

NEW MINERAL DEVELOPMENTS IN IDAHO

by

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I O O O O I I I

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The United States Government recently published Professional Paper 820---
United States Mineral Resources, by the U. S. Geological Survey. The Daily
Idahonian, May 8, saw it this way:

"The controversial theory that resources shortages may actually threaten modern civilization today won official support from a U.S. government agency for the first time.

In the first comprehensive survey of U.S. mineral resources since 1952, the U.S. Geological Survey warned that 'not merely (U.S.) affluence, but world civilization' are 'in jeopardy.'

The Geological Survey published a 722-page, item-by-item analysis of U.S. supply and demand in 64 mineral resources and warned that many of them are, or will be, in short supply.

A study prepared at the Massachusetts Institute of Technology two years ago, called 'The Limits To Growth', warned that modern civilization would overshoot the world's ability to sustain it, and would collapse unless population growth and industrial production are soon curtailed.

A similar view was expressed by British scientists in a paper called 'Blueprint for Survival'

But such ideas have been criticized by others, including public officials, who charged that the gloomy projections were based on inadequate data and shaky assumptions.

The new Geological Survey study, which set itself the task of gauging the adequacy of mineral supplies for the future, thus lends new, and for the first time official, support to the dire warnings of the 'Limits' and 'Blueprint' studies.

'Careful study of . . . the volume in its entirety,' wrote editors Donald A. Brobst and Walden P. Pratt, 'leads to the conclusion that only a few commodities are readily available to the United States in quantities adequate to last for hundreds of years.

'By no means is it too early to become concerned about future mineral supplies---and to start planning.

'The real extent of our dependence on mineral resources places in jeopardy not merely affluence, but world civilization,' they said.

Brobst and Pratt urged that the environmental problems of mining 'enormous volumes of low-grade ores' should be tackled 'squarely, realistically, and soon between industry and the public at large.'

They pointed to 'the extent to which many potential by-products or coproducts are literally being wasted---lost forever---because there is no apparent economic incentive for recovering them.' "

The implications for a state such as Idaho, rich in Federal lands, are clear. Much of the future mineral production will come from the Federal lands. Federal land use policy must be adjusted to this fact. Howard Edwards, a Vice President of Anaconda, made some germane points in a May 30, 1973, talk at Stone Mountain, Georgia, and I am paraphrasing: Metals imports loom larger in our deficit trade balance than do energy imports. Government regulation is the single largest restraint on increased mineral production. State land-use plans growing out of federal land-use legislation must include flexibility for future mineral development. End paraphrasing.

To make the point very plainly: To supply future mineral needs, all Idaho lands will have to be held open for mineral production. I refer particularly to the 30,000 square miles that make up the mountain lands, for that is where most of the metals are to be found. No one should rise up in fear that I advocate spoiling by mining all the scenic lands in the state. Far from it. It is a matter of record that mining has used about 0.3% of the surface of the United States in all mining since 1776. Supply of raw metals from Idaho will come in part from new areas no larger than those used so far---and likely smaller. I would estimate that an area not larger than one township will be required; a section here and a section or two there, for all new production in the next 50-100 years.

Unfortunately, the metals have been placed randomly in nature, controlled in ways as yet only partly known. Thus, we must contemplate mining the metals where they are found. Needless to add, I advocate that the exploration and mining be done under adequate environmental controls and that the land be restored so far as is reasonably possible when mining is done.

Mineral supply shortages are developing at an alarming rate. The course of events will be comparable to that in the current energy shortage. In this milieu it is distressing to see exploration activity in Idaho fall off sharply, largely, it appears, in response to overly restrictive land-use laws and regulations.

Private company developments will be covered first. Five of twenty exploration groups contacted report some efforts in Idaho. All of those contacted have been active in Idaho in the past. The Idaho Mining Company is continuing its exploration efforts at the Blackbird cobalt-copper mine. ASARCO will be carrying on exploration in Idaho this season, but their work will be reconnaissance in nature. Cyprus Mines Corporation in its report on First Quarter Operations for the three months ended March 31, 1973, indicates that "favorable action was taken on an expenditure request for \$1.3 million to continue development of our Thompson Creek molybdenum prospect in central Idaho. Work to date has indicated a mineralized zone of approximately 100 million tons, containing about three pounds of molybdenum per ton."

N L Industries has authorized the following statement: "N L Industries, Inc., is conducting a feasibility study for a fluorspar mine-mill complex in the Bayhorse Mining District near Challis, Idaho. Activities during 1973 include additional drilling and preliminary mine-mill planning. N L Industries is working very closely with state and federal environmental regulatory agencies to insure the project's compatibility with a healthy human environment."

The work of Homestake Mineral Development Company in Idaho at this time, "is mainly of a reconnaissance nature and is oriented toward copper, lead, uranium, zinc, gold and silver targets. We have one group of claims, staked

in 1972, in Boundary County, Idaho, and we will undertake trenching and possibly drilling on this property in 1973. Our work in Idaho in 1973 will likely involve exploration expenditures in the range of \$30,000-\$60,000."

Renewed interest in gold has appeared, in response to higher gold prices. We have heard of operations in the Florence and Warren mining districts, as well as in the Elk City region.

The Idaho Travertine Company continues in operation, marketing its stone as Idaho Onyx. Some interest continues in kyanite deposits in Clearwater and Shoshone Counties. The Revett Formation of the Belt Supergroup has been recently investigated as a possible source of commercial silica. Growing lumber shortages are bringing about renewed interest in clay, pumice, and general stone products for building materials.

Next to be covered is the work by certain Federal agencies in Idaho. The U.S. Geological Survey continues an active program in Idaho.

"The Eastern Snake River Plain pilot environmental geologic study was started in the last year, and already is contributing important information on environmental geologic problems in this part of the State, particularly on problems of surficial, volcanic, and earthquake geology. The recently published series of maps on the Henrys Lake quadrangle, by I. J. Witkind, are also an important step in providing land resources data to a wide variety of users in Idaho. M. H. Staatz' maps and reports on the Lemhi Pass thorium deposits contribute modern data that has long been needed for evaluation of thorium resources, and J. E. Harrison's studies in the Belt Basin are providing major help in understanding the origin and distribution of the Belt copper deposits and in understanding the Belt rocks in general. Many wilderness studies in Idaho are nearing completion, and a new one is to be started this year in the central part of the Pioneer Mountains."

Mineral Resources Activities

U.S. Geological Survey

9330-00089 Geochemical investigations in Alpine and Subalpine environment. Reports are in preparation on mercury and other metal anomalies east of the Cinnabar mine near Stibnite, Valley County, and on antimony and other metal anomalies south of Stibnite.

- 9330-00092 Geochemical exploration, Coeur d'Alene District. Plans this year include analyzing samples and constructing geochemical maps; a report pertaining to geochemical exploration methods in the Coeur d'Alene district is in preparation.
- 9330-00098 Geochemistry of mercury. Geochemical reconnaissance studies of mercury in soils, rocks, ores, and gangue minerals continue in the Coeur d'Alene district.
- 9350-00167 Rare-earth studies. Field examinations of thorium and rare-earth vein deposits in the Lemhi Pass area, including their occurrence, mineralogy, geochemistry, and resources, continue.
- 9350-00187 Big Creek-Yellow Pine. A study of the geology and ore deposits within a selected part of the Idaho batholith-Tertiary volcanic terrane is continuing. Six key mineralized areas are being investigated for distribution of antimony, gold, mercury, molybdenum, and tungsten. Geologic maps of the Big Creek and Yellow Pine 15' quadrangles are in preparation.
- 9370-00273 Sawtooth National Recreation Area. A report on the mineral resources of the Sawtooth National Recreation Area, Blaine and Custer Counties, is nearing completion as an open-file report and will be submitted for publication as a bulletin.
- 9370-00853 Idaho primitive area. Geological and geochemical mapping as well as stream sediment sampling have been completed in the Garden Creek-Clear Creek area to determine mineral resources potential; a final report has been published.

University of Idaho General News Bulletin - June 15, 1973:

"MOSCOW---PRIMITIVE AREA REPORT AVAILABLE---A U.S. Geological Survey report on mineral resources of the Idaho Primitive Area, done cooperatively with the U.S. Bureau of Mines, is available for inspection and study at the Bureau of Mines and Geology at the University of Idaho.

The study covers the 1,915 square miles of the Primitive Area and an additional 272 square miles adjoining the area. Studies were done on gold, silver, copper, lead, zinc, tungsten, antimony, fluorspar, rare earths, molybdenum, titanium, gem stones and barite and numerous areas are described in which the possibility of important future mineral production appears to exist.

Some \$1,671,500 worth of gold, silver, copper, lead, zinc and tungsten has been mined from deposits within the study area, but recorded mineral production from 16 districts within or adjacent to the Primitive Area had a total value of \$95,232,000.

The data contained in the report should prove to be valuable in the future as current shortages of metals and minerals intensify. Another copy of the report has been filed for public study at the U.S. Bureau of Mines offices, 447 Federal Building, 550 West Fort Street, Boise.

Potential for future gold production is reported to be best in the Thunder Mountain, Ramey Ridge, Edwardsburg and Pistol Creek districts, while silver has been produced as a by-product of gold in those districts. Minor copper deposits are found throughout the Primitive Area, while most lead and zinc have come from the Greyhound Ridge addition.

Tungsten is found in the Pistol Creek, Indian Creek, Middle Fork and Edwardsburg districts and fluorspar occurs in the Indian Creek, Salmon River, Marble Creek and Middle Fork districts."

- 9410-00138 Devonian and Lower Mississippian rocks of the western United States. Measuring, sampling, and locally mapping Devonian and Lower Mississippian sedimentary rocks in the Pioneer and Boulder Mountains are continuing; reports are being prepared.
- 9440-00194 Thorium investigations in igneous rocks. Detailed mapping and sampling in the northwestern part of the Lemhi Pass thorium district and west of North Bend continue; reports are being prepared.
- 9440-00803 White Cloud Peaks area. Geologic reconnaissance mapping in the Washington Peak, Livingston Creek, and Robinson Bar 7-1/2' quadrangles will be continued to determine the geologic setting of mineral deposits in the project area.

Environmental Geology Activities

- 9530-00547 Belt basin study. Geologic mapping at 1:250,000 in several areas as part of a project to complete a modern geologic map of the basin is continuing. Plans are being made to visit other projects in the Belt terrain to examine copper occurrences and evaluate facies changes in the stratigraphic section.
- 9530-00561 Preston 2° quadrangle, Idaho and Wyoming. The compilation of the Preston quadrangle and the preparation of a map explanation are nearing completion.
- 9530-00564 Henrys Lake area, Idaho-Montana. A report on structural relations in the Henrys Lake area is in preparation. Recently, the results of a gravity survey of the project area were submitted for publication.
- 9530-00570 Grouse 15' quadrangle, Butte and Blaine Counties. Mapping of the Grouse quadrangle is continuing, with a preliminary map of the northwest quarter of the quadrangle being prepared for publication. Microfaunal studies of upper Paleozoic rocks in and around the project area continue.
- 9530-00576 Challis volcanics. Mapping of volcanic rocks and their relation to basin and range faulting in the eastern half of the Lone Pine Peak 15' quadrangle is nearing completion.

- 9530-00577 Geology of the Malad southeast 15' quadrangle. Geologic mapping of the project area is continuing, and work will begin on map compilation.
- 9530-00582 Spokane-Wallace 2° quadrangles. Geologic mapping and rechecking in the central part of the Wallace quadrangle continues. Descriptions of Belt units and their facies changes will be prepared.
- 9530-00589 Leadore-Patterson-Gilmore 15' quadrangles. Geologic mapping of the Gilmore quadrangle is continuing. A report on Precambrian sedimentary rocks of the east-central part of the State is in preparation.
- 9530-00591 Bayhorse area. Mapping of Paleozoic rocks and late Cenozoic deposits in the Lone Pine Peak 15' quadrangle is continuing. The compilation and structural interpretation of a geological map of the Clayton 15' quadrangle is nearing completion.
- 9530-00864 Hamilton 2° sheet. An evaluation of known and potential mineral resources of base and precious metals and fluorite along the margins of the Idaho batholith and stratabound copper in the Beltian strata is planned.
- 9530-00868 Eastern Snake River Plain land resources. In an effort to derive land resource information which will be useful to planners and officials in the project area, data from various survey investigations on the Snake River Plain are being synthesized and coordinated.
- 9530-00869 Northeast flank-Snake River Plain. A preliminary geologic map of the Snake River Plain is in preparation. Work on a final version of a geologic map of Upper Red Rock Lake quadrangle, including the east end of the Centennial Range, continues.
- 9530-00870 North-central flank-Snake River Plain. Geologic mapping continues of dominantly Paleozoic rocks in the Beaverhead Range and of Tertiary and Quaternary sediments flanking the Range. Documenting geologic units and structures that bear on land use will be emphasized.
- 9530-00871 Surficial geology - Snake River Plain. Compilation and field checking of a photogeologic map of surficial units on the Snake River Plain continues. Data are being compiled for various soils maps.
- 9530-00872 Volcanic rocks - Snake River Plain. A petrographic study of ash-flow succession in the Cassia Mountains area is near completion; the petrography and chemistry of rhyolitic rocks between the Yellowstone and Blackfoot areas will be studied. Mapping continues in the Cassia Mountains, eastern Mt. Bennett Hills, and parts of the Snake River Plain. Investigations of potential and known geothermal areas in and around the Raft River Valley are planned.

9530-00873 Regional tectonic-Snake River Plain. The tectonic framework of the Snake River Plain and adjoining ranges is being analyzed to provide a basis for appraisals of seismic and associated hazards along the northern part of the Wasatch seismic belt.

9540-00604 Newport 30' quadrangle. The sampling and study of plutonic rocks in northern Idaho continues with K/Ar dating of selected samples, and a report on the age and extent of regional metamorphism is in preparation.

Geochemistry and Geophysics Activities

9730-00352 National aeromagnetic survey. Approximately 1,000 square miles of aeromagnetic surveying is scheduled for the Pioneer Wilderness study area and eventually will be incorporated into the national aeromagnetic survey.

9730-00355 Snake River Plain. Additional gravity data will be obtained southwest of the Snake River Plain, east of Island Park, and southeast of Idaho Falls. An experimental telluric current survey will be made in areas where resistivity data are available; a report on the Raft River-Albion Range area will soon be completed.

9720-00326 Genesis of the heavy metals deposits. Specific areas in the Bellevue and Baugh Creek SW quadrangles will be field checked this summer. The lead-silver deposits in the vicinity of the East Fork of the Wood River near Bellevue and Ketchum, Blaine County, will also be mapped.

The U.S. Bureau of Mines has supplied the following comments on their work in Idaho.

"The mineral resource studies of Wilderness areas, in cooperation with the U.S. Geological Survey, are continuing. Reports on the Idaho Primitive Area and the White Cloud Recreation Area will be open-filed this year. Work will be starting this field season in the Boulder-Pioneer study area. A crew of about 4 engineers or geologists and 4 students will start work about the 1st of July.

Wild River studies of the St. Joe and Salmon Rivers were completed for Forest Service use and guidance in stream classification. A study of the Bruno River will be made during this field season.

Also, the Bureau of Mines is working with the Idaho Bureau of Mines and Geology to develop a comprehensive mineral-deposit-information retrieval system."

Next to be covered are projects underway by the state agencies, including universities. The Idaho Bureau of Mines and Geology is completing county mapping projects in Benewah and Boundary Counties.

The revision of the Idaho state geologic map is being continued under the supervision of Dr. Bond. Results of some of the early work have been incorporated in the Geologic Road Map of the Northern Rocky Mountain Region (Idaho, Montana and Wyoming) published by the American Association of Petroleum Geologists in 1972. The Bureau has obtained a supply of these maps and has them available for resale at the list price of \$1.50 per copy. Emphasis by the Bureau on the state map project during 1972 was on the compilation of geologic and mineral resource data on the A.M.S. 1:250,000 scale maps. Mr. William Green has the responsibility of compiling the mineral resource data. Subsequently, the geology will be converted to the state map scale. The A.M.S. sheet work has been made possible by industry contributions amounting to \$6,500 in 1972. Continued support through 1973 and 1974 is anticipated to enable compilation of all the data into one series. As of now about 1/4 of the A.M.S. sheets have mineral inventory data plotted. The geology for the Sandpoint and Hailey sheets is nearly completed. As explained in a subsequent section of this report an attempt is being made to further improve the rate of geologic and mineral resource mapping in Idaho by incorporating ERTS and the Geophotography and Remote Sensing capabilities. We received a \$12,000 appropriation to publish the first half of the new state geologic map.

The Bureau has cooperated with the U.S. Bureau of Mines and the U.S. Forest Service at St. Maries in a study to evaluate the mineral resource potential of the St. Joe Valley and surrounding area.

Two mineral resource investigations in which the electron microprobe is being utilized are mineralogical studies of Columbia River basalts. One phase of this work under the direction of Dr. John Bond and Mr. Charles Knowles is funded by a STAR grant from the University. The Idaho Department of Highways is cooperating in the other investigation. Ron Larsen, who is a geologist from their District 4,

is spending approximately 20% of his time working with Dr. Bond and Mr. Knowles on the project. The objective of both studies is to develop criteria for determining the suitability of basalt for road construction aggregates.

Mr. Knowles has also initiated a microprobe study of Idaho thorites to unravel the complex mineralogy. Gamma ray and other spectroscopic analytical procedures will be utilized in this study. Service and other general applications of the microprobe will be discussed in another section of this report.

Mr. William Green is continuing his compilation of mineral occurrence data for Idaho. The information is being catalogued on the bases of the A.M.S. 1:250,000 scale maps but has also been plotted on the 1:500,000 scale which will eventually cover the entire state. The Challis and Dubois quadrangles were completed in 1972 and work has started on the Ashton quadrangle.

Mr. C. N. Savage is compiling data on occurrences of Idaho's industrial or nonmetallic minerals.

Water resource studies conducted by Bureau personnel, except for one project which is supported by the Water Resources Research Institute at the University, are oriented toward problems connected with mining and mineral processing. A project to study the sources and possible means of controlling acid mine water drainage at the Bunker Hill Mine is being headed by Mr. Dale Ralston. He has three graduate students working on the project. Seven measuring stations have been installed and many water samples from each have been analyzed. This is a three-year project that is to be funded annually by the U.S. Bureau of Mines. A paper that summarizes the first year's progress was presented at the annual A.I.M.E. meeting in Chicago in February.

A study designed to measure the hydrologic cycle in an abandoned tailings pond is another project that is active in the Coeur d'Alene mining district. It is also under the direction of Mr. Ralston and is funded by the U.S. Bureau of Mines. Piezometers have been installed in the old Page mine tailings to quantitatively measure various parts of the hydrologic cycle.

The Bureau received another grant in 1972 from the U.S. Geological Survey to partially support the research of Dr. W. B. Hall on the development of his techniques for obtaining stereo color oblique air photos. The procedure has been refined to where it is receiving considerable attention in practical applications in geologic and soil mapping. During the summer of 1972 approximately 5000 pairs of photos were obtained for nine geologists and one soil scientist in twelve different areas for U.S. Geological Survey sponsored projects. Two archeological sites on the Snake River Plain in southern Idaho were also photographed for University of Idaho and Washington State University research. During November and December while Dr. Hall was a visiting scientist at the U.S. Geological Survey's office in Denver, he presented four lectures and demonstrations on the procedure.

As a service to the people in the mineral industry, Mr. Charles Knowles presented seminars on the uses and applications of the electron microprobe in Pocatello in June and in Kellogg in July. In October a three-day short course on the microprobe was offered in Moscow for those desiring to learn more about the operation of the instrument. Several requests from mining companies for microprobe analyses of materials containing finely intergrown mineral assemblages were handled during the year. The microprobe has also been used as a tool in support of research by other divisions at the University.

Requests for data on geology and mineral resources from various Federal agencies involved in land use studies or projects of a similar nature are increasing each year. In some cases a considerable amount of time and effort is required to assemble the requested data. In most instances, however, the inputs are acknowledged with appreciation and it is felt that they are bearing some weight in the decision-making processes. The Bureau cooperates freely with other Idaho State agencies involved in land and natural resource management studies.

With Dr. Leland Mink stationed at Boise State College, the Bureau is in a better position than it formerly was to render service in southern Idaho. Much of this activity is in cooperation with other agencies of Idaho's state government

During the last half of 1972 and the early part of 1973 Dr. Mink has been working with the Lieutenant Governor's office making field investigations for the In Lieu Land Selection Committee. He has also been working with the Department of Public Lands in an advisory capacity for geothermal, oil and gas matters Assistance has been given to the District Health Office in determining the permeability and porosity of local gravels to be used for sewage drain fields in Ada County. In addition to his teaching at Boise State College, Dr. Mink is helping with a short course being offered to water and sewage plant operators by the State Department of Environmental Protection and Health. Dr. Mink will also enter into some cooperative work with the U.S. Geological Survey environmental geology project in southeastern Idaho.

A research grant request in the amount of \$295,592 has been submitted to NASA to fund the joint effort of the Bureau and the College of Mines to better utilize the Geophotography and Remote Sensing Center (GRSC) now on the campus at the University of Idaho. The title of the proposed project is "Geology Compilation Mineral Investigation and Land-Use Evaluation through ERTS-B". R. R. Reid is the principal investigator on the project with most of the Bureau staff and several College staff listed as co-investigators. The abstract of the investigation as presented in the proposal is as follows:

"This 27 month study will integrate ERTS imagery into state-wide geologic, mineral and geothermal potential and land-use consideration studies now being carried out by the Idaho Bureau of Mines and Geology and the College of Mines, University of Idaho. A Geophotography and Remote Sensing Center (GRSC) has been established on campus to facilitate the state mapping and compilation programs and the capability to use ERTS orbital and underflight imagery will be added. The ongoing programs will provide the ground truths for the imagery interpretations and our color oblique stereo airphoto (COSA) research

program will assist in improving imagery interpretation. The program includes development of capability to handle, reproduce and cartographically-photographically enhance orbital and sub-orbital images as well as derive maps. This will improve visualization and comprehension by both technical and non-technical users throughout the state."

In a state such as Idaho where roughly 75 percent of the area is public land, a capability to make rapid interpretations on the geology and mineral potential for input into land classification studies is absolutely essential. Routine field methods for obtaining this information are far too slow for our present needs where almost daily, Federal and State administrators are being called upon to make decisions in public land matters. Withdrawals are being made and will continue to be made. Each reduces to some extent the economic base of the state. The need to have firm and accurate data upon which to make the decisions is unquestioned.

The core of the proposal is to establish a well equipped and staffed center on the campus to receive, process and analyze ERTS-B imagery. I am proposing that the new staff position that is to be established for the Bureau be the Remote Sensing Coordinator who will have overall responsibility for the center and resource evaluation. His first responsibility will be to acquire the geologic and mineral resource data being demanded by the land classification activity. This will be accomplished by merging the ERTS-B imagery with our ongoing research.

Projects that will be materially accelerated are:

1. The new state geologic map.
2. Mineral and geothermal inventory.
3. Capability to supply useful mineral resource and geologic data to Federal and State agencies involved in land classification studies.

Ground truths from our present mapping programs and from our research in color oblique stereo air photo work will be rapidly integrated with ERTS-B data. Solutions to area-wide problems that remain unresolved by ground mapping are almost certainly to be a dividend of ERTS-B imagery evaluation. Inherent in the successful attainment of this objective is the development of cartographic means of

adapting imagery to ongoing projects and presenting the evaluation in forms which can be easily understood by non-technical reviewers.

A new kind of project keyed to what seems to be a rapidly expanding area of need, and based upon increasing service demands, has been approved. This will begin with a test project: The Coeur d'Alene Geologic Folio Project, by C. N. Savage.

In explanation: The U.S. Geological Survey and other groups are developing country-wide pilot projects centered, among other places, around Aspen, Colorado; Hartford, Connecticut; the San Francisco Bay area, California; and Henrys Lake, Idaho. The purpose of these projects is the preparation of folios of geologically-based data maps, which are proving of increasing value to land-use, planning, management, environmental problems, and the proper development and conservation of all kinds of mineral resources (including discovery, inventory and development).

These basic data maps begin with a geological map and other special geologically oriented maps are developed by supplementary field and office studies. Data relative to other disciplinary sciences then may be plotted on these geological data base maps. Among others, in addition to the basic geologic map, the following data maps are prepared (tailored to specific area needs and sites): Construction Materials (sand, gravel and stone), Metallic Minerals, Natural Slope Stability, Ground Water, Surface Water, Flood-Prone Areas, Geologically Related Construction Hazards, Non-metallic Industrial Materials, Potential and Available Water Resources, Mines, Prospects and Potentially Mineralized Areas, Landform Types and Distribution, Surficial Geologic Materials, Top of Bedrock, Top of Weathered Rock, etc.

Because of the increased number of requests for assistance from state-wide economic development associations, resource and development, and environmentally related projects, we think this project would constitute another good use of our

specialized abilities. Therefore, in view of our continuing advisory assistance, particularly to the North Idaho Economic Development Association and the panhandle six-county Resource, Conservation and Development Project (with their enthusiastic endorsement), we propose to prepare a Coeur d'Alene Geologic Map Folio. We expect to use a 7-1/2 minute topographic map base and within the next year complete:

Map

- A General Geology
- B Ground Water Geology
- C Industrial Rocks and Minerals (e.g., silica rocks, clays, etc.)
- D Geologic Construction Materials (e.g., sand, gravel and stone)
- E Geologically Related Construction Hazards

If this project is successful, we will plan comparable ones for other major cities in Idaho.

A final project getting underway involves a proposal to the National Science Foundation for funded research in geothermal energy exploration. This is being done cooperatively with the states of Washington and Montana; in Idaho, the cooperating agencies include the University of Idaho, the Bureau of Mines and Geology, the Department of Water Administration, Boise State College, and the Nuclear Energy Commission.