount. The Bureau of Mines has projected that mineral imports total about $22 billion in 1978 could exceed $50 billion by the year 2000.

As the United States meets a greater portion of its mineral needs through imports, concerns about vulnerability to supply disruptions increase. In response to this concern, the United States has a long-standing policy of maintaining a national security stockpile of critical and strategic materials. However, as import dependency increases and we shift from importing ores and concentrates to processed minerals, acquiring and maintaining stockpiles could become extremely expensive.

For example, Federal Preparedness Agency (FPA) officials advised us that as the United States increases its use of foreign processed minerals and domestic capacity declines,

the stockpile is being increased and upgraded to assure that processed minerals rather than ores and concentrates will be available in the event they are needed. Hypothetically, if the United States lost its entire ferrochromium and ferromanganese capacities, the ores in the stockpile would have to be upgraded to alloys. This would raise the cost of the stockpile for these two metals by $678 million from $422 million to $1.1 billion. A cost increase of even greater magnitude could be expected for a switch in stockpiles from ores to aluminum metal. Even for metals for which the United States has extensive ore reserves such as zinc and copper, as domestic capacity declined there would be a need to stockpile greater quantities of metals and items which are not now stockpiled may have to be added.

The Need For A National Materials Policy and Planning Process

The Congress enacted the Mining and Minerals Policy Act of 1970, thereby reaffirming its interest in an economically sound domestic mining and mineral processing industry. That general policy expression was prompted by (at least in part) growing concern over the degree to which the nation was becoming dependent on foreign mineral supplies to satisfy domestic needs. Subsequently, the Congress enacted much more specific legislation pertaining to other national priorities and social goals, as with energy, the environment, and land conservation and use. Implementation of the latter

legislation has, it seems clear, largely ignored the 1970 Policy Act and tended to aggravate the circumstances and trends which prompted its adoption.

The General Accounting Office has repeatedly stressed the need for an institutionalized planning and policy process that would help assure the availability of materials needed by American industry. As we pointed out in a recent report, "Learning to Look Ahead: The Need For a National Materials Policy and Planning Process" (EMD-79-30; 4/19/79), our failure to recognize--and make allowances for--the interplay between materials, energy, and the environment may eventually threaten the nation's future industrial health.

This latest report, on the phenomena of process shift, is part of a series of GAO case studies designed to illustrate those interrelationships, and their importance to national policymaking. We believe the facts presented in this report attest to the wisdom of statements made by the President's Materials Policy Commission in 1952:

> "There must be, somewhere, a mechanism for looking at a problem as a whole, for keeping tract of changing situations and the interrelation of policies and programs. This task must be performed by a Federal agency near the top of the administrative structure."

and by the National Commission on Supplies and Shortages in 1976:

> "Some means must be found to integrate the... information produced by departments and agencies into a comprehensive picture of how Government policies combine to affect basic industry, and, beyond that, the broad national interest. Means must also be found to alert high-level decision-makers to the possible consequences of events which separately may be of little concern, but together can foreshadow major problems."

GAO is currently working with the Congress, and other interested parties, to develop legislation which would satisfy the institutional requirements stipulated above and make possible far better trade-off analysis between competing legislative mandates affecting the domestic mining and minerals processing industry. As this committee works to derive a minerals policy for the Nation to follow, we would hope that the matters discussed here today will be given serious thought.