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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548



RESOURCES AND ECONOMIC
DEVELOPMENT DIVISION

089395

November 11, 1975

The Honorable Jack W. Carlson
Assistant Secretary, Energy and
Minerals
Department of the Interior

Dear Mr. Carlson:

In your April 22, 1975, letter to the Comptroller General you outlined major steps which the Department of the Interior has taken with regard to the collection, analysis, and dissemination of information concerning minerals and materials. You also stated that you shared the concerns expressed by the General Accounting Office as to the need for adequate information gathering and analysis on minerals and materials and asked that we provide any suggestions that we may have to help you improve your efforts in this regard.

The General Accounting Office recently completed certain survey work in the minerals area. Within the Department of the Interior, this work was performed primarily at the Bureau of Mines and Geological Survey. As part of this work, we reviewed methods used by these agencies in preparing and reporting estimates of mineral availability and identified certain matters which we wish to bring to your attention.

In our view, the accuracy and validity of certain reports prepared by the Department on minerals can be improved by

- using more current information,
- establishing certain guidelines which should be uniformly followed by those responsible for preparing mineral estimates, and
- implementing certain review procedures to help insure that the reports are accurate and reliable.

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PUBLISHED REPORTS ON RESERVE AND
RESOURCE ESTIMATES CAN BE IMPROVED

Two major annual reports which present information on mineral availability are the Commodity Data Summaries and the Mineral Commodity Summary Tables. The Commodity Data Summaries contains statistics and details on supply and demand estimates for 95 minerals, metals, and fuels. The Mineral Commodity Summary Tables consist of 14 statistical schedules on worldwide mineral availability and usage.

Of the 95 commodities for which statistics were published in the Commodity Data Summaries, 1975, we reviewed the estimates presented by the Department on four minerals--bauxite, copper, fluor spar, and nickel. We discussed the preparation of the estimates with responsible Department officials and reviewed supporting documentation for the estimates. We found that (1) the published estimates were not always based on the most current information available, (2) the Department's specialists had different views as to the information which should be included in the estimates, and (3) errors were not detected in the computation and publication of the estimates.

Estimates were not based on
most current information

Three of the four mineral estimates that we reviewed were not based on the most recent data. Mineral specialists who were responsible for the preparation of the bauxite, copper, and nickel estimates were aware of more recent information, which affected the estimates, but did not use the information in their reported estimates.

For example, the estimate of United States bauxite reserves was reported as 40 million tons. However, prior to compiling the 40 million ton estimate for 1975, the Bureau's specialist had received information which identified a possible additional 15 million tons. The estimates were not revised to include the new information.

The Survey's nickel specialist, we were advised, knew of new resources in Central Africa, but did not update the estimate of 84 million tons. The new resources in Central Africa were estimated at, as a minimum, 4.2 million tons.

The Survey's copper specialist did not publish an estimate of identified world resources during 1974 and 1975. In late 1974, information was available which showed that total identified resources had increased from 344 to 646 million tons during 1972 - 1974. Information had been available since 1973 on the increases from 3 to 22 million tons in Central American deposits.

The mineral specialists told us that their other duties and a lack of time were the reasons for not preparing more current estimates.

Need for reporting guidelines
to aid in preparing estimates

The Bureau's and the Survey's specialists obtain data from numerous sources including (1) visits to mines, (2) professional publications, (3) Bureau and Survey studies, (4) mining company announcements, (5) contacts with State geologists, and (6) other Government documents.

We noted, however, that there were no specific standards to assist or guide the specialists in the preparation of mineral estimates. The mineral specialists use their individual judgment as to (1) the sources of information to use, (2) the methodology and estimating techniques, and (3) reporting format. Different views and opinions on these factors may affect the accuracy and consistency of report estimates on mineral availability. Following are some examples of the different practices we noted that were being followed in preparing estimates.

--The Bureau of Mines' specialists had different interpretations of which resources should be reported as "reserves." The Bureau and Survey define reserves as "That portion of the identified resource from which a usable mineral and energy commodity can be economically and legally extracted at the time of determination." One specialist interpreted reserves as including only those resource deposits currently being mined, whereas the other specialists considered reserves to include all resource deposits being mined and those to be mined in the near future.

--In gathering and utilizing available information, two Bureau specialists obtained and evaluated mining company information from Securities and Exchange Commission public documents; another was aware of this source of information but elected not to use it; and the fourth was not aware that information from this source was available.

We did not evaluate the validity and/or the impact of the divergent practices on the final published reports; however, we believe that the issuance of general guidelines would improve the uniformity and consistency of the Department's published estimates.

Need to review estimates

We believe that there is a need to review the reported estimates and verify the accuracy of the information prior to its publication. For the

four mineral estimates we reviewed, two were not adequately supported and there also were errors in the computations of the total reserves.

Specialists could not
support estimates

Fluorspar reserves for the United States were reported at 17 million tons. However, the documentation in support of this estimate showed 13.9 million tons, or about 18 percent below the reported amount. The commodity specialist was unable to reconcile this discrepancy.

Furthermore, world fluorspar resources were reported at 840 million tons or approximately 26 percent less than the amount shown in the supporting documentation. The estimates that the Survey specialist reported did not include resources of over 300 million tons.

U.S. copper reserves were reported at 90 million tons. There was not adequate documentation to support this estimate and, therefore, the specialist could not reconstruct this amount. The specialist said his procedures in preparing estimates were as follows: (1) review of a 1973 Bureau publication which reported 94 million tons; (2) analyzed professional papers and company annual reports and arrived at an estimate of 82 million tons; and (3) used these two totals to arrive at a 90 million ton estimate. The specialist could not, however, specifically identify how the 90 million ton estimate was derived from the above two totals. We also noted that the estimate of 82 million tons was overstated by about 6 million tons.

Discrepancies in
published estimates

In reviewing the Commodity Data Summaries and the Mineral Commodity Summary Tables, we noted a number of discrepancies. These discrepancies, in our view, indicate the need for certain review procedures prior to publication of mineral resource and/or reserve data. We performed a limited check on the information for about one-half the commodities in the Commodity Data Summaries and found a number of errors including the following.

- The 1975 total world diatomite production was published at 802,000 short tons; however, the sum of the production estimates by geographical area totaled 1,802,000, and
- The 1974 published world reserve estimate of fluorspar was 271,000 short tons; whereas, the source documents showed 271,000,000 short tons.

We discussed these errors with commodity specialists and other Bureau officials involved in compiling and reviewing the data. We were informed that a review of the information is performed by supervisors, at various levels of management; however, an oversight in the review process resulted in these deficiencies not being detected.

In addition, we also reviewed the report on "Comparison of World Cumulative Primary Mineral Demand Forecasts 1973-2000, with World Mineral Reserves Recoverable at U.S. 1973 Prices," published in the Mineral Commodity Summary Tables. We compared reserve data on five minerals with the supporting documentation. For three, the data in the report and the supporting documentation were not in agreement. After bringing these discrepancies to the attention of the responsible Bureau officials, the reported reserves for all 87 minerals were reviewed by the Bureau and additional errors were found.

Examples of the errors found were:

--The table reported reserves of 13 million pounds of columbium, whereas the source documents showed 13 billion pounds.

--The table reported reserves of 1,000 kilograms for gallium, whereas the source documents reported 1 million kilograms.

CONCLUSIONS AND RECOMMENDATIONS

We believe that the matters we noted, in our limited review, raises certain questions as to the accuracy, reliability, and consistency of mineral information that is prepared and disseminated by the Department.

Accordingly, we recommend that certain guidelines be issued to those responsible for preparing mineral estimates within the Department. These guidelines, at a minimum, should emphasize the need for the estimates to show the latest available information; and should include, such pertinent details as sources of information to be used, methodology and estimating techniques, and documentation which should be prepared and retained in support of the published estimates. Further, we recommend that review procedures be established to help insure that the estimates are properly prepared and reported.

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This report has been discussed with responsible officials at the Bureau of Mines and the Geological Survey. They expressed general agreement with our conclusions and recommendations.

We would appreciate being informed of any action you take or plan to take on the matters discussed in this report, and we appreciate the cooperation extended to the GAO representatives during the course of this review.

Sincerely yours,

Frank V. Subalusky

Frank V. Subalusky
Assistant Director