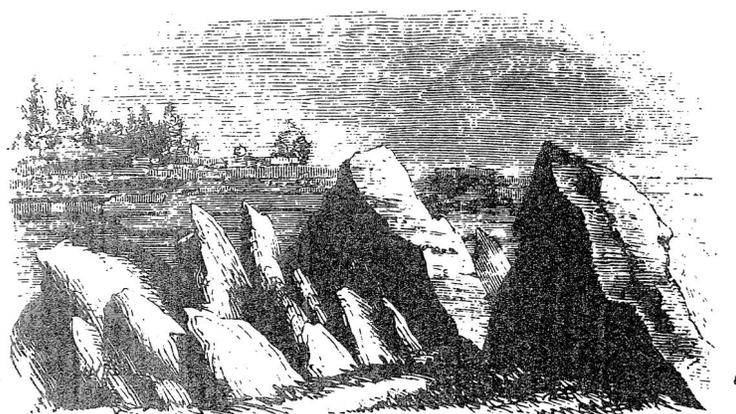


State of California
Department of Conservation
MINING AND GEOLOGY BOARD

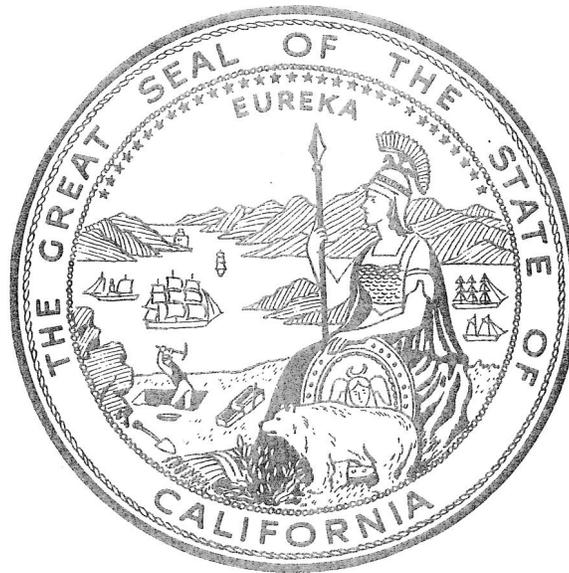
ANNUAL REPORT

1982



LIMESTONE AND TRAP DYKE NEAR SONORA.

a. Superficial detritus. *b.* Trap dyke. *c.* Limestone.



STATE OF CALIFORNIA
EDMUND G. BROWN JR.
GOVERNOR

THE RESOURCES AGENCY
HUEY D. JOHNSON
SECRETARY FOR RESOURCES

DEPARTMENT OF CONSERVATION
JAN DENTON
DIRECTOR

DIVISION OF MINES AND GEOLOGY
JAMES F. DAVIS
STATE GEOLOGIST

State of California
MINING AND GEOLOGY BOARD

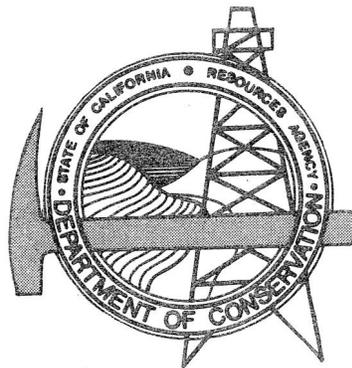
ANNUAL REPORT
1982

BOARD MEMBERS:

Tito Patri-Chairman
James A. Anderson-Vice Chairman

George Brogan
Alcides S. Freitas
John J. Heck
Robert Matthews
Carol Stadum
Kenneth Topping

610 Bercut Drive
Sacramento, CA 95814



ABSTRACT

The State Mining and Geology Board has policy responsibilities for the implementation of California's Surface Mining and Reclamation Act (SMARA). The Board took a number of actions addressing the Act's mineral resource conservation and mined lands reclamation objectives during the 1981-82 fiscal year.

The Board designated regionally significant sand and gravel deposits in the western Ventura County and Simi Valley regions, and initiated the process in the Orange County, San Gabriel Valley, and San Diego County regions.

A pilot report classifying mineral resources in the Mother Lode mineral belt, the first project to be completed as part of the new nonurban classification program, was evaluated with local planners by the Board. Additionally, two new petitions for classifying threatened mineral deposits were accepted, and a completed classification report on an important limestone deposit was adopted and transmitted by the Board to Monterey County.

Policy on lead agency response to the transmittal of classification-designation information was reviewed by the Board because of concerns that flexibility be provided to both the State and local government in dealing with a region-by-region mineral inventory program. The Board determined that an amendment to the Act to clarify this issue should be sought.

The Board has reviewed and certified 78 lead agency surface mining ordinances and is actively working with each remaining lead agency without a certified ordinance to achieve conformance with the Act and State policy.

The Board implemented its policy responsibilities regarding geologic hazards by developing a legislative proposal for a landslide hazard mapping program, and by working with the Department of Education toward the development and inclusion of geologic curriculum in the public schools.

The Board also recommends that: (1) information on California's potential for strategic mineral resources be developed; (2) the potential for thematic mapping and other remote sensing technologies be investigated; (3) more explicit guidelines for use of mineral information by local government be developed; (4) a landslide hazard identification mapping program be developed within the Department of Conservation; (5) SMARA be amended to clarify lead agency response to the transmittal of mineral information and the kind of mineral information to be recognized by lead agencies in their general plans; and (6) that additional funding to accomplish the work program authorized by SB 1300 be sought.

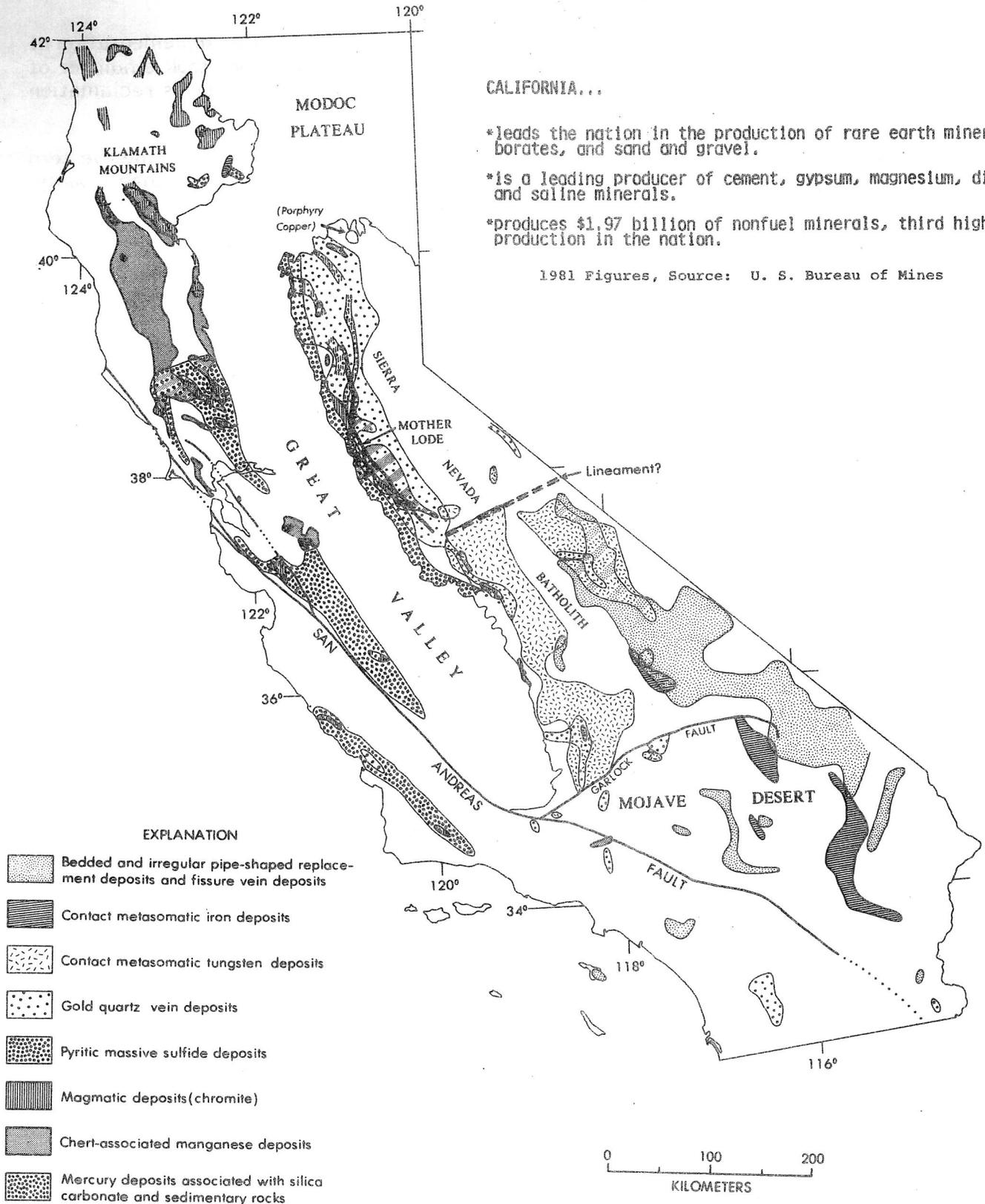
ACKNOWLEDGEMENT

THE STATE MINING AND GEOLOGY BOARD WOULD LIKE TO
ACKNOWLEDGE THE CONTRIBUTIONS TO THE STATE OF
CALIFORNIA DURING THE 1981-82 FISCAL YEAR OF
BING YEN, PAST MEMBER OF THE BOARD.

TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
MINERAL POTENTIAL AND MINING FACTS.....	iv
Part	
I. INTRODUCTION.....	1
II. MAJOR BOARD ACTIONS	
A. Mineral Resource Conservation.....	3
B. Mined Lands Reclamation.....	10
C. Geohazards.....	14
III. RECOMMENDATIONS FOR NEEDED EARTH SCIENCE RESEARCH	
A. Mineral Resource Conservation.....	17
B. Mapping of Slope Instability Hazards is Needed to Reduce the Loss of Life and Property Damage Caused by Uninformed Land-Use Decisions in Areas Prone to Such Hazards.....	20
C. Geologic Curriculum Needed in Public Schools...	21
IV. RECOMMENDATIONS TO THE LEGISLATURE REGARDING THE SURFACE MINING AND RECLAMATION ACT	
A. Additional Support is Required to Accomplish the Work Program Authorized by Senate Bill 1300 (Nejedly).....	23
B. Clarification of the Act.....	23

MINERAL POTENTIAL AND MINING FACTS



Generalized distribution of metallic mineral deposit types in California. Reprinted from "A Lithologic-Tectonic Framework for the Metallogenic Provinces of California," John P. Albers, *Economic Geology*, Vol. 76, No. 4 (June-July 1981).

Part I.

INTRODUCTION

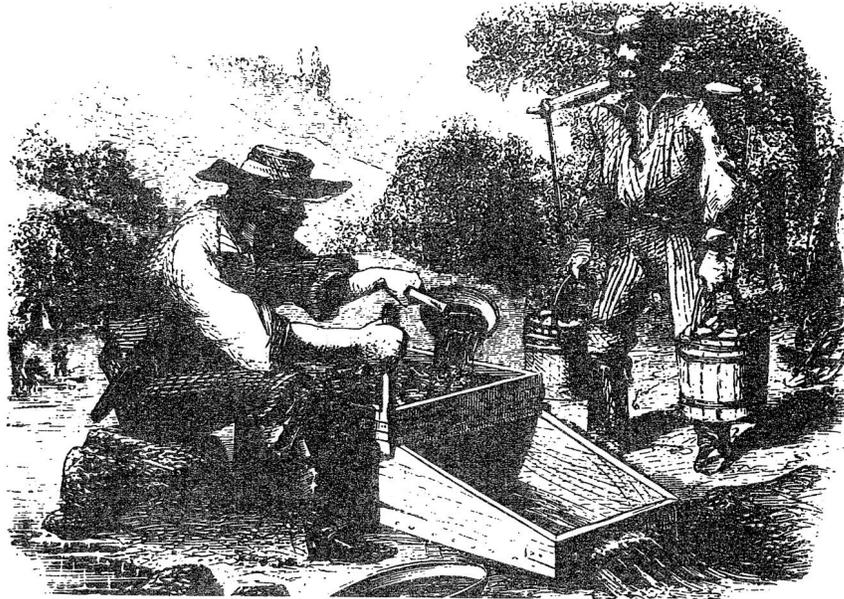
We herein present the highlights of the Mining and Geology Board's activities during the past year, particularly in implementing the Surface Mining and Reclamation Act of 1975 (SMARA) and the Alquist-Priolo Special Studies Zones Act of 1972.

This report combines the Board's report to the Legislature on actions taken during the preceding fiscal year, pursuant to SMARA, and a report to the Governor and the Legislature on needed earthscience research (Sections 2717 and 674 of the Public Resources Code).

Part II.

MAJOR BOARD ACTIONS

The Mining and Geology Board herein submits its Annual Report on actions taken during the 1981-82 fiscal year.



A. Mineral Resource Conservation

1. Introduction

The continued availability of mineral resources that are critical to California's economy and the reclamation of mined lands are the twin and interrelated objectives of the Surface Mining and Reclamation Act of 1975 (SMARA). These objectives are achieved through land-use planning and regulatory programs administered by local government in cooperation with the State.

The Act's mineral resource conservation objective is achieved through a mineral inventory and economic assessment process termed "classification-designation." Information on the location of important mineral deposits is developed by the Department of Conservation's Division of Mines and Geology through the process of mineral land classification. This information is used by the Mining and Geology Board in designating those deposits that are of economic significance to a region, the State, or the nation. Local government uses this information in developing mineral resource management policies and in making land-use decisions to ensure the conservation and development of these resources.

During the past year, the Board took a number of actions to achieve these objectives. These actions included completion of designation in the western Ventura County and Simi Valley regions, and initiation of this process in the Orange County-Temescal Valley, San Gabriel Valley, and San Diego County

regions. In addition, a number of classification reports were reviewed by the Board and transmitted to affected lead agencies. These reports were initiated in response to petitions as well as being developed as the result of the Division's ongoing classification programs.

2. Designation of mineral resources in urban areas of the State.

a. Sand and gravel deposits in Western Ventura County and Simi Valley regions designated as regionally significant.

The Mining and Geology Board's second and third designations, in the western Ventura County and Simi Valley regions, were completed in January 1982. These actions followed a public hearing held in November 1981.

The Division of Mines and Geology estimated that at current rates of consumption, existing permitted reserves of construction aggregate in western Ventura County would be depleted in 13 years. While the Simi Valley region now has an excess of aggregate to meet its 50-year needs, exportation of this material to adjacent aggregate-deficient regions, such as western Ventura County and the San Fernando Valley, could deplete this surplus.

Exportation of aggregate from areas having a surplus may result in higher construction costs to the consumer as well as increased environmental impacts in areas with insufficient aggregate resources. Aggregate, being a high volume, low unit cost commodity, is transportation sensitive. Its delivered price increases with increased distance to the delivery site. Adverse environmental impacts are also associated with the greater use of trucks necessitated by longer haul distances--road damage; traffic safety; fuel consumption; and noise, dust, and air pollution.

Recognizing these facts as well as the need to initiate the local planning process, under SMARA, to manage these mineral resources, the Board transmitted the completed designation, in June 1982, to affected local lead agencies.

b. Designation process for sand and gravel deposits in the Orange County-Temescal Valley and San Gabriel Valley regions initiated.

Reports by the Division of Mines and Geology identifying sand and gravel deposits in the Orange County-Temescal Valley region and in the San Gabriel Valley region were accepted by the Mining and Geology Board in May 1981 and in January 1982, respectively. These reports provide the factual basis for considering designation in these two regions.

Besides identifying economically important sand and gravel deposits in these regions, the Division also identified those deposits that were still available, not built over, as future sources of construction aggregate.

In addition, the Division estimated that existing permitted reserves of sand and gravel in both regions would be depleted in less than 20 years. However, sufficient nonpermitted resources to supply each region's 50-year needs do exist.

These facts, plus other land-use issues affecting mineral resource availability--urban encroachment, open space, and water conservation--were considered by the Board at a January 1982 workshop. The workshop was attended by local planners and representatives from environmental organizations and the mining industry.

Following the workshop, the designation process was initiated for these two regions.

c. Designation of sand and gravel deposits in western San Diego County considered at Board-sponsored workshop.

A report classifying construction-quality sand and gravel resources in the San Diego metropolitan area was the topic of a July 1982 workshop hosted by the Mining and Geology Board. This report, prepared by the Division of Mines and Geology, indicated that if current trends continue western San Diego County would be facing a shortfall of 330 million tons of construction-quality aggregate within the next 50 years.

While approximately 110 square miles of the study area have been identified as containing sand and gravel deposits that are available to meet the County's long-term needs, rapidly expanding urbanization and uninformed land-use decisions could result in these areas being closed to future mining. Eliminating portions of these deposits as future sources of supply by urbanization serves to increase the region's aggregate resource deficit.

Prior to the workshop, the Board toured these areas with local planners, concerned citizens, and mining industry representatives. The effects of the preservation of agricultural lands and urban encroachment on the future availability of mineral resources were discussed.

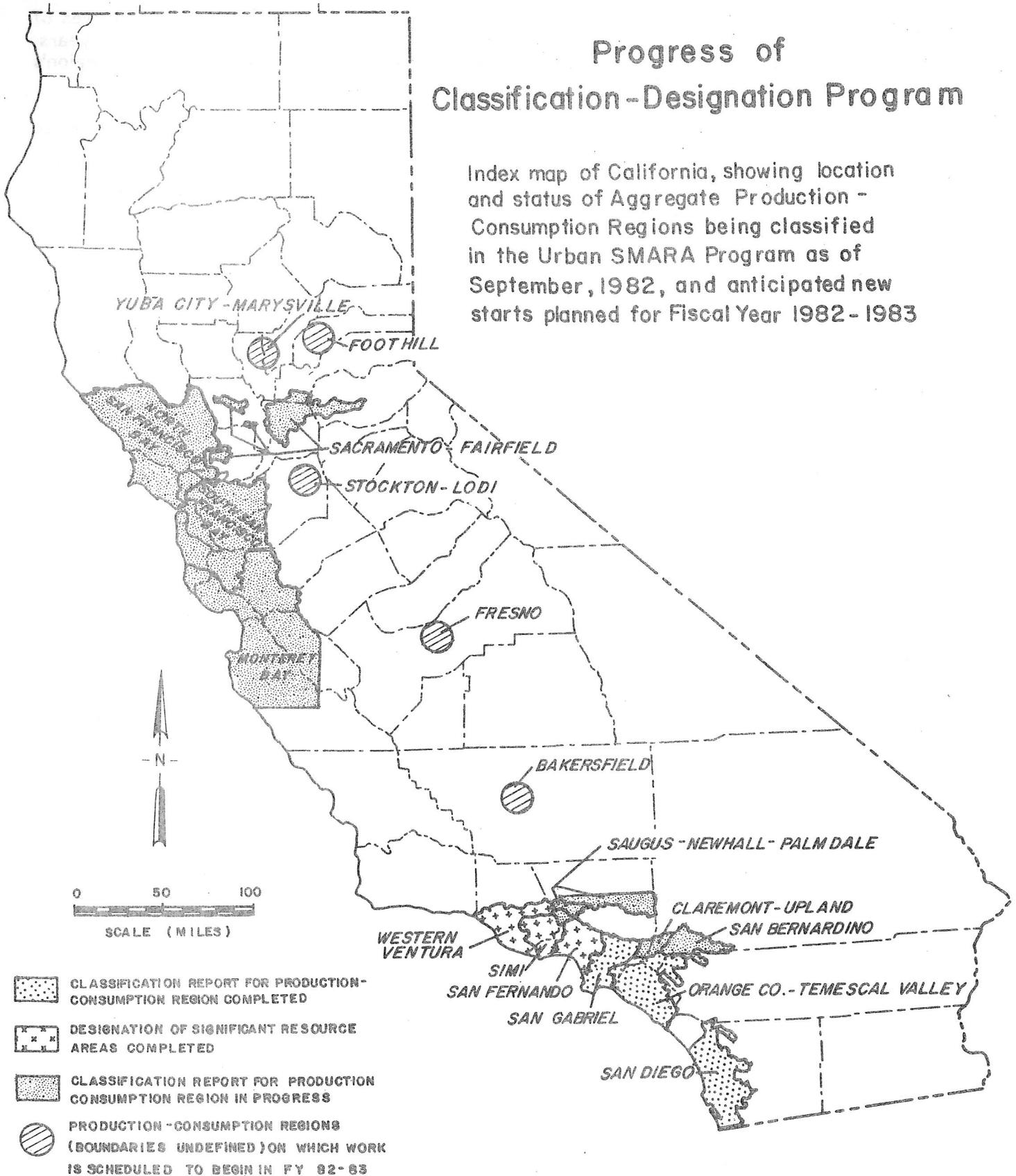
Following public testimony, presentations by Department staff, and the Board's own review, the Board voted unanimously to accept the classification report and to initiate the designation process in this region.

3. Classification of mineral resource areas in nonurban regions of the State.

The initial focus of SMARA's classification-designation process was on urban areas of the State. However, the Mining and Geology Board has long recognized the need to ensure the future availability of mineral resources in nonurban areas of the State as well. A 1980 amendment to SMARA provides for such a program within the Department of Conservation's Division of Mines and Geology.

Progress of Classification-Designation Program

Index map of California, showing location and status of Aggregate Production - Consumption Regions being classified in the Urban SMARA Program as of September, 1982, and anticipated new starts planned for Fiscal Year 1982 - 1983



In developing priorities for this program, California's 100 million acres were divided into major geographical regions. These regions were evaluated for mineral importance and for possible land-use conflicts that could preclude mineral development in the future. Two regions, the Sierra Nevada Foothills and the California Desert Conservation Area (CDCA), were selected as top priority areas for classification--the Sierra Nevada Foothills because of recent urbanization trends within the region and the CDCA because of federal land evaluations being made in conjunction with the implementation of federal land-use plans for the desert.

a. Pilot report classifying mineral resources of the Mother Lode mineral belt, in El Dorado and Amador Counties, reviewed by the Board.

The Placerville Map Sheet (USGS 15-minute quadrangle), which was selected as a pilot project under this new program, was submitted to the Board for review in March 1982. This map sheet covers a 246 square-mile area in the Sierra Nevada Foothill region. It traverses a highly mineralized area--the Sierra Nevada Foothill Mineralized Belt (gold, copper, chromium)--and is subject to urban expansion.

To ensure that the mineral information presented in the report is in a form usable by local government, the Mining and Geology Board solicited comments from affected lead agencies--El Dorado County, Amador County, and the City of Placerville. These comments are currently being evaluated by the Board.

The Board also recognizes that the usefulness of these reports goes beyond land-use decision making. Because the Division delineates areas of high mineral potential on a regional basis, exploration activity, as well as future mineral development, should be stimulated in these areas.

4. Petitions for classification of threatened mineral deposits processed.

Passage of Senate Bill 1300 in July of 1980 and the subsequent organization of a nonurban classification program within the Division of Mines and Geology provided the funds and staff necessary to enable the Mining and Geology Board to implement its petition process.

The Board, in September of 1981, asked the Division to proceed with the classification of the following deposits:

- Graniterock Company, limestone deposit, Big Sur, Monterey County
- Gladding McBean & Company, shale deposit, Corona, Riverside County
- Pacific Clay Products, Inc., clay deposit, Alberhill, Riverside County

- Riverside Cement Company, kaolinitic sandstone deposit, Trabuco Canyon, Orange County
- Edward Ordway, limestone and dolomite deposit, Placer County

Later in 1982, the Board accepted and forwarded to the State Geologist two additional petitions for classification:

- Placer Service Corporation's San Juan Ridge gold deposit in Nevada County
- Pluess-Staufer, Inc.'s Lucerne Valley limestone deposit in San Bernardino County

5. Classification of Graniterock Company's Pico Blanco limestone deposit accepted and transmitted to Monterey County.

A petition to classify Graniterock Company's Pico Blanco limestone deposit in the Big Sur area of Monterey County was accepted by the Board in September 1981. This action was based on the deposit's meeting certain criteria of significance (value and marketability) as well as the deposit's being threatened by a proposed land-use decision, which was incompatible with SMARA's mineral resource conservation objectives. The threat in this case was the development of a proposed local Coastal Plan for the Big Sur Coast, which precluded consideration of mineral development in the area.

The Division of Mines and Geology subsequently classified this area as containing high-grade (whiting quality) limestone deposits. The Mining and Geology Board transmitted this information to Monterey County and the Coastal Commission in June 1982 to assist in their formulation of the Coastal Plan as well as subsequent land-use decisions related to the deposit.

6. Policy on lead agency response to the transmittal of classification-designation information adopted by the Board.

The Surface Mining and Reclamation Act (SMARA) requires that within 12 months of the receipt of mineral information--classification or designation reports--a lead agency must establish mineral resource management policies to be incorporated into its general plan. If designation follows classification, as it does in the urban classification program, then the lead agency will be required to amend its general plan more than once. This occurs because the mineral information is routinely transmitted to affected lead agencies as it is developed. Such action places an undue administrative burden on local government and may also result in a piecemeal approach to mineral resource planning.

To wait until an entire county is classified, as is required by SMARA, before making this mineral information available would deprive lead agencies of having information necessary to making timely and informed land-use decisions. In an attempt to provide flexibility to both the State and local government in dealing with a region-by-region mineral inventory program, the Mining and Geology Board resolved that, following receipt of classification information when a related designation can be anticipated in

the near future, such classification information may be sent to affected lead agencies for review purposes only. Once completed, the transmittal of designation information would then initiate the 12-month response time required by SMARA. In addition, the Board felt that an amendment to the Act to clarify this issue should be sought.

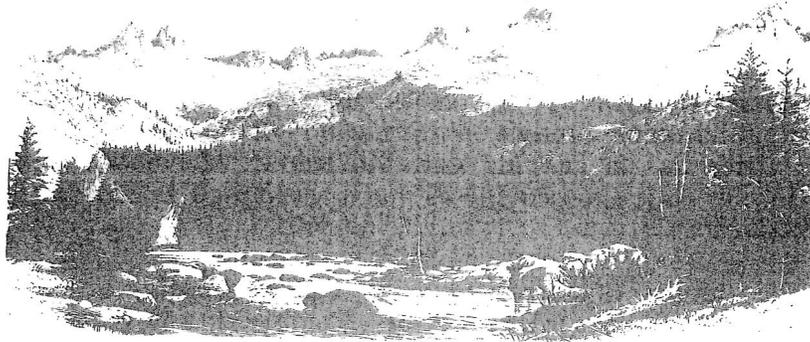
7. The Board serves as a clearinghouse for information on a wide range of subjects related to mineral resource conservation.

The Mining and Geology Board's office in Sacramento receives a number of inquiries, both by telephone and mail, each month from individuals and organizations seeking information on mining and mineral resources in California. In keeping with its public information responsibilities, it is the Board's policy to provide as much assistance as possible in responding to these requests.

The nature of these inquiries varies greatly, although the most common concerns the State's regulatory framework and permitting process for mining projects. The Board maintains general information on these processes and a list of contact persons in other agencies where more complete information can be obtained.

Another important aspect of the Board's public information program involves the use of classification-designation information by local government. For SMARA's mineral resource management program to work, local government must use the mineral information provided by the State.

During the past year, the Board's staff assisted a number of lead agencies--San Benito, San Mateo, Orange, Riverside, San Diego, Ventura, Butte, and Amador Counties--in their mineral resource planning efforts. Mineral information, as well as policy guidance, was provided.



Mined Lands Reclamation

1. Introduction

Since 1930, only 20 percent of California's 257,000 acres of mined lands have been reclaimed. These reclaimed lands are principally depleted sand and gravel deposits in urban areas. Here, high land values impel beneficial post-mining use. However, in other areas of the State, where land values are low, this economic incentive is absent. The Surface Mining and Reclamation Act (SMARA) was passed in 1975 to ensure that all mined lands in California are reclaimed.

The Act provides for a cooperative State and local program to ensure that the environmental impacts of mining are minimized or eliminated and that mined lands are reclaimed to a usable condition. Local lead agencies administer the Act's permit and reclamation plan requirements under surface mining ordinances, which are certified by the State.

2. Local SMARA ordinances reviewed and certified.

Currently, 86 "lead" agencies administer the Act's permit and reclamation plan requirements through surface mining ordinances. Local jurisdictions with active mines are considered to be lead agencies by the Act. Approximately 1500 active mines in California, which in 1981 produced almost \$2 billion in minerals, are regulated under these ordinances.

Recent amendments to SMARA require the Mining and Geology Board to review and certify lead agencies' adopted surface mining ordinances to assure they are consistent with the Act and State policy.

Following an initial review of ordinances submitted for certification, a number of agencies were requested informally to modify their ordinances for consistency with certification criteria established by the Board. Response was positive, with many agencies submitting revised ordinances almost immediately. Recognizing that other agencies would not have a certified ordinance by the November 1, 1981, deadline specified by the Act, the Board adopted a formalized process and officially notified those lead agencies that still had deficient ordinances. To date, the Board has certified 78 lead agency surface mining ordinances.

In situations where a lead agency does not have a certified ordinance, the Act specifies that the Board shall assume full authority for reviewing and approving reclamation plans submitted to the lead agency. This requirement remains in force until such time as the agency's ordinance is certified in accordance with State policy. The Board is actively working with each remaining lead agency without a certified ordinance to achieve conformance.

3. Policy for Surface Mining and Reclamation Practice reviewed and filed in compliance with requirements of the Administrative Procedures Act, AB 1111.

Pursuant to AB 1111, the Mining and Geology Board reviewed its regulations establishing State policy for surface mining and reclamation practices. This review ensures that these regulations meet this Act's (the Administrative Procedures Act) criteria for necessity, clarity and consistency with existing law and that they are adopted under proper authority and referenced.

Based on comments solicited from lead agencies, operators, and interested persons earlier in the year; the Board's own review; and a public hearing held in September 1981, the Board adopted minor changes to its regulations. These changes added references to applicable statutes, as well as clarification to certain definitions.

These changes were submitted to the Office of Administrative Law in February 1982 for incorporation into the Administrative Code.

4. The Board's continuing interest in Cal-Nickel's Gasquet Mountain project reflects its concern that SMARA's reclamation requirements are applied to federal lands in California.

The Mining and Geology Board has been following the progress of a nickel laterite mining project in the Six Rivers National Forest--California Nickel Corporation's Gasquet Mountain Project--since the project's inception.

The Board's interest in this situation is not just with the project itself--though it does represent a significant mining project in an environmentally sensitive area--but more generally in how the requirements of SMARA are being met on federal lands.

In May 1981, the Mining and Geology Board reaffirmed its position that SMARA applies to all lands in California. This position was consistent with the Attorney General's Opinion No. SO 76/14 and with the intent of the Legislature in passing SMARA. The Board's action was taken to ensure that regulations governing surface mining and reclamation practice were applied uniformly throughout the State. The Board also encouraged local "lead" agencies, which implement SMARA, to work cooperatively with appropriate federal agencies to avoid regulatory overlap.

To assist lead agencies--such as Del Norte County, the lead agency for the Cal Nickel Project--in fulfilling their responsibilities for implementing SMARA on federal lands, a Memorandum of Understanding (MOU) was developed under Board auspices and signed in 1979 by the California State Resources Agency, the U.S. Forest Service, and the U.S. Bureau of Land Management.

This memorandum provides for the coordination of mining and reclamation on federal or on combinations of federal and private lands.

To assess how Del Norte County and the U.S. Forest Service are implementing the MOU with regard to the Gasquet Mountain Project, members of the Mining and Geology Board visited the project site in September 1981. The Board met with County planners, U.S. Forest Service personnel, Cal Nickel representatives, and concerned citizens to discuss the project, its environmental impacts, proposed mitigative measures, and how SMARA's reclamation requirements are being applied to the project.

While the County and U.S. Forest Service are coordinating their review and approval of the project's mining phase, it is not clear if this is occurring for the project's exploration phase. The Board remains concerned that SMARA's reclamation requirements be applied to the project's exploration phase--with its extensive road network, drill sites, and test pits--as well as to the project's mining phase. That such requirements be applied is especially important should the project prove to be uneconomical and abandoned.

5. Board considers revision of its reclamation planning guide.

The State's "Guide for the Preparation and Review of Reclamation Plans," prepared under the direction of the Mining and Geology Board, was adopted and incorporated into State policy in 1976. This guide was developed to assist local government and mine operators in complying with SMARA.

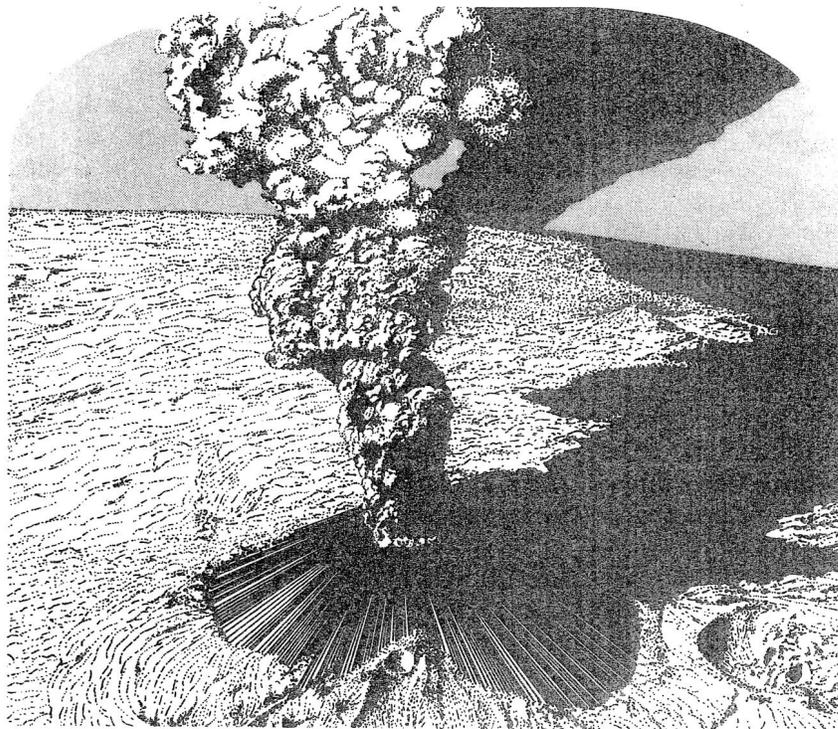
Based upon its experience in overseeing the administration of SMARA since the publication of this guide, the Board asked that the guide be revised by the Division of Mines and Geology's reclamation staff. Comments and suggestions were solicited from lead agencies and mine operators and were used in developing a revised guide.

As a result of the Board's own review and comments received from selected reviewers, a draft of the guide has been completed and will be considered in the 1982-83 fiscal year.

6. Reclamation workplan for the Division of Mines and Geology approved.

A small group of reclamation technologists and planners was organized within the Division of Mines and Geology in 1981 under funding provided by SB 1300. The goals of this program are to: (1) identify successful reclamation technology and ensure its application by means of research, seminars, workshops, and publications; (2) to disseminate information on solutions to site-specific reclamation problems through reclamation plan review, consultations, publications, and problem resolution; and (3) to increase public awareness of mineral resource management.

A five-year workplan to guide these efforts was approved by the Mining and Geology Board in July 1982. The major activities for the reclamation group include a technical assistance program -- reclamation plan review -- and an information gathering and dissemination program -- reclamation planning publications, library of reclamation plans, and compilation of active reclamation sites. Other activities include workshops, reclamation plan competition, and research projects.



C. Geohazards

1. Legislation addressing the identification of unstable slope hazards (AB 2779, Moore) supported.

The problem of unstable slope hazards (landslides, mudslides, debris flows, slumps, soil creep, etc.) has been of long-standing concern to the Mining and Geology Board. This concern was recently underscored by the tragic loss of life and property damage resulting from storm-triggered slides in the San Francisco Bay area.

In April of 1981, the Board's Geohazards Committee, along with the Department of Conservation, hosted a landslide hazards workshop attended by representatives from the Legislature, State and federal geological surveys, local planners, and academia.

Based on suggestions from the workshop, a legislative proposal dealing with unstable slope hazards was developed and approved by the Board at its July 1981 meeting. It was agreed that the most useful purpose future legislation could serve would be to provide support for a statewide mapping program aimed at identifying areas of potential unstable and hazardous slopes.

Legislation introduced early in 1982 by Assemblywoman Gwen Moore, AB 2779, provided a vehicle for pursuing this goal. This bill proposed the establishment of a landslide hazard identification and mapping program within the Department of Conservation's Division of Mines and Geology,

which would provide information and technical advice to local governments to enable them to identify and manage areas subject to landslides and other slope failures. Though AB 2779 failed, the Board will continue to search for alternative means to address this issue.

2. Policy and Criteria of the State Mining and Geology Board with Reference to the Alquist-Priolo Special Studies Zones Act reviewed and filed in conformance with the requirements of the Administrative Procedures Act (AB 1111).

The Mining and Geology Board reviewed, pursuant to AB 1111, its regulations establishing policy for the implementation of the Alquist-Priolo Special Studies Zones Act to ensure that these regulations were necessary, adopted under proper authority, clearly written, consistent with existing law, and properly referenced.

Based on comments solicited from local, state, and federal agencies as well as other interested persons and organizations; the Board's own review; and a public hearing held in September 1981, the Board determined that no substantive changes would be required. Minor changes referencing the regulations to applicable sections of the Public Resources Code were filed with the Office of Administrative Law in February 1982, completing the AB 1111 review process.

Part III.

RECOMMENDATIONS FOR NEEDED EARTHSCIENCE RESEARCH

A. Mineral Resource Conservation

1. An assessment of California's strategic mineral potential and associated economic and regulatory issues is needed to facilitate the development of a policy framework for related land-use decisions on public lands. Without this framework, exploitation of public lands for strategic minerals in the national interest could ignore State and local concerns and shortchange other important resource values.

In the past, the Mining and Geology Board has emphasized the need to develop information on California's potential for strategic minerals. The Board reiterates the importance of this information as well as associated economic and regulatory issues to assist in developing a policy framework for land-use decisions affecting lands in California.

A national interest in obtaining secure sources of strategic minerals, consideration of federal subsidies for the mining of such minerals, and the large amount of highly mineralized public lands in California together may have substantial impact on the State. These factors set the stage for land-use decisions, which could impact the environment and local economics.

Over 45 percent of California is comprised of federally owned or managed lands. Much of this area, in the Sierra Nevada, Klamath Mountains, and California Desert, is highly mineralized and open to mineral entry under the 1872 Mining Law. These areas are used for a number of purposes including grazing, recreation, timber production, watershed, and fisheries, as well as for mineral production.

Present federal laws and regulations permit mining on public lands. Mining on these lands, whether for strategic or other industrially valuable mineral commodities, with certain exceptions, is governed by the 1872 Mining Law. Under this law, the right to mine is obtained by claiming the discovery of a valuable mineral deposit. Mining of certain other minerals on public lands is subject to leasing and royalty payments under the Mineral Leasing Act (coal and salines) and the Mineral Disposal Act (sand, gravel, and clay).

Increased emphasis is being placed at the national level on obtaining secure sources of strategic metals and minerals--for example the President's National Materials and Minerals Program Plan and Report and a recently introduced bill, HR 5540, the Defense Revitalization Act. This emphasis sets the stage for policies and land-use decisions that may impact the long-term management of public lands.

For example, HR 5540 (Blanchard et al) proposes subsidies for mining of strategic and critical metals and minerals. Section 393A(d) of the bill would authorize the federal government to "...extend assistance...to persons engaged in the expansion of the domestic capability and capacity to produce or process critical and strategic metals, minerals, and materials..." This subsidy would encourage the development of marginal or submarginal mineral deposits on both private and public lands over other uses.

Six Rivers National Forest, in California's Klamath Mountains, provides an example of the effects of subsidized mining for strategic minerals, as proposed by HR 5540, on public lands. The Klamath Mountains contain the largest ultramafic rock complex in North America. Ultramafic rocks are host to a number of important mineral commodities including such strategic metals as nickel, cobalt, and chromium. Some of the most highly mineralized ultramafic rocks of the Klamath Mountains occur within the Smith River region of the Six Rivers National Forest. In fact, about 31 percent (201 square miles) of the region's 630 square-mile area is underlain by these rocks. Though 86 square miles of this region have been claimed under the provisions of the 1872 Mining Law, little if any mining of nickel, cobalt, and chromium is now occurring.

The Smith River region, like the rest of the Six Rivers National Forest, is highly valued for its recreational use, timber production, and fisheries. The river and its tributaries have been included in California's Wild and Scenic River Systems in recognition of its unique environmental characteristics.

HR 5540's proposed subsidy of strategic metal mining could allow a now-marginal nickel laterite deposit in the Smith River region, covering a 3000-acre site at Gasquet Mountain, to become economic. Currently, this deposit's announced average grade of .85% nickel is well below the 1.50% average grade mined from similar deposits worldwide.

Construction of a smelter, in conjunction with a mine at this deposit as proposed by the project's operators, would encourage the development of other submarginal deposits (High Plateau Mountains, Elk Camp Ridge, Pine Flat, etc.) in this area. The cumulative impacts from such development could adversely affect a significant part of the region.

In addition, adequate reclamation of public lands disturbed by subsidized mining operations may not occur. The right to mine on public lands is obtained by the act of claiming a discovery of a valuable mineral deposit (1872 Mining Law). This is in contrast to the permitting process required for mining on private lands under California's Surface Mining and Reclamation Act.

California's law requires that a permit and reclamation plan be approved by local government prior to beginning a mining operation. Such approval follows a public hearing.

Federal land managing agencies, such as the U.S. Forest Service and the Bureau of Land Management, do have regulations requiring plans of operation and rehabilitation of mined lands. However, given a national emphasis on strategic metal mining, necessary but costly land treatments may not be required, resulting in environmental degradation and reduction of long-term productivity of public lands.

The situation involving subsidized strategic mineral mining in Six Rivers National Forest could be repeated many times over on public lands in California. Public officials at local, state, and federal levels need factual information on the economic characteristics and potential for strategic minerals in California as a framework for policies and land-use decisions affecting public lands in the State.

The Mining and Geology Board recommends that the Department of Conservation complete the development of a "white paper" on strategic mineral development on public lands in California. This paper's discussion of the potential for strategic minerals on public and private lands in California, as well as associated economic and regulatory issues, should provide the foundation for serious debate in the coming year on the development of California's strategic minerals policy.

2. Recent developments in remote sensing techniques could assist the State in mapping mineral resources and geologic hazards at reduced costs.

The new thematic mapping capabilities of the Landsat D spacecraft may provide data useful to the State in assessing California's mineral potential as well as identifying its geologic hazards. The higher resolution and spectral fidelity of the thematic mapper--specifically in its thermal infrared and hydrothermal bands--used in combination with other remote sensing techniques promises better discrimination between rock units and geologic features than heretofore.

This capability has the potential for increasing the productivity of the Division of Mines and Geology's mineral resource and geologic hazards mapping programs.

The State's current fiscal situation, together with the labor-intensive nature of geologic mapping, makes it imperative that advances in remote sensing technology applicable to geologic mapping be assessed. Accordingly, the Mining and Geology Board recommends that the Department's Division of Mines and Geology investigate the potential that thematic mapping and other remote sensing technologies may have for increasing the productivity of its field geologists.

3. More explicit guidelines needed for local use of the mineral information developed from the classification-designation process.

A number of areas have been classified and designated under SMARA's classification-designation process. It is becoming clear that the second and probably most critical stage of this process--use of this mineral information by local government--needs to be addressed.

The thrust of the classification-designation process is to provide local lead agencies with information on the location and importance of mineral resources to assist in their management of these resources. The policy framework for local management is the General Plan.

Upon receipt of State-supplied mineral information, a lead agency is required by SMARA to "...establish mineral resource management policies to be incorporated into its general plan which will":

- "...recognize mineral information classified by the State Geologist...",
- "...assist in the management of land use which affects areas of statewide and regional significance...", and
- "...emphasize the conservation and development of identified mineral deposits."

As an aid to local government in fulfilling these obligations, the Mining and Geology Board, in 1978, adopted Guidelines for Mineral Resource Management. These Guidelines provide general goals and policies for the management of lands classified as MRZ-2 or designated to be of statewide or of regional significance.

Inquiries from lead agencies receiving mineral information, such as Orange, Los Angeles, and Monterey Counties, indicate a need for more specific guidance. Other agencies, such as Ventura and San Bernardino Counties, are in the process of developing such policies, general plan elements, and implementing procedures from scratch.

In addition, SMARA requires that such policies be reviewed by the Mining and Geology Board before adoption. But beyond its guidelines--which are general and do not provide a model for incorporating the mineral information or policies into the general plan--the Board does not have a standard for such a review.

The Office of Planning and Research has developed a number of model elements for the general plan as part of its local assistance program. These model elements suggest policies and goals for managing various land uses. However, an element addressing minerals has not been developed. It is recommended that development of such a model is the next logical step in ensuring that the mineral information developed by the State is properly used.

B. Mapping of slope instability hazards is needed to reduce the loss of life and property damage caused by uninformed land-use decisions in areas prone to such hazards.

The California Division of Mines and Geology estimated in 1973 that the State would experience almost \$10 billion in landslide damage between 1970 and 2000 if current loss prevention practices remain unchanged. In today's dollars, that estimate equals a potential loss of approximately \$20 billion.

Debris avalanches, debris flows, and associated storm-triggered landslides have caused most of the deaths and much of the structural damage attributed to landsliding in California. In 1978, such slides in the Los Angeles area caused over \$439 million in property damage. More recently in January 1982, storm-triggered slope failures in the San Francisco Bay area resulted in the loss of 28 lives and over \$280 million in damage to homes and commercial and public buildings.

State law pertaining to general plans requires that cities and counties adopt plans and ordinances to avoid or mitigate landslide hazards. Local governments have found it difficult to carry out these responsibilities because of insufficient or unreliable information.

During the 1970's, the Division mapped landslide hazards in cooperation with a number of counties in the San Francisco and Los Angeles areas. This program was curtailed in the late 1970's due to the affects of Proposition 13 on local budgets which supported this program. Currently, the Division has two positions devoted to this program.

Uninformed land-use decisions in areas affected by landslide hazards will continue to set the stage for the tragic loss of life and damage to property such as experienced in 1978 and 1982. In addition, society as a whole, through government supplied disaster relief funds and low interest loans, will continue to subsidize reconstruction in such areas.

Recent legislation (AB 2779, Moore) addressed this problem by proposing a Landslide Hazard Identification Program. Though unsuccessful, this bill would have established a mapping and technical advisory capability within the Department of Conservation's Division of Mines and Geology. This capability would have assisted local government in their land-use planning activities to mitigate landslide hazards in urban and urbanizing areas. The Mining and Geology Board worked closely with the author and the Department in support of this bill.

The Board remains committed to finding alternative means to ensure that such hazards are identified, that the underlying causitive mechanisms are understood, and that this information is made available for local planning purposes.

C. Geologic Curriculum Needed in Public Schools

Californians experience a wide range of problems related to such geologic phenomena as earthquakes and landslides. In addition, the State's economic well-being is founded on its mineral and energy resources, its agricultural soils, and water, all in some way created or affected by geologic processes. Public policies and land-use decisions that do not consider these processes contribute to a wasting or misuse of this endowment as well as exacerbating the property damage and loss of life that often occurs when earthquakes and landslides strike.

In 1973, the Division of Mines and Geology estimated that the cost of such policies and decisions, from 1970 to 2000, would approach \$55 billion. This represents \$110 billion in today's dollars. These costs result primarily from damages caused by earthquakes, flooding, landslides, and loss of mineral resources due to urbanization.

A lack of understanding of the processes and impacts of geologic phenomena common to California, by citizen and public official alike, contributes to this problem. Lack of awareness of geology stems directly from the State's educational policies, which place little or no emphasis on its study in public schools.

The Mining and Geology Board is concerned that geology is now omitted from the educational experiences available to California's students below the college level. Further, the Board recognizes that the State is moving to correct this situation indirectly by placing increased emphasis on science education in the public schools. To assure that geology is also emphasized in the State's evolving policy for science education, the Board is working with the Board of Education's Curriculum Commission to develop a framework for the study of science, which will include geology.

Part IV.

RECOMMENDATIONS TO THE LEGISLATURE REGARDING
THE SURFACE MINING AND RECLAMATION ACT

A. Additional support is required to accomplish the work program authorized by Senate Bill 1300 (Nejedly)

The Act, as amended in 1980, provides \$1.1 million per year to support the State's SMARA program. This amount is not adjusted for inflation.

The impacts of inflation, as well as unanticipated higher operational costs, given the program's static funding level, will reduce its effectiveness over time.

Receipt of new petitions for classification of threatened mineral deposits (San Bernardino, Placer, and Nevada Counties), requests for extension of ongoing regional classification programs (Tuolumne, Amador, El Dorado, Placer, and Fresno Counties), and increased technical assistance engendered by new mining projects, as well as the needs to complete the urban classification program in a timely manner, support continuation of SB 1300's level of program activity.

The Mining and Geology Board is concerned that without some upward adjustment to SB 1300's funding level, the effectiveness of SMARA will be jeopardized.

B. Clarification of the Act

1. To reduce the cost of local compliance, lead agencies should be required to amend their general plans only once, to reflect classification or designation information, upon completion of the process in a particular region.

California's Surface Mining and Reclamation Act of 1975 (SMARA) provides for a mineral inventory and economic assessment process termed "classification-designation" to ensure that the Act's mineral resource conservation objectives are met. Information on the location and importance of mineral deposits is developed by the Division of Mines and Geology through the process of mineral-land classification. This information is then used by the Board in designating those deposits that are of economic significance to a region, the State, or the nation.

A lead agency must respond to the transmittal of mineral information by the Board. SMARA requires that within 12 months of the receipt of such information (classification or designation reports) a lead agency must "...establish mineral resource management policies to be incorporated in its general plan..." that recognize this information and emphasize the conservation and development of identified mineral deposits.

A literal reading of the Act indicates that transmittal of mineral information must wait until an entire county has been classified or designated. Experience has shown, however, that geologic assessments are more practically made on a region-by-region basis, which may or may not include an entire county.

The Board is concerned that classification information, as developed, be used in local land-use decisions. At the same time, the Board recognizes that an undue administrative burden may be placed on local government as a result of requiring amendment of their general plans once when a region is classified and again when that same region is designated.

To provide more flexibility to the Mining and Geology Board in transmitting mineral information while maintaining SMARA's provisions for local response, it is recommended:

- The State Geologist be allowed to transmit classification reports to the Board as completed by either county or region; and
 - That classification reports not be formally sent to affected lead agencies for action when designation is anticipated.
2. The kind of mineral information (MRZ-1, MRZ-2, MRZ-3) to be recognized by lead agencies in their general plans should be specified.

SMARA is not clear as to the kind of mineral information that is to be transmitted to lead agencies following classification. Section 2761(c) of the Act requires that as classification is completed, "...the State Geologist shall transmit such information to the Board...for transmittal to lead agencies." This implies that all mineral information developed by the State Geologist, pursuant to Section 2761(b), be transmitted.

Section 2761(b) specifies that the State Geologist classify areas as to whether they contain: (1) little or no mineral deposits (MRZ-1); (2) significant mineral deposits (MRZ-2); and (3) mineral deposits the significance of which require further evaluation (MRZ-3).

The Board, in its "Guidelines for Classification and Designation of Mineral Lands," also provides for a fourth classification category (MRZ-4), where available information is inadequate for assignment to any other mineral resource zone.

Upon receipt of this information, a lead agency is required to establish mineral resource management policies to be incorporated into its general plan, pursuant to Section 2762 of the Act. However, it does not seem useful for a lead agency to amend its general plan to reflect areas where no mineral deposits exist (MRZ-1) or where the lack of data precludes even speculation as to the existence of a mineral deposit (MRZ-4). This seems especially true when other categories of mineral deposits (MRZ-2 or MRZ-3) are not present within the lead agency's jurisdiction.

Areas containing significant mineral resources (MRZ-2), as well as areas containing mineral deposits the significance of which are not known (MRZ-3), are of critical interest to local planners in their carrying out of SMARA's mineral resource management responsibilities. In fact, the Act, under Section 2762, provides that a lead agency may make a more detailed assessment of MRZ-3 areas to determine the significance of their mineral deposits.

The objectives of SMARA's mineral resource conservation provisions can be achieved without an unnecessary administrative burden if only those lead agencies with MRZ-2 or MRZ-3 areas within their jurisdiction are formally given related classification information.

The Mining and Geology Board recommends the Act be clarified to require the transmittal of classification information to only those affected lead agencies with MRZ-2 or MRZ-3 areas within their jurisdiction.

3. The requirement that classification reports, which are technical in nature, be incorporated into State policy, thus the California Administrative Code, is unnecessary and should be eliminated.

SMARA requires that classification information be incorporated into State policy (Section 2761(c)). State policy, as defined in Section 2734 of the Act, appears to mean only those regulations adopted by the Board that address reclamation. However, designation is also considered to be a regulatory action and is required to be incorporated into State policy (Section 2790) and into the California Administrative Code. Thus, it could be argued that classification information, by being required to be incorporated into State policy, must also be included in the Administrative Code.

Such action is inconsistent with the nature of the classification process, which is informational. It would duplicate designation and tend to confuse the difference between designation and classification. Complying with the requirements of the Office of Administrative Law for incorporating classification reports into the Administrative Code would place almost insurmountable procedural roadblocks to the administration of this program. Therefore the Mining and Geology Board recommends that Section 2761(c) of the Act be amended to eliminate the phrase, "...for incorporation into state policy..."