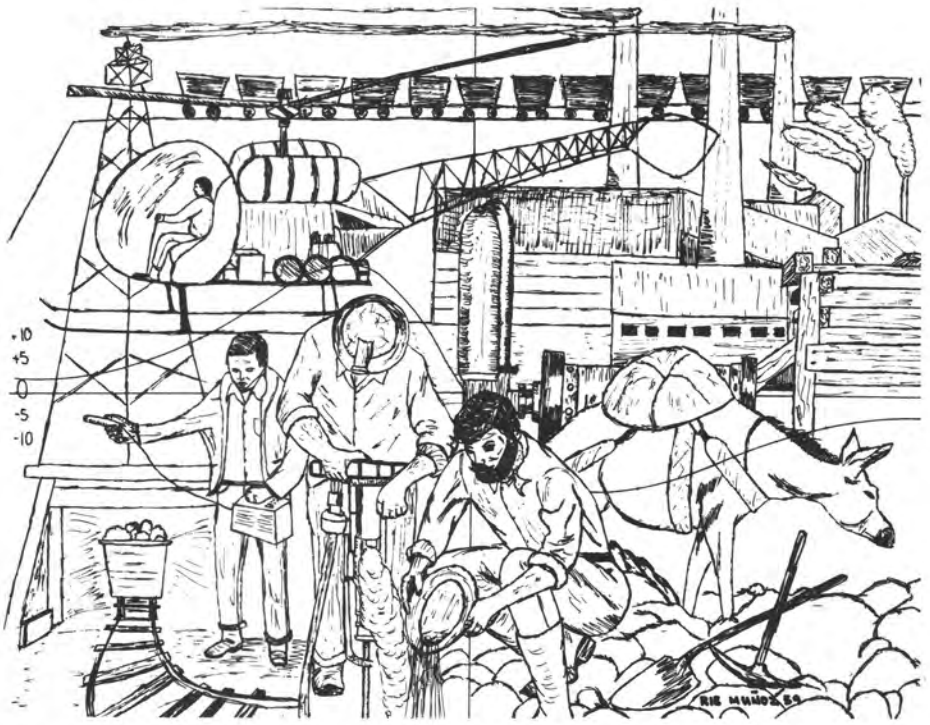
A PUBLICATION OF THE WASHINGTON STATE DIVISION OF GEOLOGY AND EARTH RESOURCES

WASHINGTON GEOLOGIC NEWSLETTER



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SOME DEVELOPMENTS IN MINERAL EXPLORATION IN WASHINGTON DURING 1975

Many regions of Washington underwent exploration for metals, coal, oil and gas, and geothermal energy in 1975 despite some declining metal prices and some cutbacks in exploration budgets. Whereas in 1974 around 50 mining and exploration companies were engaged in mineral exploration, this year over 60 companies were active in Washington. It is estimated that these companies spent in excess of $3 million in the search for metals and new energy sources. As in the past, most exploration was directed towards the discovery of new metal deposits; however, exploration activity for coal, geothermal energy, and oil and gas increased. Widespread concern over future energy supplies is, no doubt, at least partially responsible for the increase in exploration activity for new energy sources. The increase in mineral exploration has resulted in more applications for mineral leases on state land, which in 1975 were up 25 percent over last year. The majority of the applications was for lands in Stevens, Pend Oreille, and Spokane Counties, which appear to have uranium possibilities.

Metals

by Wayne S. Moen

As in 1974, copper and uranium appeared to be the most sought after metals in Washington. The search for new deposits of lead and zinc declined, whereas, the search for gold and silver increased. Various companies undertook geochemical, geophysical, and geological surveys in many parts of the state. Compared with the past 5 years, a definite increase was noted in the amount of core drilling that took place this year; the bulk of the drilling was done on copper and uranium deposits.

In general, exploration for metals was undertaken in the Okanogan Highlands physiographic province of northeastern Washington, which extends from the Idaho border to the eastern foothills of the Cascades, and in the Cascade Mountains province in the west half of the state, which extends from the Canadian border to the Columbia River. Within these provinces, primary and secondary areas of mineral exploration are shown in figure 1. These areas are as follows:

1. Mount Baker district of Whatcom County.
2. Glacier Peak, Monte Cristo, Index and Silver Creek districts of Snohomish County, and the Chiwawa district of Chelan County.
3. Wenatchee and Blewett districts of Chelan County, and the Swauk and Cle Elum districts of Kittitas County.
4. St. Helens and Washougal districts of Skamania County.
5. Conconully, Twisp, and Mazama districts of Okanogan County.
6. Loomis and Nighthawk districts of Okanogan County.
7. Myers Creek and Sheridan districts of Okanogan County, and the Danville district of Ferry County.
8. Northport and Orient districts of Stevens County.
9. Deer Trail and Springdale districts of Stevens County.

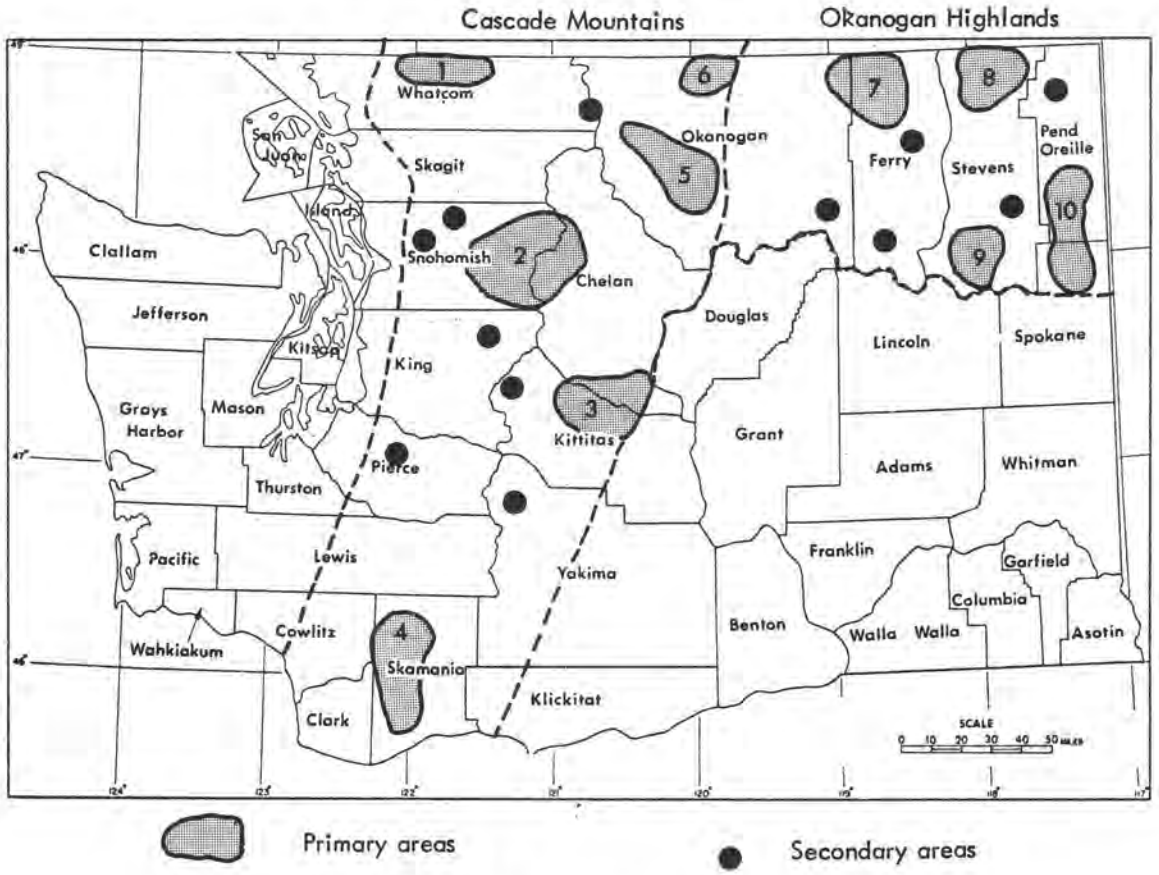


FIGURE 1.—Areas of metallic mineral exploration in Washington, 1975.

10. Newport district of Pend Oreille County, and the Mount Spokane district of Spokane County.

Secondary areas of mineral exploration are shown by dots in figure 1 and will be mentioned in the discussion that follows. In the areas of exploration shown in figure 1, about 80 percent of the exploration took place in areas designated as primary areas.

Copper Exploration

As can be seen in figure 2, many areas of the Cascade Mountains, as well as several areas of the Okanogan Highlands, were under investigation for copper. In the extreme northwestern part of the Cascades, Texasgulf Inc. core drilled throughout the summer and fall on Church Mountain, near the settlement of Glacier in Whatcom County.

In western Snohomish County, Petrowest Resources investigated the copper reserves of the Wayside copper mine near Granite Falls. Elsewhere in the county, several major mining companies were exploring copper deposits in the Helena Peak area south of Darrington, as well as deposits in the Glacier Peak, Monte Cristo, Index, and Silver Creek districts of eastern Snohomish County.

In central Pierce County, several companies investigated copper-tourmaline occurrences in the Coplay Lakes area of Carbon Ridge.

The Southern Cascades continues to be an active area with Exxon and Amoco Minerals Co. staking large blocks of claims in 1975. Amoco core drilled throughout the year at their Copper Creek property of southwestern Skamania County, while in the northwestern part of the county Duval drilled throughout the summer at their Ryan Lake deposit.

Along the eastern slope of the Cascades, several other areas were under investigation for copper.

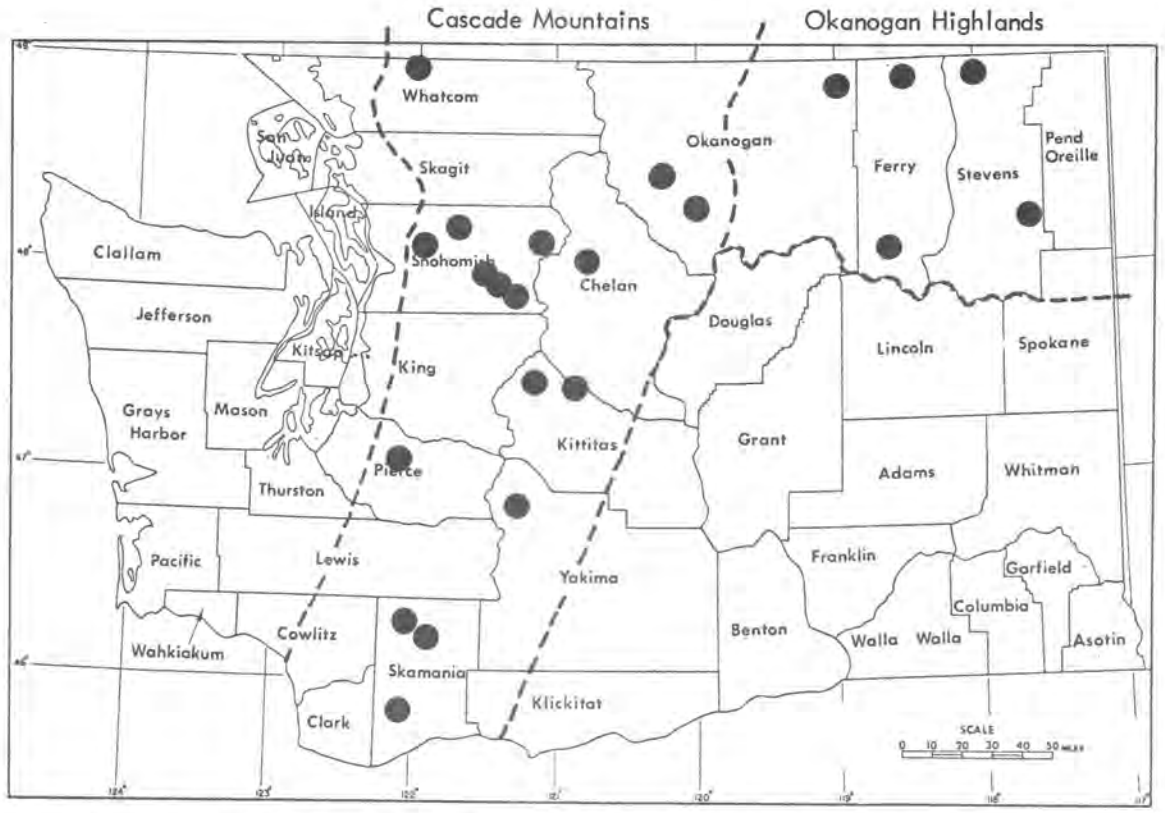


FIGURE 2.—Areas of copper exploration in Washington, 1975.

In western Okanogan County near Mazama, Quintana Minerals Corp. undertook further drilling at their property on Goat Creek, while on Buck Mountain west of Okanogan, an Idaho-based mining company drilled throughout the summer and fall in an area of anomalous mineralization.

Exploration activities in Chelan County fell off this year as compared with last year, when several parts of the county were being investigated. Texas-gulf appeared to be the only company engaged in copper exploration; they core drilled throughout the summer at the Red Mountain mine in the Chiwawa district of northwestern Chelan County.

In Kittitas County, exploration work appeared to be confined to the Gold Creek and Cle Elum River districts in the northwestern part of the county. In the Van Epps Pass area of the Cle Elum River district, a new copper-molybdenum discovery was under investigation by Silver Standard Mines Ltd.

Although several mining companies were exploring the Morse Creek-Mesatchee Creek area of northwestern Yakima County, exploration activity in this area declined somewhat from 1974.

At least four areas of the Okanogan Highlands underwent exploration for copper in 1975. In the Myers Creek district of northeastern Okanogan County, Dresser Industries core drilled throughout the summer near the summit of Buckhorn Mountain.

In north-central Ferry County near Danville, Coastal Mining Co. continued to explore the Lone Star mine for copper. In southwestern Ferry County near Keller, Bear Creek Mining Co. continued to investigate their copper-moly deposit on Tolman Mountain.

Several parts of Stevens County were also explored for copper in 1975. At least four companies were investigating the Rossland Volcanics of northern Stevens County, between Northport and Orient. Although these rocks have not yet been a significant host rock for copper deposits in Stevens County, they have been important for copper a few miles north in British Columbia.

Uranium Exploration

Because of rising uranium prices and predicted shortages of the metal in the near future, exploration for uranium in Washington increased in 1975. Although several parts of the state were under investigation, exploration for uranium was confined mainly to Pend Oreille, Spokane, Stevens, and Ferry Counties.

In Stevens County most exploration work took place in the vicinity of the Midnite mine, which is the state's only producing uranium mine. Midnite Mines Co. actively explored their property, as well as large areas to the north of the mine, with an extensive core drilling project. A few miles south of the Midnite mine, Western Nuclear continued to develop their Sherwood property that contains substantial uranium reserves. Several miles northwest of the Midnite mine, Exxon core drilled on land where they have been exploring for several years.

In northern Ferry County, several companies investigated the pegmatitic uranium deposits of the Kettle Range, which to date have not been productive.

In west-central Pend Oreille County, Tertiary sedimentary rocks, as well as uraniferous vein deposits in granitic rocks, were under investigation by several major mining companies.

In the Mount Spokane area of northern Spokane County, Wyoming Minerals Corp. as well as several other companies, were examining the autunite-bearing alaskites of the area, which have been productive in the past.

Lead and Zinc Exploration

Exploration for lead and zinc decreased in 1975, as compared with 1974. Although general re-

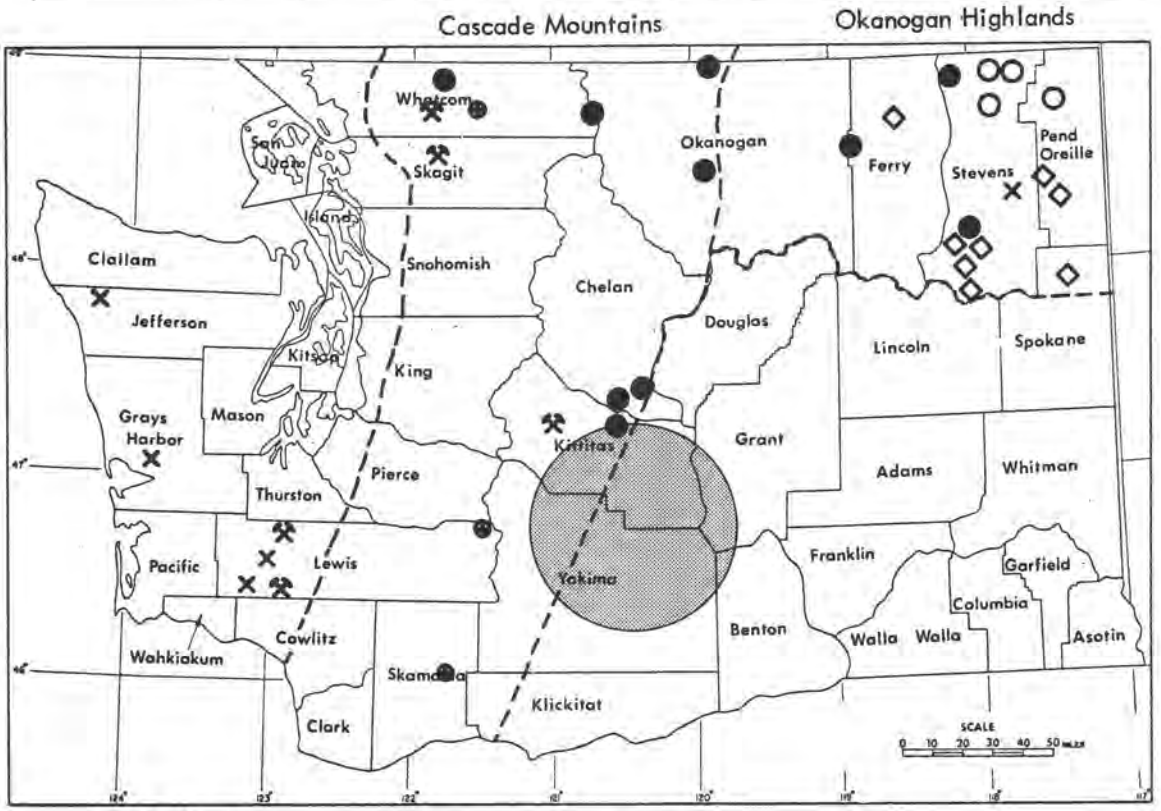


FIGURE 3—Areas of uranium, lead-zinc, gold-silver exploration in Washington, 1975.

connaissance for these metals was carried out in parts of the Cascade Mountains and Okanogan Highlands, the lead-zinc districts of Pend Oreille and Stevens Counties continued to receive the most attention.

At Metaline Falls in northern Pend Oreille County, Bunker Hill Co. continued to explore and develop new ore bodies at the Pend Oreille mine, the state's major lead-zinc producer.

In the Deep Lake area of northern Stevens County, Cominco American terminated their exploration program at the Calhoun mine in July. For the past several years, Cominco had extensively explored the area for lead and zinc. At the Van Stone mine south of Northport, Callahan Mining Corp. worked throughout the year exploring the zinc potential of the mine.

Elsewhere in northern Pend Oreille and Stevens Counties, several past producers of lead and zinc were examined, and several geochemical surveys were completed.

Gold and Silver Exploration

Renewed interest in gold and silver resulted in an increase in exploration for these metals in Washington. Most work appeared to be confined to the major gold mines of the past, to determine if any large low-grade ore bodies exist. Also, several small gold and silver mines were under investigation by small mining companies and individuals.

In the Mount Baker district of central Whatcom County, Hanna Mining Co. core drilled a gold and silver bearing breccia at the Great Excelsior mine. In the Slate Creek district of eastern Whatcom County, Hecla Mining Co. was engaged in mapping and sampling a gold-bearing breccia at the New Light mine.

In Okanogan County, several districts were being examined for gold and silver. The gold deposits of the Myers Creek district of northeastern Okanogan County were investigated by several companies who were looking into the possibility of large low-grade gold deposits. At the Ruby mine in the Nighthawk district of north-central Okanogan County, work was under way to reopen the mine, a past producer of high-grade silver ore. In the Conconully district of central Okanogan County, several companies were taking a close look at the old silver-producing mines of the district.

In the Wenatchee area of southern Chelan County, the gold-bearing reefs of the area were under investigation by Cyprus Exploration Co., while several other mining companies were looking into the gold possibilities of the Blewett and Swauk districts.

In the Republic district of Ferry County, the Knob Hill mine continued to operate as the state's only gold producer. Little in the way of exploration took place in the Republic district this year; however, a few miles northwest of Republic in the Sheridan district several silver properties were under investigation.

At least two districts in Stevens County were examined for gold and silver. In the northwest part of the county, several companies studied the gold deposits of the Orient district, while in southern Stevens County, several silver mines of the Deer Trail district were under investigation.

The following list contains the names of mining companies that were active in Washington during 1975. Several other companies undertook exploration projects in the state, but they do not wish to be identified.

Mining Companies Active in Washington in 1975

Bunker Hill Co.
Cominco American
Callahan Mining Co.
U.S. Borax Co.
Western Nuclear Inc.
Utah International Inc.
Amoco Minerals Co.
Duval Corp.
Hecla Mining Co.
Cyprus Exploration Co.

Midnite Mines Co.
Exxon
U.S. Steel
Coastal Mining Co.
Hanna Mining Co.
Aquitaine
Excel Exploration Ltd.
Wyoming Minerals Corp.
Pioneer Nuclear Inc.
Spenst Hansen

Quintana Minerals Corp.
Nesco Mining Corp.
Inspiration Development Corp.
Bear Creek Mining Co.
Texasgulf Inc.

American Copper & Nickel Co.
Western Mines Ltd.
Cities Service Minerals Corp.
Petrowest Resources Inc.
Bethlehem Copper Corp.
Burlington Northern

St. Joe Minerals Corp.
Silver Standard Mines Ltd.
A. U. Minerals Inc.
New Cinch Uranium Ltd.
Pechiney Ugine Kuhlmann

Hearne Ltd.
Dresser Industries
Continental Oil Co.
Boggs Brothers
Sunshine Valley Minerals Inc.

Geo-Mineral Exploration Co.
P & H Mining Co.
American Standards Exploration Inc.
Natural Resources Development Corp.
Tec-Ton Exploration & Development Corp.

Silver Bowl Mining Co.
Klondike Gold & Silver Corp.
Yukonadian Mineral Explorations Ltd.
Empire Explorations Inc.
The International Nickel Company of Canada, Ltd.

Coal

by Ellis Vonheeder

In 1975 several coalfields of Washington were under investigation by American and Canadian coal mining companies. Considerable exploration activity was concentrated in the Glacier coalfield of western Whatcom County. In this area, Canadian-American Exploration Co. carried out several rotary and diamond drilling projects to better define the coal reserves of the area.

Some interest was shown in the Hamilton coalfield of central Skagit County; however, exploration appears to have waned when compared to 1974.

The Centralia strip mine continues to produce from 3.5 to 3.8 million tons of coal per year, which is over 99 percent of Washington's coal production. The mine is operated by Washington Irrigation & Development Co., while Pacific Power & Light Co. operates the steam-electric generating plant.

In the Toledo area of southwestern Lewis County, lignite deposits were under investigation by an Alberta-based Canadian coal mining company. This same company also investigated bituminous coal deposits of the Roslyn field in central Kittitas County.

Oil and Gas

by Ralph Kimmel

Several major oil and gas companies were actively engaged in the search for oil and gas, as well as for additional underground gas storage fields in Washington.

In the eastern part of the state, Shell Oil Co. completed geophysical exploration projects on leased land in parts of Kittitas, Yakima, Grant, and Benton Counties. In Stevens County, Giant Minerals Corp. of Spokane drilled for oil and gas near Chewelah.

In western Washington, El Paso Products Co. drilled test wells for oil south of Forks in the Hoh River area of western Jefferson County and in the Aberdeen-Hoquiam area of southwestern Grays Harbor County. In the Montesano area of southwestern Grays Harbor County, Northwest Exploration Co., a subsidiary of Northwest Pipeline Corp., drilled an exploratory test well. Northwest Pipeline Corp. also drilled several stratigraphic test wells in western Lewis County in an effort to delineate favorable underground gas storage areas. Elsewhere in western Lewis County, Discovery Oil and Gas Co. drilled sporadically at their well near Vader.

A total of 33,170 feet of exploratory drilling for oil and gas was completed in Washington during 1975. Of the total, 14,776 feet of hole was drilled by Washington Natural Gas Co. at their Jackson Prairie gas storage area in Lewis County.

Geothermal

by J. Eric Schuster

Exploration for geothermal energy was carried out in at least three areas of Washington during 1975. In the Southern Cascades, Washington Department of Natural Resources drilled six heat-flow holes in the Steamboat Mountain-Big Lava Bed area of Skamania County. Drill holes reached depths of 500 feet in an area of young basaltic volcanism. Preliminary indications suggest that the flow of heat upward through the earth's crust is only slightly higher than normal.

Near White Pass in northeastern Lewis County, Amax Exploration Co. drilled several heat-flow holes to assess the geothermal energy potential of the area. Elsewhere in the Cascade Mountains, several other companies sampled hot springs, ran microseismic surveys, and took aerial infrared photographs of several prospective geothermal areas.

On Mount Baker in Whatcom County, the increased fumarolic activity of the mountain was monitored by several local universities and the U.S. Geological Survey. Their investigations and the future behavior of Mount Baker could affect the course of geothermal exploration in Washington.

STAFF PROFILE

JACK WUNDER

Jack came to work for the Division of Geology and Earth Resources on November 3, 1975 to study tectonic activity in the Puget Sound area in cooperation with the U.S. Geological Survey. He is currently attempting to locate and date marine terraces that have been shifted out of their original positions by tectonic forces (faulting and folding) rather than by glacier-caused changes in sea level. It is anticipated that the investigation will provide geologic information useful for selecting sites for nuclear reactors and oil pipelines.

Jack is completing final requirements for his M.S. degree in geology from the University of Cincinnati in Ohio, where he obtained his B.B.A. He did graduate work in geology at Miami University in Oxford, Ohio, and was employed as a geologist with the Virginia Division of Mineral Resources.

Our new employee enjoys almost all outdoor activities and is especially looking forward to hiking and mountain climbing. Jack is 27 years old, single, and enjoys collecting minerals, reading, all kinds of music, and playing chess.

"The part of wisdom is to know that we don't know, and not fool ourselves with long words."

Upton Sinclair

WASHINGTON MINERAL PRODUCTION - 1975

by Wayne S. Moen

U.S. Bureau of Mines preliminary production figures for 1975 show the value of mineral production in Washington as $142.6 million, which is a decrease of $1.33 million over 1974. Decreases were noted in the production of cement, sand and gravel, stone, and coal, whereas the production of lead, zinc, and uranium increased.

The state continues to be an important producer of aluminum, copper, and silver. Using out-of-state raw materials, six aluminum refineries produced around 1 million tons of primary aluminum, which is 24 percent of the nation's primary aluminum. The Tacoma smelter, which is the only copper smelter in the Pacific Northwest, produced around 120,000 tons of primary copper and 12 million ounces of silver and 180,000 ounces of gold from out-of-state ores. This represents about 6.5 percent of the nation's primary copper.

Beginning in February 1976, the state will become a significant producer of magnesium when Northwest Alloys, Inc., a subsidiary of the Aluminum Company of America, places its new magnesium plant at Addy, Washington, into operation.

WASHINGTON MINERAL PRODUCTION (a)

Product	1974		1975 (p)	
	Quantity	Value	Quantity	Value
Cement short tons	1,381,602	$36,550,000	979,000	$26,924,000
Coal ...Do...	3,913,000	w	3,700,000	w
Sand and gravel	22,841,584	35,030,000	21,015,000	31,522,000
Stone ...Do...	15,095,000	24,483,000	13,657,000	22,831,000
Lead ...Do...	1,299	585,000	1,900	821,000
Zinc ...Do...	6,908	4,960,000	10,800	8,446,000
Undistributed (b)		42,308,000		52,040,000
Total value		$143,916,000		$142,584,000

(a) Production furnished by the U.S. Bureau of Mines.

(b) Includes clay, diatomite, gypsum, lime, olivine, talc, peat, coal, gem stones, copper, silver, gold, and uranium.

(w) Withheld to avoid disclosing individual company confidential data.

(p) Preliminary figures.

U.S. GEOLOGICAL SURVEY 7½-MINUTE TOPOGRAPHIC QUADRANGLES

(New maps received in the division library since September 1, 1975)

Name	Latitude (indicates southeast corner)	Longitude	County
Four Lakes	117°30'00"	47°30'00"	Spokane
Medical Lake	117°37'30"	47°30'00"	Spokane
Spokane NE	117°15'00"	47°37'30"	Spokane
Spokane SE	117°15'00"	47°30'00"	Spokane

DIVISION PUBLISHES NEW REPORTS

The Division of Geology and Earth Resources released the following two publications in December:

Information Circular 57, "Handbook for gold prospectors in Washington," by Wayne S. Moen and Marshall T. Huntting, 13 figs., 90 p. Price: $1.50.

GM-13, "Geologic map of the Destruction Island and Taholah quadrangles, Washington," by Weldon W. Rau, text and map on 1 sheet, scale: 1 inch=1 mile. Price: $3.50.

These may be purchased from the Department of Natural Resources, Division of Geology and Earth Resources, Olympia, WA 98504.

NEW BOOK AVAILABLE FOR MINERAL COLLECTORS

A compilation of mineral occurrences in Washington that emphasizes crystal localities and that is directly designed for the mineral collector has recently been published. The book "Minerals of Washington" includes descriptions of over 400 minerals occurring in the state, along with many excellent sketches. A copy has been placed in the Division of Geology and Earth Resources reference library by the author, Bart Cannon. The 184-page book is available at bookstores for $4.95; the publisher is Cordilleran, Mercer Island, WA.

THANK YOU—BUT IT WASN'T EASY!

As most of you know, we recently sent out inquiries to all those on our various mailing lists in an effort to update the mailing addresses. The response was gratifying. However, everything these days is computerized; ergo, work is easier. Don't you believe it. It is impossible to make an address correction on a label and add this name to another mailing list at the same time. If you try this reasonable method, the machine has the last laugh—everything on this label is deleted, gone forever. Therefore, a new approach must be made. There are several pitfalls in new approaches, too; I think we found most of them. We feel now that we have mastered the system and all changes and corrections are complete. No doubt, this is an erroneous feeling. If you receive this newsletter, obviously we have done the right thing.

Laura Bray, Editor

DIVISION OF GEOLOGY & EARTH RESOURCES PARTICIPATES IN STATEWIDE PRIVATE FOREST LAND SOIL SURVEYS

During the last several years, the division staff has increased its assistance to other Department of Natural Resources' activities. Earlier this year, Kurt Othberg, staff geologist, began full-time participation with the Division of Technical Services' newest section, the Private Forest Land Grading Program (P.F.L.G.). Until the end of 1980, when the P.F.L.G. program is due for completion, he will be working under the auspices of the P.F.L.G. program and will be providing geological input and advice to field survey teams.

The P.F.L.G. program is designed to survey soils and tree growth on all private forest land to determine timber productivity and logging operability. (Operability is used to describe the sum of the various factors that determine the economics of harvesting timber, including relief, soils and rock stability, climatic conditions, etc.). The resulting grading system will be used by the Department of Revenue county assessors as a basis for equitable forest land taxation.

In order to successfully rate productivity of land that is in all stages of timber growth (from clearcuts to old growth), the P.F.L.G. program is relying

heavily on soils mapping. By 1980, the program will have either conducted field surveys or correlated published surveys for all private forest land in the state. Results of the soil surveys will be correlated with tree growth measurements to arrive at land productivity classifications. The soils mapping will also be utilized to assign operability classifications. Soils are currently being mapped in four multicounty areas of the state: Stevens-Pend Oreille; Kittitas-Yakima; Klickitat-Skamania; and Grays Harbor-Pacific-Wahkiakum. In 1976, new areas will be added. Some large blocks of private forest land have previously been mapped, but will require checking and correlation to meet the needs of the P.F.L.G. program.

The geologic role in the program includes: (1) assisting soil scientists in familiarization with geology, (2) interpreting geomorphology with special emphasis on landforms and mass wasting processes, and (3) surficial geologic mapping which will enhance the efficiency of the soils mapping. In addition, geology provides a critical input to the analysis of slope stability problems affecting logging road construction and maintenance.

Kurt's work has probably had its greatest impact on the reconnaissance phase of soil surveying, during which genesis of soils and the relationships between soils and landscape are interpreted. Development of good working hypotheses for the origin of the soils to be mapped increases the predictability of their location, and therefore increases the speed and accuracy of the mapping.

The Private Forest Land Grading Program may be a landmark in cooperative scientific work between geologists, soil scientists, and foresters; the final product of this multidisciplinary team will be more useful than if the three different disciplines worked separately.

Such a multidisciplinary approach could be put to use by other agencies; apparently the U.S.D.A. Soil Conservation Service is considering implementation of a greater geologic role in their soil surveys.

INSTALLATION OF GRAVITY STATIONS COMPLETED

Norman Rasmussen, University of Washington seismologist, has completed installation of a network of 55 gravity stations on bedrock in western Washington. He will be measuring gravity annually to observe systematic changes in elevation. This long term elevation change investigation using gravity measurements was first proposed for the Puget Sound area nearly eight years ago (Bostrom and others, 1968).

Western Washington is an area that periodically experiences large earthquakes, but reveals little geologic evidence of the faults from which the earthquakes originate. Hopefully, Mr. Rasmussen's measurements of minute elevation changes may provide clues to the locations of future seismic activity. However, it may take another 8 years for the measurements to show significant trends.

Reference

Bostrom, R. C.; Couch, R. W.; Rasmussen, N. H.; Sherif, M., 1968, An observation program on level changes and the incidence of seismicity in the Puget Sound area: University of Washington Trend in Engineering, v. 20, no. 2, p. 18-20, April, 1968.

NORTHWEST MINING ASSOCIATION PUBLISHES SERVICE DIRECTORY

Many mining companies and individuals will find a great deal of pertinent information in the new Service Directory recently compiled and published by the Northwest Mining Association. The section entitled "Professional Services" lists names, addresses, and phones for companies and consultants in engineering, environmental, financial, geochemical, geological, mining engineering, public relations, and many other areas closely allied to the mining industry.

The reader will find a very useful section on selected government agencies and related mining in-

formation on the national level; on the states of Alaska, Montana, Idaho, Oregon, and Washington; and on the Canadian Federal and Provincial areas. For instance, for Washington State the directory lists the state agencies, the people in charge, addresses and phones, etc. for all the various permits needed in a mining operation.

For information concerning the Service Directory, send your inquiries to:

Service Directory
Northwest Mining Association
P. O. Box 2163
Spokane, WA 99210

(509) 747-5328 or 624-1158

U.S. GEOLOGICAL SURVEY OPEN-FILE REPORTS

The following open-file reports from the U.S. Geological Survey are now available for inspection in the Division of Geology and Earth Resources library:

Schlumberger soundings in the Moscow, Idaho-Pullman, Washington area, by Dallas B. Jackson, 28 p., 25 figs. Open-file report 75-584.

A study of earthquake losses in the Puget Sound, Washington area, 298 p. Open-file report 75-375.

Principal facts for gravity stations in the Spokane area Washington, by Richard F. Meyer and Dolores M. Wilson, 12 p. Open-file report 75-503.

Exploration for uranium deposits in metasedimentary rocks in the light of geologic studies of the Midnite mine, Washington, by J. Thomas Nash, 5 p. Open-file report 75-638.

Aeromagnetic map for part of southwestern Washington, 4 pls., map scale - 1:62,500. Open-file report 75-648.

These reports may also be inspected at the U.S. Geological Survey, Room 678, U.S. Courthouse, in Spokane.

WENATCHEE AREA MAPPING PLACED ON OPEN FILE

Geologic mapping of the Wenatchee area done in the summer of 1975 by Dr. Randall Gresens, of the Dept. of Geological Sciences at the University of Washington, is now available for inspection in the Division of Geology and Earth Resources library. Dr. Gresens' work covers the front of the Wenatchee Mountains between the Horse Lake road and Squilchuck Canyon and reveals many interesting and formerly unrecognized structures and geologic units. The map scale is 1:1,000.

The material is in reproducible form; however, the only colored copy is a library copy. Persons wishing a copy of this map would have to either color it here in the library or hire someone to do the coloring.

YOUR STATE GEOLOGIST REPORTS

Over the years, withdrawal of public lands from entry for mineral exploration has taken place in many forms. This has been done in an uncoordinated way and without regard for the ensuing consequences to the long-term mineral position of America. In an effort to evaluate the effect on our nation, Gary Bennethum and L. Courtland Lee, both professional employees of the Dept. of the Interior, have put together on their own time the bits and pieces of available information dealing with land withdrawals. The results of their work are published in the Mining Congress Journal (Sept. 1975 issue) as "Is Our Account Overdrawn?"

If the mining industry is going to survive, we are going to have to make more individual efforts to

FIGURE 1

PUBLIC LANDS EXCLUDED FROM MINERAL EXPLORATION AND DEVELOPMENT UNDER THE MINING LAW

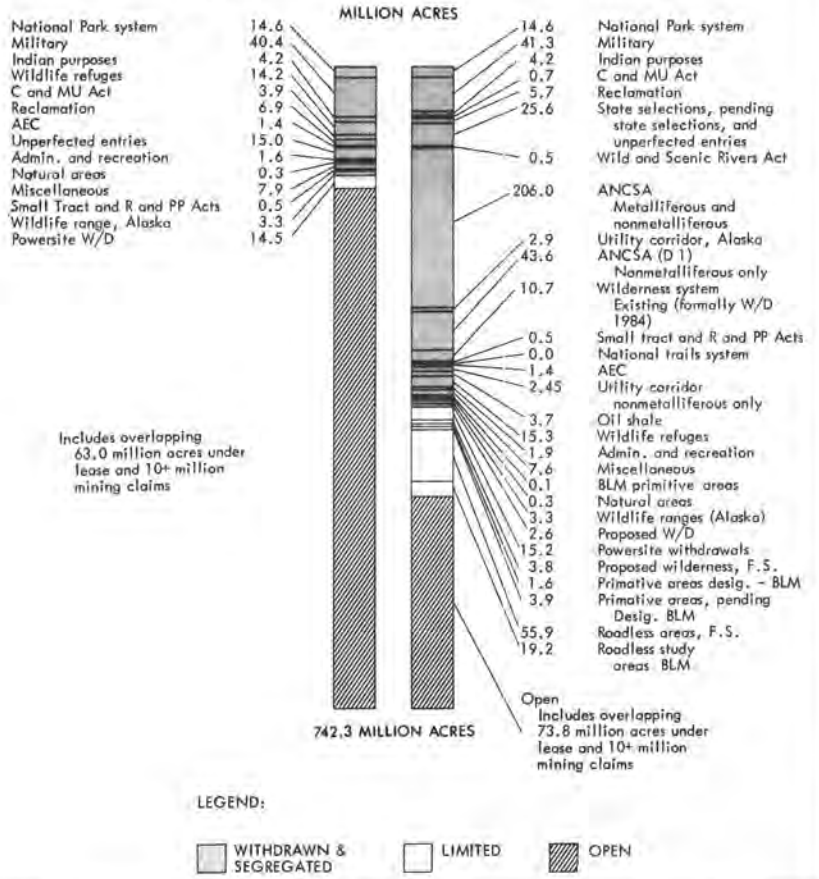
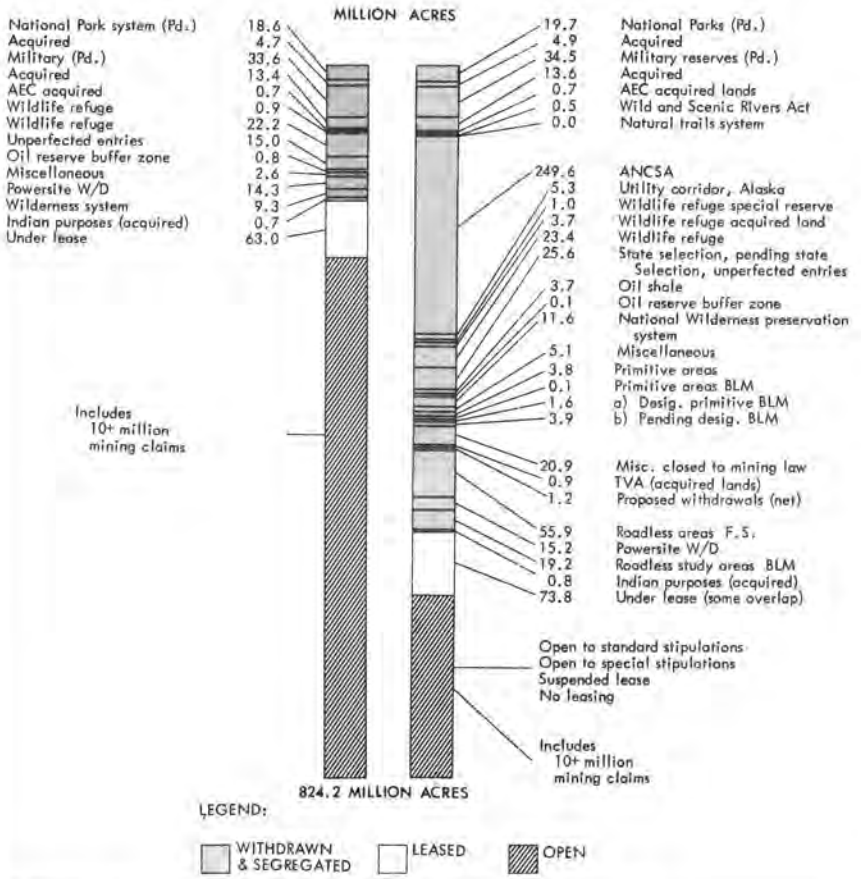


FIGURE 2

PUBLIC LANDS EXCLUDED FROM MINERAL EXPLORATION AND DEVELOPMENT UNDER THE LEASING LAWS



Abbreviations used: ANSCA, Alaskan Native Claims Settlement Act; AEC, Atomic Energy Commision (now ERDA and Nuclear Regulatory Commission); R and PP, Recreation and Public Purposes Act; BLM, Bureau of Land Management; C and MU, Classification and Multiple Use Act; F.S., U.S. Forest Service; and Pd., public domain.

Modified from: Bennethum, Gary; Lee, L. Courtland, 1975, Is our account overdrawn?: Mining Congress Journal, American Mining Congress, Washington, D.C., p. 33-48, September, 1975.

contact our congressmen and the public to slow down or even stop these withdrawals. Keep in mind that if the mining industry dies, so does our country, for our economic health and survival depend to a large extent on domestic mineral production. I would encourage everyone to write to the publisher (American Mining Congress, 100 Ring Bldg., Washington, D. C. 20036) and ask for a reprint of "Is Our Account Overdrawn?"

Ted Livingston

NATION'S COAL OUTPUT TO DOUBLE BY 1985?

According to Dr. Vincent McKelvey, Director of the United States Geological Survey, this nation's coal production will have to increase to twice the present production if coal is to become a more significant energy source.

Coal currently contributes only 18 percent to the overall energy requirements of this nation.

McKelvey noted the need for special measures that will be required to alleviate social and environmental impacts that will arise from mining, processing and using the anticipated increasing volumes of coal over the next ten years.

"A recent survey," McKelvey said, "showed about 300 million tons of annual new capacity under construction, planned, or announced for nine western states to be in operation, nearly all of it involving surface operations. This tonnage—and more as time goes by—will come from a region which not until 1970 produced as much as 30 million tons a year. Such a great expansion of surface mining will increase the physical problems of land disturbance and restoration. Additionally, these problems are complicated by the peculiarities of ownership in a situation where billions of tons of the federal government's leasable coal lies under somebody else's land, and further complicated under circumstances of divided interests and scarcity of water."

Reporting on the status of legislative efforts aimed at avoiding the undesirable effects of coal mining, McKelvey said that one of these attempts—the Interior Department's revision of the Coal Mining Operating Regulations—is now in an advanced stage, having been published in the Federal Register as proposed rule making for public comment on September 5 of this year, and with a Draft Environmental Statement describing its effects released for public review on October 1.

"We foresee mining practices on the federal coal lands that not only embody the latest technology for environmental protection and mineral extraction, but mining operations that will lead the way toward the development of new technology, including technology that will maximize ultimate resource recovery, not only of coal, but of other resources in the same area," McKelvey said.

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