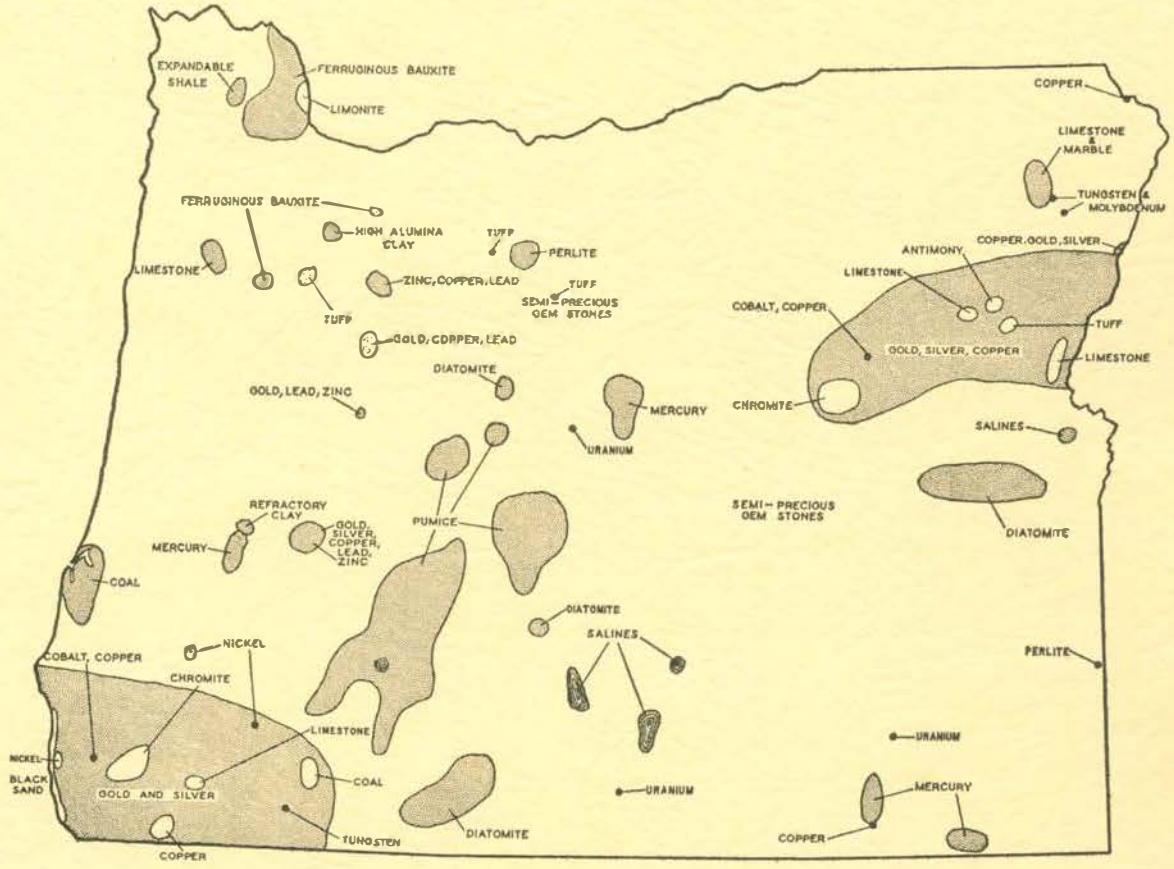
ELEVENTH BIENNIAL REPORT

STATE OF OREGON

Department of Geology and Mineral Industries

1956-1958



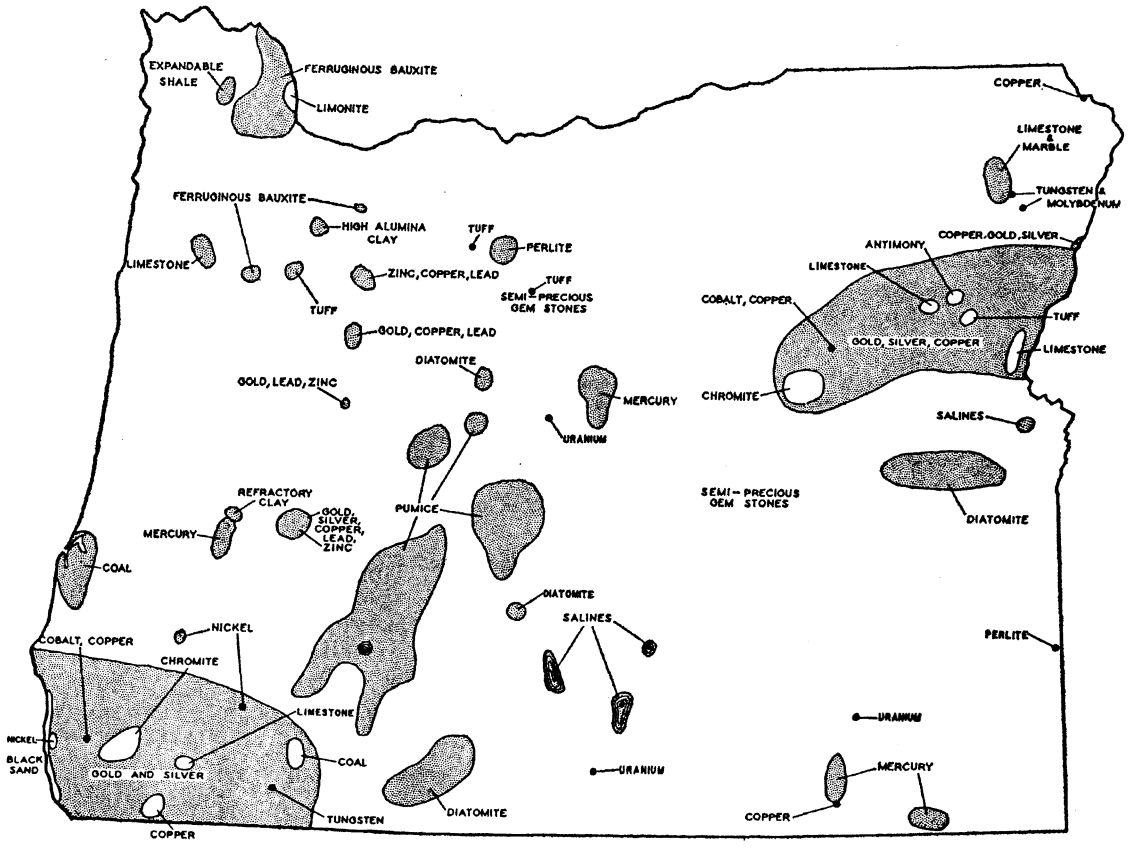
BULLETIN 48

ELEVENTH BIENNIAL REPORT

STATE OF OREGON

Department of Geology and Mineral Industries

1956-1958



BULLETIN 48

ELEVENTH BIENNIAL REPORT

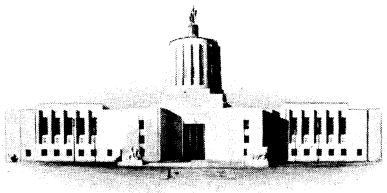
STATE OF OREGON

DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1956---1958

1958

CONTENTS



STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1

To His Excellency
The Governor of the State of Oregon
and to
The Fiftieth Legislative Assembly of the State of Oregon

Sirs:

We submit herewith the Eleventh Biennial Report of the Department of Geology and Mineral Industries, covering activities of the Department for the period from July 1, 1956, to and including June 30, 1958.

Respectfully,

William Kennedy
William Kennedy, Chairman

Les R. Child
Les Child, Member

Nadie Strayer
Nadie Strayer, Member

Portland, Oregon
October 27, 1958

RELATION OF THE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES TO OREGON'S MINERAL INDUSTRY

The Department of Geology and Mineral Industries was established by the 39th Legislative Assembly with Charles H. Martin as Governor. By July 1, 1937, a staff had been organized and operations begun. Previous to this, the State was without a separate mining or geology department, except for the period 1911 to 1923 when a Bureau of Mines was operated in conjunction with the mining school at the State College.

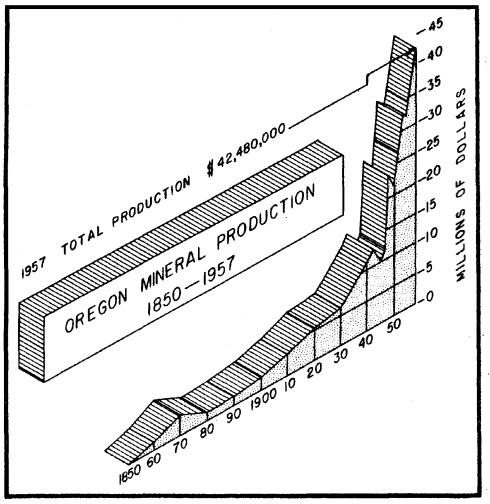
The basic setup of the Department, with head office at Portland and field offices at Grants Pass and Baker, has remained the same as when it was established more than 20 years ago. A few operational changes, however, have been made. The main change was to move the laboratories, which were originally at the field offices, to Portland in order to centralize and better coordinate analytical work. Other changes have included curtailment of ceramic and metallurgical work within the Department and the addition of a petroleum engineer in order to effectively enforce the Oil and Gas Act adopted by the 1953 Legislature.

Since the time when the Department was established, Oregon's mineral industry has undergone many changes. Gold, silver, and copper, the backbone of the industry before World War II, have had negligible production since 1942. Of the nearly 300 gold mines in operation in 1940 only one lode gold mine and a handful of small seasonal placer mines remain. The history of chrome and quicksilver mining has been spotty. In times of national crisis Oregon has contributed important amounts of quicksilver and has been a major domestic source of metallurgical-grade chromite.

Early in the 1940's Oregon was producing an average annual total of nine-thousand 76-pound flasks of mercury from more than 20 mines. By 1945, the Bonanza mine in Douglas County (the nation's largest mercury producer in 1941) was the only major Oregon mine in operation and it finally closed in 1950. Then, as the result of the Korean crisis in 1951, mercury again became critical and mines started to reopen. In 1956 Oregon had four mines producing greater than 100 flasks a month. In late 1957 the price for mercury broke and has since remained uneasy. By mid-1958 two mines (Bonanza and Malheur County's Bretz) were still hanging on but the future was not bright.

Oregon chrome ore is of good grade and the deposits fairly numerous, but chrome mining has had an even more discouraging history than mercury mining due to complete dependance on government purchase. Shortly after World War II not one of Oregon's 30 wartime producing chrome mines was operating. But in 1952, responding to a government incentive purchase program established at the time of the Korean conflict, the miners returned to their properties. By 1956, forty-two mines were operating. Upon filling of the stockpile in May 1958, all of Oregon's chrome mines closed and prospecting stopped. An effort is presently underway by southwestern Oregon chrome producers to establish a cooperative for the purpose of manufacturing local ore into ferrochrome. In this way, it is hoped, domestic ore would compete at the finished-product level rather than with foreign-produced ore.

In spite of the virtual loss of gold, silver, and copper mining early in 1940, and the sporadic production of chrome and mercury over the past 20 years, the value of Oregon's mineral production has increased from $6,609,710 in 1937, when the Department was established, to $42,480,000 in 1957. The yearly increase in this period has been rather constant, with the greatest gains since 1950. Increased production of the building materials, such as sand and gravel, limestone for cement, lime, pumice, cinders, and trim stone, has been responsible for the bulk of the dollar increase. New mines and new products have also made substantial contributions. Outstanding new developments have been the opening of the nation's only nickel mine and smelter at Riddle, Douglas County, in 1953, and the uranium mine and processing plant at Lakeview in 1958. These two operations alone represent a capital investment of more than 40 million dollars and an employment of 650 people.



Although not figured into the value of Oregon's mineral production, but nevertheless a part of the State's mineral industry, the most significant gains in diversification of Oregon's industrial base since 1937 have been in the field of electroprocessing of mineral materials. Communities whose economy has historically been identified with agriculture or timber now depend heavily on employment in plants producing aluminum, silicon, zirconium, hafnium, ferronickel and the ferroalloys, carbide, and glass. Communities in which these plants are located are The Dalles, Troutdale, Portland, Albany, Springfield, and Riddle.

As Oregon's mining and mineral industry has changed and expanded over the years, the Department of Geology and Mineral Industries has been called upon more and more for basic information on mines, mineral resources, geology, and marketing information. Nearly 100 bulletins, maps, short papers, and miscellaneous publications have been issued over the past 22 years, as well as 240 issues of its monthly news bulletin. Since the Department first opened its offices, more than 100,000 people have visited the Portland, Grants Pass, and Baker branches; 200,000 letters have been received, 250,000 letters sent out, and 100,000 mineral determinations and identifications made. Almost twice as much business was done in these categories in the biennial period 1956-58 as there was in the biennial period ten years ago. People both in Oregon and outside the State interested in Oregon's geology and mineral industries depend on and have confidence in the Department to furnish promptly up-to-date factual information. Miners turn to the Department for information and support on mineral legislation at the national level. The layman comes to the Department for answers to the many geological phenomena he finds in the world about him. The Boy Scout and school student come for information on rocks, minerals, fossils, and other geological matters that arouse their curiosity.

For these services the people of the State have paid a total of just over two million dollars since July 1, 1937. Although the Department has but two more technical employees than when it started, the cost of running the Department has increased from $83,537.00 in the 1939-1940 biennium to an estimated $337,452.00 in the 1957-1959 biennium. That this has been a good investment is proved not only by the services enumerated above but by the estimate that industry has spent more than 50 million dollars in Oregon on mineral and industrial developments directly attributable to investigations and publications of the Department of Geology and Mineral Industries. The major projects include the work and investments of the companies exploring the laterite deposits of northwestern Oregon, the nickel deposits of southwestern Oregon, the black sands of the coast, the coal of Coos County, the chrome deposits of the State, and the expandable shale of the northern Willamette Valley.

The work of the Department is far from completed. Aside from the continuing value of a central source of information on Oregon's geology and mineral industry and the many subsidiary services of the Department, the real need for the Department's services is in the geological and mineral resource work still to be performed. The most basic of all studies, the State Geologic Map, is only half completed and less than 20 percent of the State has been adequately geologically mapped. Mineral resource studies have been completed on less than one-third of the commodities that need to be reported on, and the rise in importance of new metals requires a continual re-examination of mineralized areas. As industrial centers increase in number, studies will have to be made to determine the local availability of construction materials. Engineering studies, especially those concerned with landslides, remain to be made in many areas. Investigations of the industrial or nonmetallic minerals must continue, as the value of these materials is dependent on ever-changing transportation costs, markets, extraction and processing methods, and availability of other raw materials, such as natural gas. Until definitely proved otherwise, certain areas in Oregon must be considered as having petroleum or natural gas possibilities. To determine this will require the most detailed geological mapping techniques combined with all the modern tools used in the search for oil. It will also require considerable drilling which by law must be supervised by the Department. These and many more investigations and researches will demand that a responsible State maintain at an adequate level the Department of Geology and Mineral Industries for many years to come.

DUTIES OF THE DEPARTMENT
(Chapter 516, ORS)

Conduct geological and mineral resource studies.

Carry out economic studies pertaining to utilization of mineral raw materials.

Cooperate with Federal and other agencies in studies of value to the State.

Serve as a bureau of mineral and geological information, compile and keep up-to-date a mines catalog, prepare and publish reports of investigations, mineral statistics, etc.

Conduct a State geological survey.

Collect a mining and geological library.

Collect specimens and develop a museum of mineral and geological specimens, maps, and other objects representative of mineral industry activities.

Make qualitative mineral determinations.

Study minerals and ores as well as processes for improved ore treatment.

Make quantitative determinations of ores and minerals.

Make spectrographic analyses.

Administer act regulating drilling, prospecting for, production, and conservation of natural gas and oil (Chapter 520 ORS).

Organization and Personnel

The law establishing the Department, Chapter 516, Oregon Revised Statutes, describes in a broad way its organization. General charge and control of the Department is made the responsibility of a three-member Governing Board with direct supervision and superintendence of the Department by a Director.

Governing Board

Governing Board members must be Oregon citizens. They receive appointments for 4-year terms from the Governor, subject to approval by the State Senate or Mining Board Interim Committee. Members serve without compensation but are reimbursed for actual expenses incurred in the performance of official duties. Board meetings must be held at least four times a year. Meetings during the biennium were held as follows:

RESPONSIBILITIES OF THE BOARD
(Chapter 516 ORS)

Have general charge and control of the Department.

Have possession, charge, and control of all publications, equipment, and property of the Department.

Select Director of the Department.

Cause to be published reports of investigations and surveys.

Cause to be published a biennial report of Department activities.

Administer and enforce Oil and Natural Gas Conservation Law (Chapter 520 ORS).

May make contracts with Federal and State agencies.

May receive gifts and legacies and make use of them.

August 17-18, 1956 - Baker

September 24, 1956 - Portland

November 19-20, 1956 - Grants Pass

February 8-9, 1957 - Portland

May 1, 1957 - Portland

July 11, 1957 - Portland

December 17, 1957 - Portland

February 13, 1958 - Portland

March 21-22, 1958 - Grants Pass

May 23, 1958 - Baker

Chairman of the Board is selected by the members, and the Director of the Department, who meets with the Board, generally serves as Secretary ex-officio. Members of the Board and governors appointing them since the beginning of the Department in 1937 are as follows:

Member	Term	Governors Appointing
W. H. Strayer	1937 - 1946	Martin, Sprague, Snell
Albert Burch	1937 - 1943	Martin, Sprague
E. B. MacNaughton	1937 - 1943	Martin, Sprague
	1946 - 1949	Snell
S. H. Williston	1943 - 1947	Snell
Niel R. Allen	1943 - 1957	Snell, Hall, McKay, Smith
H. E. Hendryx	1947 - 1953	Snell, McKay
Mason L. Bingham	1949 - 1958	McKay, Patterson, Holmes
Autin Dunn	1953 - 1957	Patterson
Clint P. Haight, Jr.	1957	Holmes
Les R. Child*	1957 - 1960	Holmes
Nadie Strayer*	1957 - 1959	Holmes
William Kennedy*	1958 - 1961	Holmes

* Present members of Board.

Director

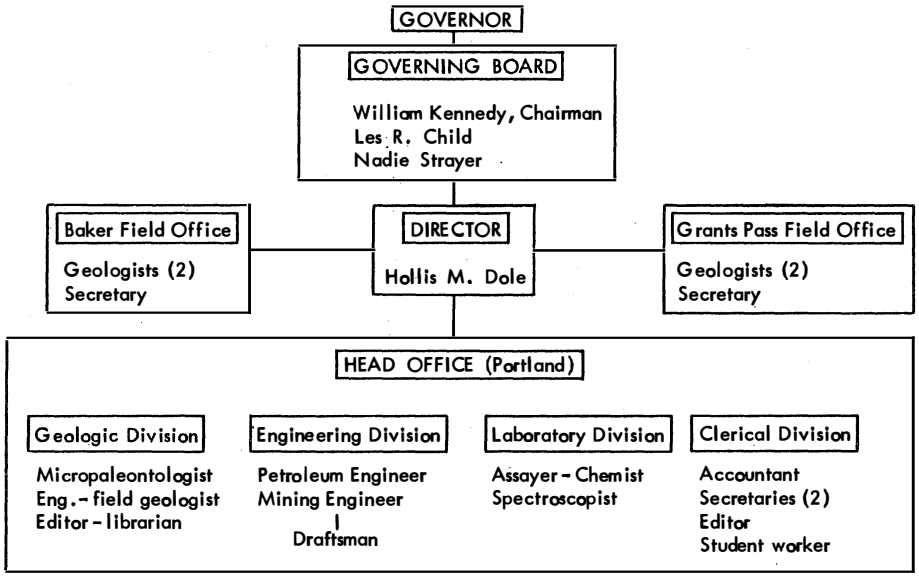
The Director of the Department is appointed by the Governing Board. The appointment may be for a stated period of time or subject to termination. Salary of the Director is set by the Board within a range determined by the Legislature. Qualifications for the Director have been established by law as ". . . either a geologist with a broad background of mining and engineering experience or a mining engineer with a broad background of geological experience, whose additional qualifications shall be an experience record which includes five years in charge of important work in either mining engineering, geology, or both, and a minimum total experience of ten years in these fields."

The Director is responsible for the work of the Department in the field and in the office. Progress reports, plans, and budgets are presented by him to the Governing Board at each meeting and it is his responsibility to see that results of investigations are promptly published. The Director is authorized to employ the staff necessary for the execution of his plans and the operations of the Department.

The law establishing the Department prohibits the Director or any member of the staff from holding or having an interest or dealing in any producing or prospective mineral property of any kind in this State, including oil and gas. It also prohibits the Director or staff from doing private consulting work if the service is concerned with mining, geology, or any mineral industry in the State.

The first Director of the Department was Earl K. Nixon. Under Mr. Nixon's direction a staff was obtained and the work of the Department began. Fay W. Libby followed Mr. Nixon in July 1944 and served until November 1954. Hollis M. Dole is the present Director and has served since Mr. Libbey's retirement.

ORGANIZATIONAL CHART
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES



Staff

The head office of the Department is in the State Office Building, Portland. Field offices are at 239 S.E. "H" Street, Grants Pass, and 2033 First Street, Baker. The assaying, chemical, and spectrographic laboratories and the accounting functions are centralized in the Portland office. The library and museum are also located at the Portland office, with rock and mineral displays and literature of local interest in each of the field offices. Field offices are maintained to enable the Department to give better, faster, and more economical field inspection service and to make other services of the Department more readily available to the miners and prospectors of the two main hardrock mining areas of the State.

GOVERNING BOARD

William Kennedy, Chairman, Portland
Les R. Child . . . . . Grants Pass
Nadie Strayer . . . . . Baker

The Department's duties are separated into four divisions: geologic, engineering, laboratory, and clerical. The geologic division makes mineral resource studies, petrographic examinations of rocks and minerals, field examinations of prospects, geologic and engineering studies, stratigraphic studies, foraminiferal research, and does geologic mapping at both the State Geologic Map and quadrangle map scale. The engineering division is responsible for the Department's purchases and inventory, investigations under the Oil and Gas Act, compilation of data on Oregon's mineral industry, drafting for illustrations, and resource studies. The laboratory division has chemical, assaying, spectrographic, radiometric, and differential thermal analysis equipment for making qualitative and quantitative determinations on Oregon rocks and minerals. The spectrographic laboratory also does work for other State agencies, private laboratories, and industrial firms on many kinds of material as provided for under ORS 516.060. Personnel in all three divisions make rock and mineral identifications, consult with callers at the office, handle correspondence, and make public appearances in behalf of the Department. The clerical division performs the necessary editing, stenographic, typing, accounting, and receptionist duties of the Department.

DEPARTMENT PERSONNEL

Hollis M. Dole, Director
Howard C. Brooks, Geologist (Baker)
*Michael Brown, Student worker
Mark P. Christianson, Draftsman
*Robert Craig, Laboratory assistant
*Irving G. Ewen, Student worker
L. L. Hoagland, Assayer-chemist
Arline M. Jacques, Secretary (Grants Pass)
Loris M. Killian, Secretary
Ralph S. Mason, Mining engineer
Thomas C. Matthews, Spectroscopist
Vernon C. Newton, Jr., Petroleum engineer
Lillian F. Owen, Editor
Norman V. Peterson, Geologist (Grants Pass)
Len Ramp, Geologist (Grants Pass)
*Marjorie M. Reagan, Secretary (Baker)
June A. Roberts, Secretary
Herbert G. Schlicker, Geologist
Margaret L. Steere, Geologist
R. E. Stewart, Geologist
Norman S. Wagner, Geologist (Baker)
R. P. Zobl, Accountant

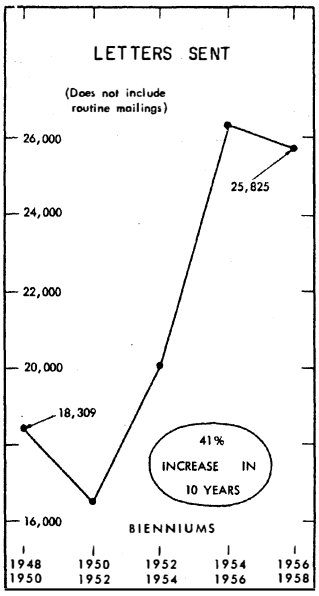
*Part-time employees.

The number of full-time technical employees within the Department has varied from eight (1938 to 1940) to thirteen (1943). The average number employed over the past 22 years is ten. This compares with a present staff of eleven and a staff of nine when the Department was organized. The accompanying chart shows the distribution of the staff and the technical skills the Department has had since its beginning (see p.8). As will be noted, the Portland office has had fewer field geologists during the past biennium than at any time in its history. This has worked a serious hardship on the Department as there has been insufficient staff to handle the office duties, field work, and research

required by statute. Insufficient staff has also slowed the publication schedule as office services demand prompt action, leaving less time for preparation of manuscripts. Increasing administrative detail has also required more attention from the technical employees as well as requiring a greater number of employees within the clerical division.

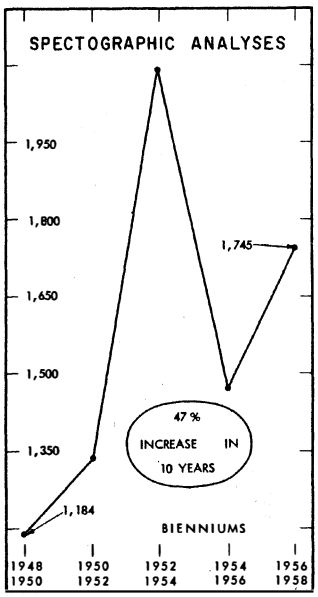
TECHNICAL STAFF DISTRIBUTION

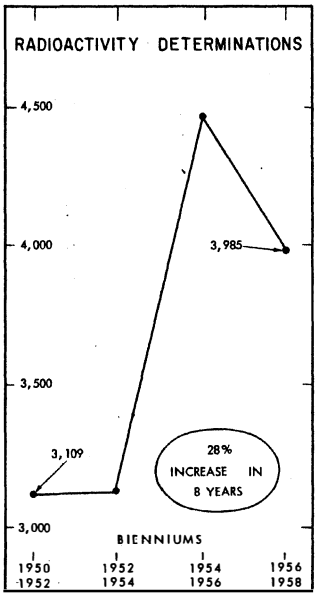
	PORTLAND										GRANTS PASS		BAKER		
Year	Laboratory Division				Engineering Division		Geologic Division				Field Office		Field Office		Total
Dept. estab. 1937	Spectroscopist	Assayer - Chemist	Ceramist	Metallurgist	Petroleum Engineer	Mining Engineer	Micropaleontologist	Editor - Librarian	Field Geologist		Assayer	Field Geologist	Assayer	Field Geologist	Technical Staff
1937						2			3		1	1	1	1	9
1938						2			2		1	1	1	1	8
1939				½		2			1½		1	1	1	1	8
1940				1		1			2		1	1	1	1	8
1941	1			1		1		1	3		1	1	1	1	11
1942	1					1		1	4		1	1	1	1	11
1943	1	1	1			2		1	4		1	1		1	13
1944	1	1				2	1	1	3			1		1	11
1945	1	1				1	1	1	3			1		1	10
1946	1	1				1	1		3			1		1	9
1947	1	1				1	1	1	3			1		1	10
1948	1	1	½			1	1	1	2			1		1	9½
1949	1	1	½			1	1	1	2			1		1	9½
1950	1	1	½			1	1	1	2			1		1	9½
1951	1	1				1	1	1	1½			1		1	8½
1952	1	1				1	1	1	2½			1		1	9½
1953	1	1				1	1	1	2			1½		1	9½
1954	1	1				1	1	1	2			2		1	10
1955	1	1				1	1	1	2			2		1	10
1956	1	1				1	1	1	2			2		2	11
1957	1	1			½	1	1	1	1			2		2	10½
1958	1	1			1	1	1	1	1			2		2	11

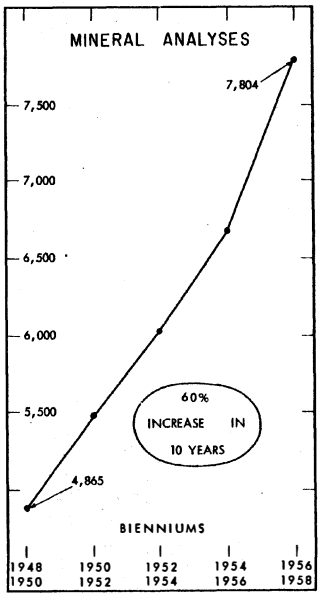


The Department serves industry

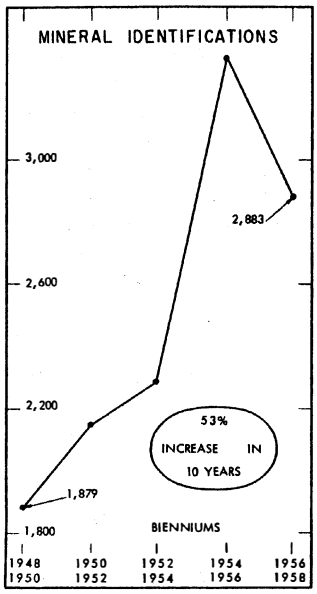
The Department is strongly conscious of its responsibility to broaden Oregon's economic base. Mineral resource studies and areas for detailed geologic mapping are chosen in order to call the attention of industry to a mineral resource or a favorable geologic environment. Mines catalogs are compiled in order to answer inquiries of companies investigating location and occurrence of mineral commodities. Each geologist and engineer within the Department is trained to be an expert on certain minerals and areas in order to furnish information quickly and accurately to investigating engineers. Of the 25,828 letters written during the biennium, a great many were concerned with inquiries from industry. The subscription list of The Ore.-Bin, the Department's monthly news publication, reveals that many major mining and oil companies of the country look to the Department for current information on Oregon. A large percentage of the Department's publications are purchased by industry, and the Department's library is used extensively for research. The Department cooperates with the Department of Planning and Development in answering responses to the brochure on Oregon's mineral potential which was published by Planning and Development.







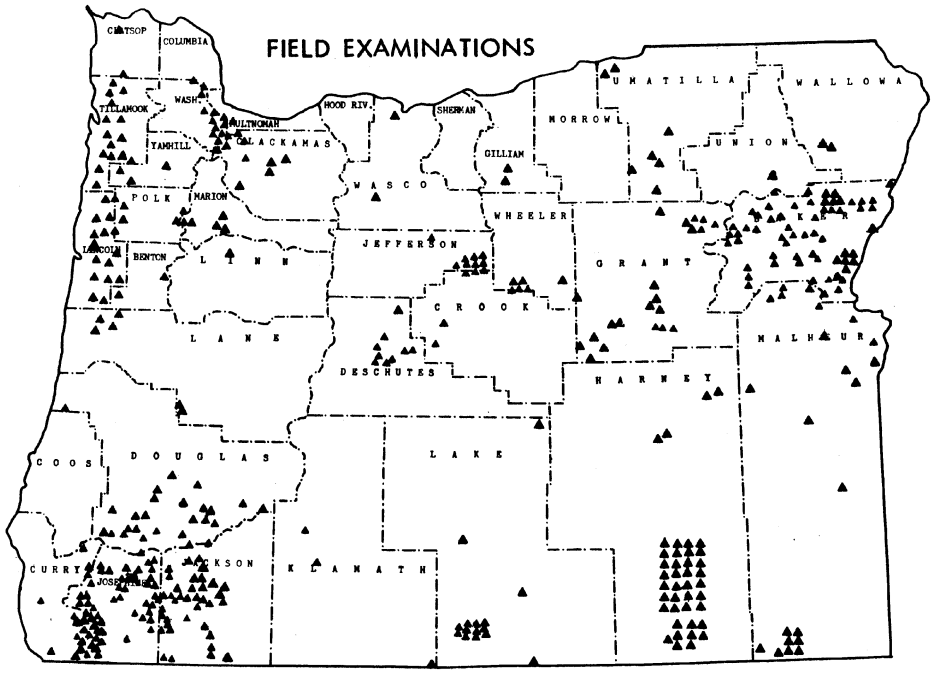
The Department serves the prospector and small mine owner



The prospector and small mine owner of the State looks to the Department of Geology and Mineral Industries for help in almost all fields of his activity. During the biennium the laboratories made 7,804 mineral analyses and 2,883 mineral identifications, most of which were for prospectors. In addition, many field examinations and conferences (see charts) were conducted by members of the staff. The Director appeared before the U.S. Senate Committee on Interior and Insular Affairs twice early in 1958 in behalf of the chrome miners and prospectors. Assistance was given on many legislative items on the national level.

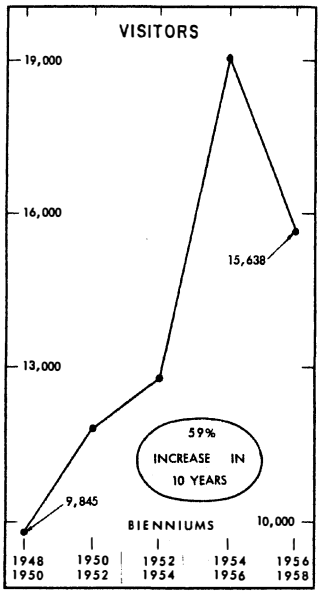
The departments of Planning and Development and Geology and Mineral Industries cooperatively financed a study on the feasibility of a ferrochrome plant utilizing locally produced chrome. Following this study, arrangements were made with the U.S. Bureau of Mines Electrodevelopment Laboratory at Albany for pilot tests on ore from southwestern Oregon and northern California.

A primary purpose of The Ore.-Bin is to keep the prospector and small miner informed of new publications, legislation, and mineral markets. Other Department publications are issued at a small charge in order to be made available to all.



The Department serves the general public

Great public interest in Oregon's geology and mineral industry and in geology and mining in general is shown by the number of requests made to the Department for talks to school children and adult groups and for conducting field trips. A list of the services given in the biennium is shown below. These services are the responsibilities of the regular staff members as there is no separate education or speakers bureau in the Department. A file of geologic and mineral industry photographs is continually being expanded. The Department welcomes the opportunity to appear before groups as it feels a better understanding of Oregon's mineral potential by the public is necessary if the State's resources are to be wisely used. The Department also feels an educational responsibility, for a sign of an enlightened society is a better understanding of its surroundings.



A public service allied to the lectures and field trips is the preparation and distribution of mineral sets. Three sizes of sets are prepared, one of which is distributed on a loan basis to Oregon schools and the other two are for sale. The loan set is a collection of 60 typical rocks and minerals from Oregon. Ten sets are available and more are in preparation. These sets are available to science classes of grade and high schools. A collection of 20 Oregon rocks and minerals is assembled in boxes for sale at $1.50 per set plus postage. A small 6-mineral set is prepared for Boy Scouts and school children and sells for 25 cents. Included with all sets is a description of the material. The number of sets sold and the money received and distribution of the loan sets is given below. Material to be placed in the sets is collected by the staff members in the course of their field duties; a student worker is employed to assemble the sets.

October 1957 was declared "Geology Month" by the Boy Scouts of America. It was intended to be the "Greatest Show on Earth" and the Department of Geology and Mineral Industries cooperated with the Boy Scouts of America so that the slogan would be carried out in Oregon. Not only did the Department staff members take a very active part in the program but the Department acted as a central coordinating agency for the entire State, arranging for lectures, field trips, mine inspections, and the like for the Scouts. Agate and mineral societies, mines and mining plants cooperated without exception. In addition, members of the staff give instruction for the Boy Scout geology merit badge as well as 4-H Club and Campfire Girl classes.

SERVICES GIVEN TO GROUPS

	Schools	Service groups	Professional societies	Radio TV	4-H Campfire Boy Scout	Other	Total
Talks	21	18	9	10	19	31	108
Field trips	13	---	---	---	3	3	19
Office tours	5	---	---	---	5	---	10

MISCELLANEOUS SERVICES

Mineral Sets Sold During Biennium

20- and 30-specimen sets	290
6-specimen sets	129

Special sets of 60 rocks and minerals were loaned to 24 schools during the Biennium

Letters From Students

Requesting geologic and mineral-resource information	658
Requesting minerals	525

The Department serves other agencies

The Department, in its capacity as the State organization responsible for geological and mineral resource information and studies, is called upon by many governmental agencies and civic groups for technical information. Generally the Department makes no charge for its services but if the request involves considerable time or expense, provisions are made in the Department's enabling act to charge the actual cost. Work through the spectrographic laboratory must be on a fee basis. Oregon Revised Statutes 516.060 requires that spectrographic determinations shall be made at the request of any department, institution, or other agency of the State, without any charge in excess of the actual cost. Other than spectrographic work, no charge was made by the Department this biennium. Agencies served and services performed during the period covered by this report are as follows:

State Agencies Served

Board of Health - 22 petrographic analyses.

Board of Higher Education - 13 field trips for geology students at Oregon State College, University of Oregon, and Portland State College.

Crime Detection Laboratory - 103 spectrographic analyses.

Game Commission - 5 field investigations connected with engineering studies.

Land Board - 2 field investigations, information on mineral characteristics of land, information on leasing including the Bear Creek Unit lease.

Planning and Development - technical adviser on preparation of mineral resource brochure, answered mineral inquiries addressed to Planning and Development.

Sanitary Authority - 1 field study on disposal of sewage.

Water Resources Board - information on Snake River study.

Other State agencies - 28 spectrographic analyses.

Participation in Conservation Week.

Counties and Cities Served

Baker County School Board - put on 2-day teachers' workshop.

Grant County Planning Board - furnished information on placer mining laws in various states.

Multnomah County - landslide studies.

Counties and Cities Served (cont.)

City of Portland - geologic study of Bull Run water shed.

City of Portland Police Laboratory - 58 spectrographic analyses.

Port of Umatilla - field investigation of sands.

Chambers of Commerce:

Baker - mineral resource information
Bend - effluent disposal study
Brookings - report on mineral resources of Curry County
Roseburg - geologic investigation and chemical analyses of limestones near Roseburg

Federal Agencies Served

Atomic Energy Commission - furnished rock and mineral samples on several occasions for waste-disposal studies.

Bureau of Mines - collection of mineral statistics, obtained samples of bauxite and carbonaceous shale, supplied information and field studies on mercury, manganese, and sulphur.

Bureau of Reclamation - dam site studies.

Forest Service - geologic and landslide studies in Mt. Hood National Forest.

Soil Conservation Service - use of limestone for soil beneficiation.

Miscellaneous

Smithsonian Institution - geologic studies in Snake River Canyon.

Various scientific societies - Geological Society of America (compiled geologic map of Oregon); American Association of Petroleum Geologists (compiled basement rock map of Oregon); participated in meetings of American Institute of Mining, Metallurgical and Petroleum Engineers; Oregon Academy of Science; and American Mining Congress.

The Department administers the Oil and Gas Conservation Act

The Department issued 14 drilling permits and one deepening permit during the biennial period dated July 1, 1956, to July 1, 1958. No commercial discoveries of oil or gas were made during this period.

Twelve oil tests were abandoned over the two-year period covered in this report. As of July 1, 1958, abandonment was pending on six oil tests, and operations were suspended on three others. Three oil tests were being drilled at the close of the biennium.

The 1953 Oregon Legislature enacted a new oil and gas conservation law, Chapter 520 Oregon Revised Statutes (Chapter 667, Oregon Laws 1953). This law directs that its administration be by the Governing Board of the Department of Geology and Mineral Industries, and according to Section 520.095 ORS the Board is directed to establish reasonable rules and regulations for the guidance of oil and gas operators, a public hearing to be held before revised or new rules are adopted. The Board received valuable advice through the Interstate Oil Compact Commission, utilizing the experience of oil-producing states. The main purpose for revising the Oregon oil and gas law was to provide proper regulations for preventing waste of the State's natural resources.

Oil and Gas Business July 1956 to July 1958	
Abandonment plugs witnessed	9
Drilling site inspections	42
Oil and gas, field investigations . . .	18
Oil and gas letters, general	147
Oil and gas letters, administrative . .	317
Oil and gas visitors	289

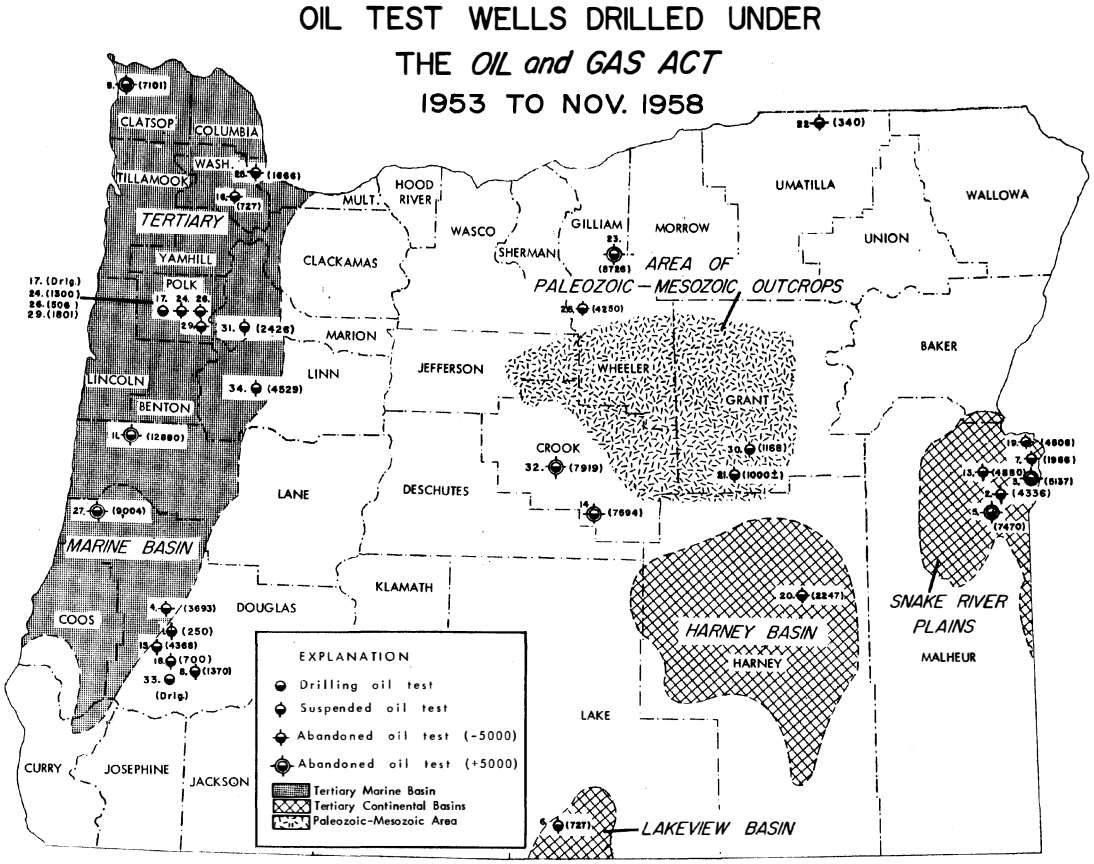
Since the passing of the Oil and Gas Act in 1953, a total of 34 permits has been issued. Two revisions have been made to the oil and gas law since rules were adopted; one to increase the drilling bond from $2000 to $4000 and the other to make abandonment plugging of oil-test holes mandatory.

The Interstate Oil Compact Commission acknowledged Oregon's adoption of an oil and gas conservation law, and Oregon was accepted as an associate member July 7, 1954.

In September 1957 a petroleum engineer was added to the Department staff to help with the administration of oil and gas business and to assemble exploration data for public use. Oil files have been assembled in fireproof files, and confidential oil-exploration records placed under lock and key awaiting expiration of the two-year holding period. The Department now has complete files on oil tests drilled in Oregon as well as records of all deep water wells. A system has been established by which individuals may obtain reproductions of electric logs or well logs upon request at cost. Cores and ditch cuttings saved from oil tests drilled in Oregon are being stored at the warehouse in Hillsboro. Additional shelves are being constructed to take care of new samples and a method is being devised for cataloging the samples for quick reference. A dry hole map of Eastern Oregon was completed in July 1958 showing the current status of all oil-test holes drilled in that region. A similar map is being prepared for Western Oregon.

Statistics on the accompanying chart indicate the amount of oil and gas business transacted by the Department and its two branch offices from July 1, 1956, to July 1, 1958. Not included are the more than 60 requests for information which required varying amounts of research. The heading "Field investigations" refers to studies made in connection with reported oil seeps, occurrences of gas, and collection of data on old oil-test drilling.

Twenty-one companies were represented by individuals visiting the Department offices; at least ten consultants inquired concerning oil exploration in Oregon and most of them made use of material published by the Department. The Department maintained contact with oil activity in the Northwest through oil-company scouts and sent representatives to meetings of the Northwest Geological Society, a group composed mostly of oil geologists who meet frequently in Tacoma, Washington.



OIL AND GAS DRILLING PERMITS
ISSUED SINCE ADOPTION OF THE OIL AND GAS ACT

Permit No.	Date issued	Company	Lease Name and County	Location	Status
No number	Sept. 4, 1952	Northwest Oils, Inc. Prineville, Oregon	Morrow Bros. No. 1 (Jefferson County)	700' N. of S. line 900' E. of W. line SW¼ sec. 18 T. 12 S., R. 15 E.	Suspension extended to Dec. 8, 1958.
(Drilling began before oil and gas regulations were adopted)					
1	March 22, 1954	W. F. Kernin Box 855 Roseburg, Oregon	D. Coon No. 1 (Douglas County)	900' S. of N. line 900' W. of E. line SE¼ sec. 30 T. 28 S., R. 6 W.	Suspension extended to May 15, 1959.
* 2	March 26, 1954	Roderick A. Stamey 311 Rusk Bldg. Houston, Texas	G. B. Russell No. 1 (Malheur County)	330' S. of N. line 330' E. of W. line NW¼ sec. 14 T. 19 S., R. 44 E.	Abandoned Sept. 30, 1954.
* 3	Sept. 2, 1954	H. K. Riddle P.O. Box 537 Ontario, Oregon	Kiesel Estate No. 1 (Malheur County)	1260' N. of S. line 1370' E. of W. line SW¼ sec. 8 T. 19 S., R. 47 E.	Abandoned May 28, 1955.
* 4	Oct. 4, 1954	Oil Developers, Inc. Roseburg, Oregon	Scott No. 1 (Douglas County)	SW¼ SW¼ sec. 5 T. 27 S., R. 6 W.	Abandoned Jan. 4, 1955.
* 5	Nov. 15, 1954	El Paso Natural Gas Company 303 Tribune Bldg. Salt Lake City, Utah	Federal No. 1 (Malheur County)	360' S. of N. line 550' W. of E. line NE¼ sec. 5 T. 20 S., R. 44 E.	Abandoned Feb. 1, 1955.
6	Feb. 16, 1955	C. A. Stone & Assoc. P.O. Box 1189 Lakeview, Oregon	W. A. Anderson No. 3 (Lake County)	2290' N. of S. line 20' E. of W. line, SW¼ sec. 20 T. 39 S., R. 19 E.	Unlawfully abandoned. Pending action.
(No samples available)					
7	Feb. 24, 1955	Oroco Oil & Gas Co. Payette, Idaho	Bolles No. 1 (Malheur County)	660' S. of N. line 400' W. of E. line NW¼ sec. 15 T. 17 S., R. 47 E.	Abandoned April 19, 1955.
(No samples available)					
8	March 29, 1955	Riddle Oil & Gas Producers Riddle, Oregon	Dayton No. 1 (Douglas County)	960' N. of S. line 1040' E. of W. line SW¼ sec. 34 T. 30 S., R. 6 W.	Suspension extended to Jan. 1, 1959.
* 9	April 1, 1955	Standard Oil Co. of California 557 Roy Street Seattle, Washington	Hoagland Unit No. 2 (Clatsop County)	311' N. and 499' E. of S¼ cor. sec. 11 T. 7 N., R. 10 W.	Abandoned July 7, 1955.
10	June 6, 1955	R. N. Ranger 1007 Broadway Bldg. Portland, Oregon	Eastern Oregon Land Co. No. 1 (Malheur County)	660' N. of S. line 1320' E. of W. line SW¼ sec. 15 T. 16 S., R. 44 E.	Never drilled. Bond canceled.

* The Department has ditch samples on these wells.

OIL AND GAS DRILLING PERMITS (cont.)

Permit No.	Date issued	Company	Lease Name and County	Location	Status
* 11	June 2, 1955	Sinclair Oil & Gas Co. 1010 Broadway Bldg. Portland, Oregon	Federal Mapleton No. 1 (Lane County)	1629' N. and 246' W. of SE cor. sec. 12 T. 16 S., R. 10 W.	Abandoned Feb. 22, 1956.
12	July 22, 1955	Oroco Oil & Gas Co. 2 N. 8th Payette, Idaho	J.D. Lane No. 1 (Malheur County)	1320' N. of S. line 2640' E. of W. line SW¼ sec. 16 T. 18 S., R. 47 E.	Never drilled. Bond canceled.
* 13	July 26, 1955	Sinclair Oil & Gas Co. 1010 Broadway Bldg. Portland, Oregon	Eastern Oregon Land Co. No. 1 (Malheur County)	660' N. of S. line 1980' E. of W. line SW¼ sec. 15 T. 16 S., R. 44 E.	Abandoned Sept. 29, 1955.
* 14	July 28, 1955	Standard Oil Co. of California 557 Roy Street Seattle, Washington	Pexco No. 1 (Crook County)	3535' N. of S. line 3006' E. of W. line NE¼ sec. 36 T. 20 S., R. 20 E.	Abandoned Dec. 30, 1955.
* 15	Aug. 2, 1955	Uranium Oil & Gas Co. P. O. Box 924 Klamath Falls, Oregon	Ziedrich No. 1 (Douglas County)	1570' S. and 238'W. of N¼ cor. NW¼ sec. 16 T. 29 S., R. 8 W.	Unlawfully abandoned. Pending action.
* 16	Aug. 15, 1955	Oregon Explorations P. O. Box 401 Hillsboro, Oregon	C. Wohler No. 1 (Washington County)	771.2' S. of N. line 1650' W. of E. line NE¼ sec. 11 T. 1 S., R. 3 W.	Abandoned Oct. 25, 1955.
* 17	Oct. 24, 1955	Miriam Oil Company 126 W. 11th McMinnville, Oregon	Elliott No. 1 (Polk County)	395' S. of N. line 1390' E. of W. line SW¼ sec. 9 T. 8 S., R. 5 W.	Abandoned Dec. 19, 1955.
17 (Deepening)	June 12, 1958	Miriam Oil Company	Elliott No. 1	" " "	Operations to begin on Dec. 1, 1958.
18	April 30, 1956	Riddle Oil & Gas Producers Riddle, Oregon	Wollenberg No. 1 (Douglas County)	601' S. of N. line 34.9' W. of E. line NE¼ sec. 28 T. 30 S., R. 6 W.	Suspension pending.
* 19	Sept. 25, 1956	Oroco Oil & Gas Co. 2 North 8th Payette, Idaho	McBride No. 1 (Malheur County)	1566' N. of S. line 1419' W. of E. line sec. 19 T. 16 S., R. 46 E.	Abandoned Feb. 1, 1957.
* 20	Oct. 5, 1956	Oroco Oil & Gas Co. 2 North 8th Payette, Idaho	Portland Co. No. 1 (Harney County)	1287' S. of N. line 1254' E. of W. line sec. 18 T. 24 S., R. 33 E.	Abandoned Dec. 2, 1956.
21 (No samples available)	Sept. 25, 1956	Seneca Oil & Gas Co. John Day, Oregon	Lemmons No. 1 (Grant County)	NW¼ NE¼ sec. 18 T. 17 S., R. 29 E.	Abandoned Aug. 1957
* 22	Nov. 20, 1956	Big Red Uranium Co. 508 Main St. Vancouver, Wash.	Richartz No. 1 (Umatilla County)	4950' W. and 2831'N. from SE cor. sec. 24 T. 6 N., R. 34 E.	Abandonment pending Jan. 1, 1958.

* The Department has ditch samples on these wells.

OIL AND GAS DRILLING PERMITS (cont.)

Permit No.	Date issued	Company	Lease Name and County	Location	Status
*23	Dec. 18, 1956	Standard Oil Co. 557 Roy Street Seattle, Washington	Kirkpatrick No. 1 (Gilliam County)	4319' W. and 2909' S. from NE cor. sec. 6 T. 4 S., R. 21 E.	Abandoned July 12, 1957.
*24	Jan. 19, 1957	Miriam Oil Co. 126 W. 11th Street McMinnville, Oregon	Bliven No. 1 (Polk County)	937' E. and 1300' S. from W¼ cor. sec. 11 T. 8 S., R. 5 W.	Abandoned June 1, 1957.
*25	May 10, 1957	Sunray Mid-Continent Oil Co. 714 W. Olympic Blvd. Los Angeles, Calif.	Kappler No. 1 (Multnomah County)	431' E. and 1901' S. from NW cor. sec. 12 T. 2 N., R. 2 W.	Abandoned Aug. 7, 1957.
*26	May 22, 1957	Miriam Oil Co 126 W. 11th Street McMinnville, Oregon	Bliven No. 2 (Polk County)	SE¼ SE¼ sec. 10 T. 8 S., R. 5 W.	Abandoned June 22, 1957.
*27	May 20, 1957	General Petroleum Co. P.O. Box 1277 Taft, California	Long Bell No. 1 (Douglas County)	1640' E. and 1244' N. from SW cor. sec. 27 T. 20 S., R. 10 W.	Abandoned Nov. 8, 1957.
*28	July 15, 1957	Oregon Petroleum Corp. Elliott Bldg. Menlo Park, Calif.	Clarno No. 1 (Wheeler County)	73' W. and 711' N. from SE cor. sec. 27 T. 7 S., R. 19 E.	Abandoned Oct. 4, 1957.
*29	Oct. 29, 1957	Miriam Oil Co. 126 W. 11th Street McMinnville, Oregon	Bliven No. 3 (Polk County)	SE¼ sec. 10 T. 8 S., R. 5 W.	Abandoned Jan. 30, 1958.
*30	Nov. 27, 1957	Sunnyvale Oil Co., Inc. 520 S. Murphy Avenue Sunnyvale, Calif. Mitchell Pusateri	Mitchell No. 1 (Grant County)	SE¼ SE¼ sec. 14 T. 16 S., R. 29 E.	Suspension to Jan. 31, 1959.
31	March 4, 1958	V. V. Erntson	Schermacher No. 1 (Marion County)	SE¼ sec. 22, T. 9 S., R. 2 W.	Suspended July 25, 1958.
*32	April 4, 1958	Sunray Mid-Continent Oil Co. -Standard Oil Co.	Bear Creek Unit No. 1 (Crook County)	1525' N. of S. line 1038' W. of E. line SE¼ sec. 30 T. 17 S., R. 19 E.	Abandoned Aug. 29, 1958.
33	July 25, 1958	Riddle Gas & Oil Producers, Oregon Ltd.	Aikins No. 1 (Douglas County)	1647' N. of S. line 555' W. of E. line SE¼ sec. 27 T. 30 S., R. 6 W.	Drilling.
34	Oct. 6, 1958	Linn County Oil Development Co.	Barr No. 1 (Linn County)	SE¼ sec. 31 T. 11 S., R. 1 W.	Drilling.

* The Department has ditch samples from these wells.

FINANCIAL STATEMENT

The Department's activities are supported by money appropriated by the Legislature out of the State's general fund. Appropriations received by the Department are divided into accounts classified as follows: Salaries and Wages; Other Personal Service; Materials and Services; Capital Outlays; and Special Requests. Funds appropriated for use under one classification may not be used for expenditures in a different classification. All departmental expenditures are evidenced by warrants drawn on the State Treasurer and are audited by the office of the Secretary of State.

During the present biennium and in all previous years, funds appropriated by the Legislature were augmented by Legislative authorization to spend from an account set up by the Department's enabling act termed the Geology and Mineral Industries Account. This account received receipts from the sale of publications, from gifts, and from oil and gas drilling permits. An act of the 1957 Legislature abolished this account effective July 1, 1959. As a result all future funds for operating the Department must be obtained from direct appropriation. A statement showing receipts and expenditures of the G&MI Account is given on page 22.

The following table gives a summary of the biennial appropriations made by the last two Legislatures as well as funds requested for the 1959-61 biennium:

	1955 - 1957	1957 - 1959	Requested 1959 - 1961
Salaries & Wages	$ 188,638.00	$ 235,183.00	$ 277,756.00
Other Personal Service	10,364.10	14,302.00	17,280.00
Materials & Services (Gen., Oper., & Maint.)	49,015.00	60,145.00	75,040.00
Capital Outlays	6,950.00	12,822.00	11,748.00
Special Requests	13,500.00	15,000.00	15,000.00
TOTAL	$ 268,467.10	$ 337,452.00	$ 396,824.00

The increase in Salaries & Wages in the 1959-61 budget request is a combination of new wage scales and a request for two new field geologist positions to bring the Portland staff up to an adequate service level. Renovation of the Portland office accounts for the major part of the increase in Materials & Services. The increase in Capital Outlays is to obtain additional equipment for the spectrograph in order to give it broader use.

Comparative Statements of Expenditures According to Bienniums

	1953 - 1955		
	Expenditures 7/1/53 - 6/30/55	G&MI Expenditures 7/1/53 - 6/30/55	Total Expenditures 7/1/53 - 6/30/55
Salaries & Wages	$ 152,253.33		$ 152,253.33
Other Personal Services	$ 8,555.23		$ 8,555.23
General, Operating & Maintenance	$ 43,745.88	$ 2,085.49	$ 45,831.37
Office Supplies	1,106.08		1,106.08
Telephone & Telegraph	1,908.32		1,908.32
Postage, Freight, & Express	2,099.61	68.88	2,168.49
Printing	2,294.36	1,358.20	3,652.56
Rents	21,784.80	380.00	22,164.80
Premiums & Assessments	562.00		562.00
Auditing	588.17		588.17
Industrial & Laboratory	2,476.07	25.16	2,501.23
Heat, Light, Power	686.18		686.18
Library	483.02	225.00	708.02
Laundry	114.11		114.11
Photos & Blueprints	245.48	28.25	273.73
Gas & Oil Well Law Administration	395.93		395.93
All other	737.77		737.77
Building & Ground	265.90		265.90
Travel Expenses: In State	7,274.21		7,274.21
" " : Out of State	723.87		723.87
Capital Outlays:	$ 3,912.45	$ 427.98	$ 4,340.43
Office Furniture & Equipment	335.57		335.57
Motor Vehicles	1,955.20	188.85	2,144.05
Laboratory & Field	801.44	232.17	1,033.61
Library & Others	820.24	6.96	827.20
Special Requests:	$ 9,409.28		$ 9,409.28
State Geological Survey	5,998.67		5,998.67
" " Mapping	3,410.61		3,410.61
Total Expenditures	$ 217,876.17	$ 2,513.47	$ 220,389.64

	1955 - 1957		1957 - 1959	1959 - 1961
Expenditures 7/1/55 - 6/30/57	G&MI Expenditures 7/1/55 - 6/30/57	Total Expenditures 7/1/55 - 6/30/57	Estimated Expenditures 7/1/57 - 6/30/59	Funds Requested 1959 - 1961
$ 183,869.96		$ 183,869.96	$ 235,183.00	$ 277,756.00
$ 10,354.53	$ 249.71	$ 10,604.24	$ 14,302.00	$ 17,280.00
$ 46,608.85	$ 5,473.42	$ 52,082.27	$ 60,145.00	$ 75,040.00
1,093.14	205.25	1,298.39	1,800.00	2,000.00
1,909.79	488.86	2,398.65	2,100.00	3,500.00
2,066.23	99.90	2,166.13	2,300.00	3,100.00
2,333.66	3,596.04	5,929.70	5,900.00	6,000.00
22,624.80		22,624.80	22,745.00	22,865.00
671.72		671.72	700.00	700.00
353.62	431.73	785.35	700.00	800.00
2,474.08	57.33	2,531.41	3,400.00	4,000.00
584.74		584.74	800.00	800.00
416.33	226.50	642.83	700.00	750.00
113.85		113.85	125.00	125.00
214.07		214.07	875.00	900.00
157.97		157.97	500.00	500.00
142.55		142.55	250.00	250.00
132.13		132.13	1,250.00	5,250.00
9,800.79	367.81	10,168.60	14,000.00	20,800.00
1,519.38		1,519.38	2,000.00	2,700.00
$ 4,950.44	$ 731.90	$ 5,682.34	$ 12,822.00	$ 11,748.00
576.94	731.90	1,308.84	2,468.00	683.00
475.00		475.00	5,800.00	3,300.00
3,745.95		3,745.95	3,949.00	5,015.00
152.55		152.55	605.00	2,750.00
$ 13,495.77		$ 13,495.77	$ 15,000.00	$ 15,000.00
13,495.77		13,495.77	15,000.00	15,000.00
$ 259,279.55	$ 6,455.03	$ 265,734.58	$ 337,452.00	$ 396,824.00

GEOLOGY AND MINERAL INDUSTRIES ACCOUNT
(Section 2, Chapter 144, Oregon Laws 1957)

For Period July 1, 1956, to July 1, 1958

Balance June 30, 1956		$ 15,270.66
RECEIPTS:		
Sale of publications	$ 5,727.36	
Sale of mine reports, blueprints, and sundry sales	86.40	
Sale of mineral specimen collections	467.50	
Refunds from Geological Society of the Oregon Country for printing expense	86.35	
Refund from Insurance Company	1.27	
Refunds from U.S. Geological Survey for undelivered publications	11.11	
Witness fees of Thomas C. Matthews	71.44	
Oil and Gas Test Permit Fees	350.00	6,801.43
		22,072.09
DISBURSEMENTS:		
Personal Service:		
State Industrial Accident Contribution	53.29	
Retirement Contributions	169.69	
Civil Service Administration	26.73	
Material and Services:		
Office Supplies	401.48	
Travel Expenses in State	1,048.69	
Industrial and Laboratory	316.14	
Communications	417.71	
Publications	4,683.02	
Auditing	431.73	
Transportation of things	1.07	
Library	359.65	
Gas and oil well administration	6.00	
Photos and Blueprints	6.45	
Capital Outlays:		
Office Equipment	57.90	7,979.55
BALANCE June 30, 1958		$ 14,092.54

THE 1955 - 1957 APPROPRIATION ----

Salaries and wages	$194,474.20	73.1 percent
General, operating, maintenance	52,082.27	19.6 "
Capital outlays	5,682.34	2.1 "
Special requests	13,495.77	5.2 "
TOTAL	$265,734.58	100.0 percent

----AND WHAT IT PAID FOR

39,147	Copies of The Ore.-Bin	471	Mineral sets for students
19,092	Requests from visitors	66	Talks to groups
3,329	Mineral identifications	12	Field trips for groups
26,349	Letters sent	13	Group tours of office
6,685	Chemical analyses	14	Cooperative projects with other agencies
4,472	Determinations for radioactivity	13	Publications issued
1,430	Spectrographic analyses	11	Publications in progress
420	Petrographic examinations	10	Maps published
167	Field investigations	16	Oil and gas drilling permits issued

OREGON'S MINERAL INDUSTRY

During the past 10 years, Oregon's mineral industry has increased 236 percent. This tremendous growth is largely attributable to the great expansion in the production of industrial minerals. The value of raw minerals produced in the State in 1957 was $42,480,000. This figure does not reflect the total impact of the mining and metallurgical industry in the State, however, since it does not include values for metals reduced or refined from imported raw or semifinished materials. In most cases the dollar value reported by the U.S. Bureau of Mines is pegged to the raw materials as they leave the mine or quarry. To bring this figure into line with those used normally in reported values of other of the State's commodities the Federal estimate should be increased approximately two and a half times to about $100,000,000.

In the metals field, only one hard-rock gold mine continued in operation. Mercury production declined, for a variety of reasons, from four active mines early in the biennium to two. Chromite mining was snuffed out completely on May 19, 1958, when the General Services Administration chrome stockpile program suddenly terminated. Prior to that time 34 chromite mines and 17 concentrating plants were active in the State. Test shipments of uranium ore from the White King mine near Lakeview were made late in 1956 and 1957. A contract to build a mill to produce "yellow cake" uranium concentrate was signed in October 1957 and construction started early in 1958. Exploration for lateritic nickel deposits in southwest Oregon was conducted at two areas by two large companies. A growing interest in iron resulted in widespread investigation by several groups.

The metallurgical industry expanded in several directions during the past biennium. Chemical Lime Company constructed and placed in operation the only lime-burning plant in the State. At Albany a new zirconium purification plant was built and additions made to existing facilities. At the end of the biennium plans were announced for the enlarging of the melting capacity of the elemental silicon plant at Springfield.

Industrial Minerals

Limestone and cement

Chemical Lime Company of Baker fired up its $2,000,000 lime plant in October 1957. The plant, which has an annual capacity of 75,000 tons of lime, is the only one of its kind in the Northwest. It employs 50 men and burns stone obtained from a company-owned quarry located on Marble Creek, Baker County, about 10 miles away. Expansions of plant capacity at both Lime, Baker County, and Oswego, Clackamas County, were completed in 1957 by Oregon Portland Cement Company in response to a steadily growing demand. Ideal Cement Company trucked cement rock from its quarries near Wilderville, Josephine County, to the plant at Gold Hill. National Industrial Products Company produced high-calcium crushed limestone at its plant located near a quarry at Durkee, Baker County, and conducted a drilling program to determine the available tonnage of hot-spring travertine near its crushing and screening plant. The easily ground travertine represents a new product for the agricultural market. Greely Lime Company furnished limestone from a quarry near Enterprise, Wallowa County, for the manufacture of calcium carbide at Pacific Carbide & Alloys plant in Portland. A small amount of agricultural limestone was produced from a quarry near Dallas in Polk County.

Sand, gravel, and crushed stone

A stepped-up road-building program plus a growing demand for concrete aggregate increased the production of sand and gravel approximately 10 percent in 1957. Dam construction, industrial and domestic building, and numerous miscellaneous uses accounted for a lesser portion of the total of approximately 9½ million yards of sand and gravel produced. In the Willamette Valley the supply of sand and gravel in the stream beds is diminishing rapidly and competition for new sources is becoming progressively keener. Search for new deposits has been aided in some cases by the use of aerial photographs which show pre-historic stream channels. Crushed stone, valued by the U.S. Bureau of Mines at $10,300,000 was used for much the same purpose as sand and gravel. Most of the State is abundantly supplied with deposits of excellent stone suitable for crushing. In certain areas along the coast there has always been a shortage of rock for road metal. In other areas rock is becoming increasingly harder to locate near the point of use and contractors have had to resort to longer and longer hauls with large, high-speed haulage units.

Oregon's Mineral Industry at a Glance

	1956	1957
Chromite	$ 2,001,083	$ 674,631
Clays	278,205	265,556
Copper	5,950	13,846
Gold	95,830	118,335
Lead	1,570	1,430
Mercury	492,029	986,191
Nickel Ore	(see undistributed)	
Pumice	" " "	
Sand and Gravel	11,646,367	13,481,263
Silver	12,256	14,412
Stone	7,890,197	11,404,962
Undistributed	12,939,583	16,153,541
TOTAL*	$ 34,021,000	$ 42,480,000

* Duplications eliminated

Building stone

Yesterday's volcanoes are helping to brighten today's living. Light shades of buff and red volcanic tuffs found in many parts of central and eastern Oregon are being quarried and cut into shapes for fireplaces, patios, and veneer. Many of the tuffs are colorfully banded and any one deposit may have a wide variety of shades and patterns. The stone is easily sawed, is lighter in weight than most of the regular building stones, and becomes somewhat harder upon exposure. Pacific States Cut Stone Company operates a quarry in northern Jefferson County which produces a banded reddish-brown tuff; the Rainbow Rock quarry south of Pine Grove in Wasco County saws a banded tuff; and a few miles south a tuff similar in appearance called "Indian Candy Stone" is quarried. Natural Stone Company set up a quarry 6 miles south of Rome in Malheur County to turn out a lightweight, gray stone with dark banding. Near Sublimity in Marion County, Oregon Tuff Stone Company sawed dimension blocks "out of the solid." The stone is gray with dark inclusions and is used for walls in cold-storage plants because of its good heat insulation characteristics.

In the Portland area the Rocky Butte quarry produced rough and sawed blocks of lava for flagstones, fireplaces, and similar uses. Near Carver in Clackamas County there was a small production of rough blocks for retaining walls. Although not strictly a building stone, large amounts of a dark red, shaggy volcanic scoria were quarried from Tetherow Butte north of Redmond in Deschutes County. The bulk of the production was used for rockeries and retaining walls where its light weight and ease of shaping make its use particularly attractive. The only nonvolcanic stone production in the State came from a small sandstone quarry just south of Riddle in Douglas County where a dark, thin-bedded, fine-grained stone was quarried for flagging and veneer.

Expanded shale

Two companies, Empire Building Materials and Smithwick Concrete Products, continued to produce expanded shale from quarries in Washington County. The Empire plant has been located at its quarry near Sunset Tunnel since operations began in 1947. Smithwick moved its kiln from Portland to its quarry near Vernonia in 1957. Aggregate produced by the two plants is used in lightweight concrete blocks and for monolithic pours. Lightweight concrete is finding a new field of application in pre-stressed structural members used in bridges and other structures.

Pumice

Production of pumice and volcanic cinders declined slightly in 1957 with a total of 123,644 tons. Three companies, Central Oregon Pumice, Williamson Cascade Pumice, and Harney Concrete Tile Company, were active. Lloyd Williamson, who had been producing continuously since 1946, sold his business to the Boise Cascade Corporation late in 1957, and the business was renamed the Cascade Pumice Company.

An interesting innovation in materials-handling was introduced by Central Oregon Pumice Company when it acquired a 40-cubic-yard dump truck to haul pit-run pumice from its property west of Bend to a processing plant in town. The Company also produces volcanic cinders from a deposit a few miles south of Bend. Harney Concrete Tile Company at Burns in Harney County quarried an unusually hard lump pumice which was found suitable for surfacing logging roads. Part of the Company's output goes into pumice blocks and monolithic concretes. The pumice industry has undergone an almost complete transition since World War II when many inexperienced operators sold raw pumice to block makers. The present plants turn out a closely controlled product tailored to the customer's requirements.

Cinders and scoria

In Central Oregon many miles of State highway are surfaced with volcanic scoria which is available from dozens of cinder cones scattered over the countryside. Scoria is easy to excavate, requires little or no crushing, is much lighter than conventional road metal, and has good frost resistant characteristics. One contractor in the Redmond area specializes in scoria for driveways, paths, and even cinder tracks for athletic fields.

Diatomite

Great Lakes Carbon Corporation operated the only diatomite quarry and preparation plant in the State at Lower Bridge in Deschutes County. The Company conducted an intensive exploration program at a deposit near Fort Rock in Lake County, and considerable quantities of this raw diatomite were trucked to the Lower Bridge plant for test purposes. Some exploration work was also done in the Otis Basin area of eastern Harney County where large reserves of diatomite are exposed. The name of the Company's operation at Lower Bridge was changed recently to the Dicalite Department, Mining and Mineral Products Division.

Carbon dioxide

Ten drilled wells near Ashland produced the only commercial carbon dioxide in the State during the biennium. Gas-Ice Corporation recovered carbon dioxide from the water in the wells and compressed it into cakes of dry ice. The Department initiated a statewide survey of carbon-dioxide springs in 1958.

Silica

A large deposit of high-grade silica was discovered by Roy Rannells in 1957 in southern Douglas County. The deposit is 98+ percent SiO_2 with small amounts of alumina, iron, titania, and calcium. The phosphorus averages .008 percent. A preliminary investigation by the Department indicates that the deposit is a replacement of a volcanic tuff by silica. Bristol Silica Company at Rogue River, Jackson County, produced steadily during the biennium as the State's only source of high purity silica.

Brick and tile

Oregon's oldest mineral industry, which stretches back to early pioneer brick-making activities, revealed little change. Demand for light-colored brick for home construction increased but most of the clays in Oregon are too high in iron to produce the desired colors. Albany Brick and Tile, established in 1880, closed late in 1957; Forest Grove Brick and Tile reopened after a period of several years' inactivity; and Willamina Clay Products built a shuttle kiln at Tigard in Washington County.

Coal

Pacific Power and Light Company made an intensive exploration of the coal reserves at Eden Ridge in southern Coos County with the objective of determining whether or not sufficient coal was available to supply a mine-mouth coal-fired steam plant to provide base-load power. As a part of the proposed development, a small hydro-electric installation taking advantage of a 1650-foot drop in elevation of the South Fork of the Coquille River is being considered to provide peaking power. If the project is carried through to completion it will be the first time in Oregon that energy derived from coal will be used for base-load electric power.

Processing Plants

Vermiculite

Raw vermiculite ore was imported from Libby, Montana, and exfoliated in the Portland area by Vermiculite-Northwest, Inc. Vermiculite is a type of massive mica which expands greatly upon heating. It is used principally for loose-fill insulation.

Calcium hydrate

Industrial Processing Company of Portland prepared powdered calcium hydrate from a sludge obtained from an acetylene gas manufacturing plant. The hydrate was sold for agricultural and other uses.

Perlite

Supreme Perlite Company expanded raw perlite ore obtained from a deposit in Arizona at its Portland plant. Perlite is a volcanic glass which swells considerably when heated suddenly to a high temperature. "Popped" perlite is used as an insulation filler and a lightweight aggregate for special-use concretes and plasters.

Glass

Owens-Illinois Glass Company produced containers at its Portland plant, using raw materials imported from outside the State.

Metals

Uranium

The big news in mining in Oregon in the past two years was the announcement by Lakeview Mining Company on October 18, 1957, that a contract had been signed with the Atomic Energy Commission to build a 210-ton daily-capacity plant to treat uranium ore from its White King Mine. The decision by Lakeview Mining to build a "yellow cake" concentration plant came after almost two years of intensive exploration of the mine area. The deposit, discovered in June 1955, by three Lakeview men, John Rousch, Don Tracey, and Walter Lehman, was leased by Lakeview three months later. Since that time more than 100,000 feet of vertical holes from the surface have been put down and a 700-foot shaft and 4000 feet of underground development have been driven from which numerous underground holes have been drilled. A staff of geologists has explored the area, using standard techniques plus airborne radiation detection equipment. Several large shipments of ore were made to Salt Lake City for mill test purposes prior to the designing of the flow sheet for the mill which will use a solvent extraction system. Provision for custom milling of ore from outlying properties is included in the Atomic Energy Commission contract, with a maximum of 30 percent of the milling capacity being reserved for this purpose.

Construction of the mill, located just north of Lakeview, began in June 1958 and was scheduled to go on stream late in the year. Lakeview acted as its own prime contractor, with The Galigher Company of Salt Lake City providing the engineering for the flow sheet. An interesting feature in connection with the mill is the use of hot water obtained from deep wells drilled about one mile from the plant. The Lakeview district has numerous hot springs and wells and one geyser which spouts 70 feet high. Ore from the mine will be trucked in 50-ton bottom dump trucks by Lakeview Logging Company over their private logging road. Construction of a 3-compartment, 700-foot shaft was started in June 1958. A 96-foot headframe towers over the shaft and will be used for hoisting ore when the mine goes into full production. Approximately 130 men are employed in the mine and mill on a steady, year-around basis. Although no figures have been released except the $2,600,000 cost of the mill, the total expenditure by Lakeview before producing the first drum of "yellow cake" is probably in the neighborhood of $4,000,000.

In addition to the White King Mine, Lakeview Mining is also leasing the adjacent Lucky Lass property. Several thousand tons of ore were removed from an open pit and test drilling was conducted.

Exploration for uranium was also carried out in the Bear Creek area in Crook County south of Prineville. In the Steens Mountain area of southern Harney County Solar-X Corporation of Boise leased a group of claims and did exploration work. Some investigation of the area surrounding the Lakeview deposits was done by individuals. The Department is conducting a geologic study of a considerable area embracing the Lakeview deposits.

Chromite

The chromite producers in the State brought approximately $2,000,000 into Oregon in the biennium. Their activities included 34 active mines and 17 mills which employed more than 200 men. All of the ore produced was sold to the General Services Administration stockpile at Grants Pass. The GSA purchasing program was terminated abruptly on

May 19, 1958, and the State's chrome mines and mills shut down. Oregon is one of the few states in the Union which has reserves of metallurgical-grade chromite. Chromite mineralization is confined to two areas in the State: Grant County in central Oregon and Coos, Curry, Douglas, Jackson, and Josephine counties in southwestern Oregon. The Department conducted its exhaustive geologic study of all chromite deposits in southwestern Oregon during the biennium.

Nickel

The Hanna operations at Riddle, Douglas County, continued at full capacity during the biennium as the only domestic producers of nickel in the United States. Mining operations by the Hanna Mining Company, and smelting by Hanna Nickel Smelting Company employed a total of 440 men on a continuous, year-around basis. The impact of this one operation on the economy of Douglas County has been great since it is not subject to the sharp fluctuations characteristic of other segments of local industry.

There was intensive exploration for nickel in the Cave Junction district of Josephine County by Nickel Corporation of America. Numerous drill holes and large trenches were used to sample the weathered zone on Woodcock and Eight Dollar mountains. In Curry County the Pacific Nickel Company dug some large bulldozer trenches in Red Flat a few miles east of Gold Beach to explore the nickeliferous laterite zone. The Department had earlier investigated these same areas and made a preliminary report on its findings. During the biennium the Department also did some reconnaissance geological studies of the laterite areas lying along the California line in southern Curry County.

Bauxite

Publication by the Department of a detailed report on the ferruginous bauxite deposits of the Salem Hills area in July 1956 immediately attracted the attention of the Harvey Aluminum Company. In the past two years the Company has intensively explored the area and has acquired large acreages. Minor activity was reported in the Washington and Columbia county area where the original discovery of bauxite in the State was made by the Department in 1944. Large acreages in this area are held by the Aluminum Company of America which inaugurated a full-scale drilling and sampling program lasting several years beginning a few months after publication by the Department of a preliminary report on its findings. During the biennium the Department investigated additional reported occurrences of bauxite and assisted several companies interested in the deposits.

Gold, silver, copper, lead, and zinc

Oregon's only hard-rock, year-around gold operation, the Buffalo mine in the Granite district of Grant County, continued to produce during the biennium. Ore from the mine, which dates back to early mining days, is milled on an intermittent basis in a small flotation plant located on the property. A 1400-foot adit 230 feet below the present working level is being driven to tap ore in several veins. The mine is snowbound for long periods but communication is maintained by Snow Cat.

A few other gold mines operated during part of the biennium. The Standard Milling Company moved the 50-ton mill from the Pyx mine to a location just north of Prairie City on Dixie Creek in Grant County to process ore from the Standard mine. Several shipments of gold and copper concentrates were made before a sharp decline in the copper market forced closure. In Jackson County a two-man crew produced gold from the Warner mine.

Concentrates from a small mill were trucked to the smelter at Selby, California. Three other part-time quartz gold mines were active in southwestern Oregon. During the winter months seven small placer mines operated in Josephine County. No bucket-line dredges were active in the State during the biennium. Minor amounts of lead and zinc were recovered as by-products in the mining for gold.

Mercury

Four major mercury operations were active in the State in 1957, with total production roughly double that of the preceding year. These were the Horse Heaven, Bonanza, Black Butte, and Bretz mines. The Horse Heaven mine in Jefferson County, owned by Cordero Mining Company, and the Bonanza mine in Douglas County, operated by the Bonanza Oil and Mine Corporation, were in continuous operation as they had been for a number of years. The Horse Heaven mine, however, pulled the fire under its furnace for the last time in April 1958, when ore reserves had become exhausted. During its life the mine produced 17,000 flasks of mercury. In southern Lane County, Mercury and Chemicals Corporation reactivated the old Black Butte mine in late 1956 with the help of a $62,000 DMEA loan. A 100-ton retort was constructed and produced until September 1957 when the entire operation was abandoned. The Bretz mine in southern Malheur County was reopened in July 1956 by the Arentz-Comstock Mining Venture after a long period of inactivity. An unusual feature of the operation is the use of flotation to concentrate the feed to the furnace which was fired up in December.

Several small mercury mines saw some activity during the biennium. In Jefferson County the Axehandle mine, idle for a number of years, was leased by Falcon Mercury and Exploration under a DMEA loan started early in 1958. A 20-ton rotary furnace was installed at Glass Buttes in northeastern Lake County by Oregon Uranium Corporation in the spring of 1957. A small amount of metal was produced during the balance of the year. In southern Lake County, Western Mineral Company opened up a mercury prospect in the fall of 1957 and moved a 30-ton Lacey furnace on the ground six months later. In the Ochocos, Crook County, Mia mines erected a small mill in the fall of 1957 at the old Mother Lode property to concentrate ore prior to retorting. The Department began a State-wide study and inventory of mercury deposits in 1957, with a field geologist devoting nearly full time to the work.

Electro Process Plants

A second aluminum reduction smelter was added to the State's steadily growing list of electro process plants during the biennium with the opening of the Harvey Aluminum Company plant at The Dalles, having an annual capacity of 100,000,000 pounds of aluminum. Both the Harvey and the long-established Reynolds Metals plant at Troutdale reduce alumina which is imported from foreign sources. In Springfield, National Metallurgical Corporation continued the production of elemental silicon, using silica from Rogue River, Oregon, and Reno, Nevada, and announced plans to add another electric furnace costing in the neighborhood of $500,000.

The production of the reactive-use metals in Oregon increased considerably with the completion of a brand-new reduction plant at Albany by Wah Chang for the purification of

zirconium tetrachloride to zirconium sponge. The plant employs 350 men and produces about 30,000 pounds of sponge a month. Hafnium, removed as an impurity from the zirconium tetrachloride was converted into metal ingots by the U.S. Bureau of Mines at its station in Albany, under an Atomic Energy Commission contract. Also in Albany is the plant operated by Oregon Metallurgical which processes zirconium and titanium sponge into ingots, castings, and forgings. Oregon Metallurgical added new, large presses duing the biennium partly to handle a $4,000,000 contract to supply the 350,000 pounds of zirconium ingots to Westinghouse.

Pacific Carbide & Alloys Company reduced high-calcium marble, obtained from a quarry near Enterprise in Wallowa County, and coke to form calcium carbide in its Portland plant. The Portland plant of Electro Metallurgical Company also produced calcium carbide and ferro-alloys.

Oil and Gas Exploration

Three deep oil tests and eleven shallow oil tests were drilled in Oregon during the two-year period between July 1, 1956, and July 1, 1958. No commercial quantity of oil or gas was found in any of these holes. Total footage drilled in the period was 46,111 feet. A tabulation of footage drilled by years is shown below:

1953	5,202 ft.
1954	20,036 ft.
1955	44,317 ft.
1956	9,458 ft.
1957	28,975 ft.
1958	16,700 ft. (projected)

Approximately 1½ million acres of Federal and State land were leased in Oregon for oil and gas exploration as of July 1, 1958. Mineral rights on 1,056,158 acres of Federal land were under lease in Oregon on June 30, 1958. Most of the leases were for oil and gas. Lease fees returned to the State for distribution to counties amounted to $40,233 in the biennium. State land leased for oil and gas exploration amounted to 8,426 acres in 1958. Yearly rentals collected from these leases totaled $1,999.

Well records released from the confidential oil files in December 1957 revealed that minor traces of oil were found in Standard Oil Company's "Pexco State No. 1" drilled in southeastern Crook County. The traces were found in cores at 6916-6936 feet and 7349-7354 feet. The geologic formation penetrated by the well was recorded as Clarno from the surface to total depth, 7594 feet. The Clarno formation is a series of continental volcanics and sediments of upper Eocene age.

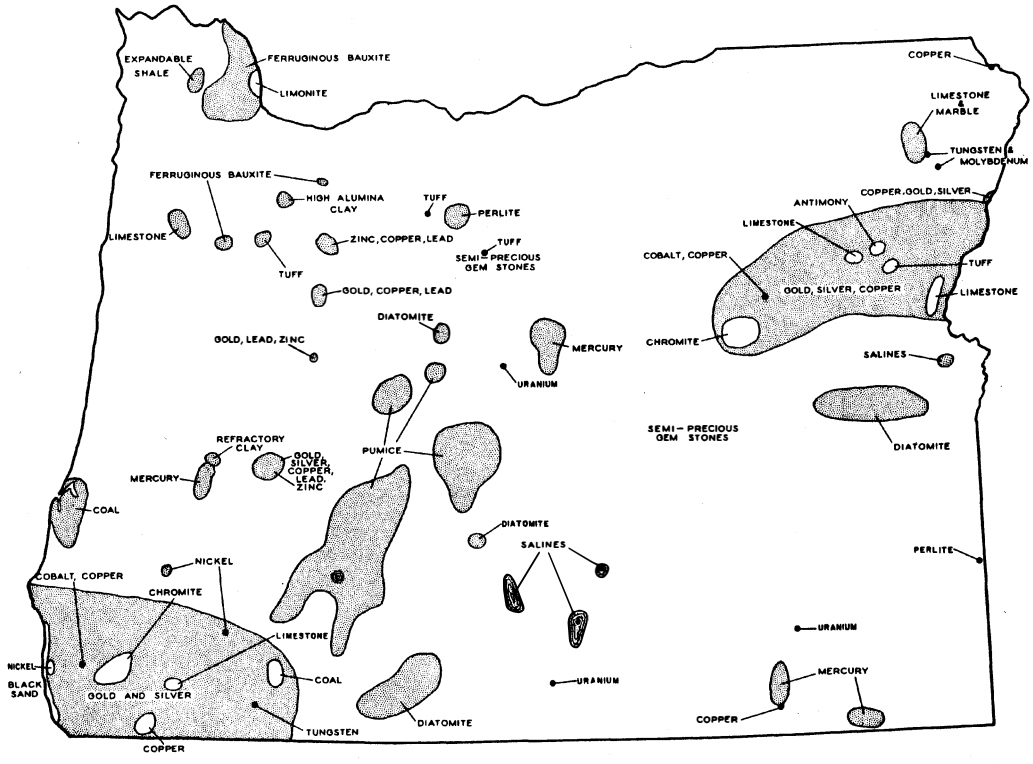
Discovery of high-gravity oil near Grays Harbor, Washington, in July 1957 aroused a great deal of interest in prospects for production in the Northwest. J.W.Tanner, Sunshine Mining Company, et al, "Medina No. 1," produced at a rate of 190 barrels per day on production test in August 1957 from the interval 3952-3958 feet. The reservoir rock is a fractured shale with thin sandstone interbeds and is roughly equivalent to shales of the Astoria formation in northwestern Oregon. This discovery brought immediate inquiries to the State Land Board concerning leasing of offshore mineral rights in western Tillamook and Clatsop counties.

Geologic field studies were carried on in Oregon by ten major oil companies during the period covered by this report. Several smaller groups made geologic surveys during this time; a few of these studies resulted in drilling programs. Geologic exploration by seismic reflection was done by two major companies in areas of Oregon during the biennial period dated July 1, 1956, to July 1, 1958. During this time two oil companies made surface geologic correlations by means of auger-hole drilling along county roads in western Oregon. Gravity surveys are known to have been made by one company searching for oil structures in Oregon during the biennium and probably similar surveys by at least one other company.

As of July 1, 1958, two major oil companies were maintaining exploration offices in Oregon and had crews working in the field. General Petroleum Corporation closed its field office in Eugene July 1957, and Sinclair Oil Company closed its exploration office in Portland September 1958. Five major oil companies were maintaining exploration offices in Washington as of July 1, 1958.

Oil exploration is expected to continue in the Northwest during the coming years. Forecasts for the oil industry are that demand for oil and natural gas will greatly increase in the next 15 years and that oil companies must find new reserves to meet it.

GENERALIZED MINERAL LOCALITIES MAP



DEPARTMENT PUBLICATIONS ISSUED DURING ELEVENTH BIENNIUM

July 1, 1956, through June 30, 1958

Bulletins

A complete list of Department publications is given at the end of this bulletin. The following publications have been issued during the biennium covered by this report.

BULLETIN 1 - (Second printing of fourth revision) - "Mining Laws of Oregon," 1956. This publication presents information to the public on the various phases of departmental activities as set up by the State Legislature; the laws concerning mining and mining claims; O&C lands' mineral entries; mining claims on the public domain and within Mount Hood National Forest; and the essentials of assessment work. A section of the bulletin is devoted to Federal placer mining laws and regulations. 1,000 copies cost $200.01.

BULLETIN 46 - "Ferruginous bauxite deposits in the Salem Hills, Marion County, Oregon," by R. E. Corcoran, geologist, and F. W. Libbey, mining engineer, 1956.

Bauxite in the Salem Hills was discovered by the Department in 1945 and a brief reconnaissance study was made at that time. The present bulletin is the outcome of a follow-up project to obtain more definite information about the quantity and quality of the bauxite in the Salem Hills area. Bulletin 46 gives a description of the geology of the area, the limit of the area found to be underlain by bauxite, and the results of the Department's drilling program. A large number of analyses of samples are listed. Included in the Bulletin is a report by Prof. Edwin Rhoedder, formerly with the University of Utah and now with the U.S. Geological Survey, on the mineralogy of titanium found in the Salem Hills bauxite. The Bulletin has 53 pages and numerous illustrations. A topographic map and a geologic map are in pocket. 1,550 copies cost $1,138.45.

BULLETIN 47 - Tenth Biennial Report of the Department for the period July 1, 1956, to July 1, 1958. 830 copies cost $558.51.

Short Papers

SHORT PAPER 7 - (Third printing) - "Geologic history of the Portland area," by Ray C. Treasher, 1958. One-thousand copies of this nontechnical paper were issued in 1942; 500 copies in 1951; and popular demand necessitated a reprint of 400 in 1958. 400 cost $51.76.

SHORT PAPER 13 - (Second printing) - "Antimony in Oregon," by Norman S. Wagner, 1958. Continued interest in antimony made it necessary to re-issue the report. 210 copies cost $59.60.

Miscellaneous Papers

MISCELLANEOUS PAPER 1 - (Third printing) - " A description of some Oregon rocks and minerals," by Hollis M. Dole, 1956.

This paper was prepared to accompany school mineral sets composed of rocks and minerals most commonly found in Oregon. The text includes a classification of rocks and a description of specimens in the sets together with an outline of their uses, occurrences in the State, and other pertinent information. 990 copies cost $279.15.

MISCELLANEOUS PAPER 2 - (Third printing) - "Key to Oregon Mineral Deposits Map," by Ralph S. Mason, 1957. This pamphlet contains information regarding the properties shown on "Oregon Mineral Deposits Map" (1954). The first printing of 1,250 copies was depleted in 1955; the second, of 1,045, in 1956. 2,000 copies cost $141.42 (1957).

MISCELLANEOUS PAPER 5 - (Second printing) - "Oregon's gold placers," 1957, compiled by the Department staff. This paper was published to answer many requests received by the Department for information on location of gold placers and placer mining in Oregon. The first issue of 885 copies was exhausted in 1957. 2,000 cost $131.42.

The Ore.-Bin

THE ORE.-BIN - This small monthly periodical is prepared in the office of the Department. Monthly circulation is 1500, of which 413 are sent free to legislators, Oregon libraries, educational institutions, and a restricted exchange list. A yearly subscription charge of 50 cents is made to cover cost of assembling and mailing. The principal value of such a publication is to present the mineral industry viewpoint on problems affecting the industry, and to provide pertinent information on Oregon mining and geology. The Ore.-Bin serves also for announcement of new publications, and publishes statistics on Oregon mineral production as soon as they are available. During the Biennium ending June 30, 1958, there were 49,778 copies issued at a cost of $3,543.04.

Geologic Maps

GEOLOGIC MAP - "Reconnaissance geologic map of the Lebanon quadrangle, Oregon," by Ira S. Allison, Chairman of the Department of Geology, Oregon State College, and Wayne M. Felts, Senior Geologist with the Texas Company, 1956. The Lebanon quadrangle lies east of the Albany quadrangle and is part of the Willamette Valley area being mapped by Dr. Allison and associates. Geology of the Albany quadrangle was published as Department Bulletin No. 37 in 1953. The Lebanon geologic map is colored and has a text on the back. 1,500 cost $602.80.

MISCELLANEOUS MAPS PUBLISHED

QUICKSILVER LOCALITY MAP - (Reprint) 22 x 34 inches, 1956. 1,000 cost $175.00.

LANDFORMS MAP - (Reprint) 17 x 22 inches, 1957. 2,000 cost $127.63.

INDEX TO TOPOGRAPHIC MAPPING - 8½ x 11 inches. 2,000 cost $14.57.

INDEX TO GEOLOGIC MAPPING - 8½ x 11 inches (red overprint). 4,000 cost $48.85.

MINERAL LOCALITIES MAP - 8½ x 11 inches (red overprint). 4,500 cost $44.78.

GEMSTONE LOCALITY MAP - 8½ x 11 inches (red overprint). 2,000 cost $17.00.

COLUMBIA GORGE MAP - 8½ x 11 inches. 500 cost $7.10.

Geologic Maps (cont.)

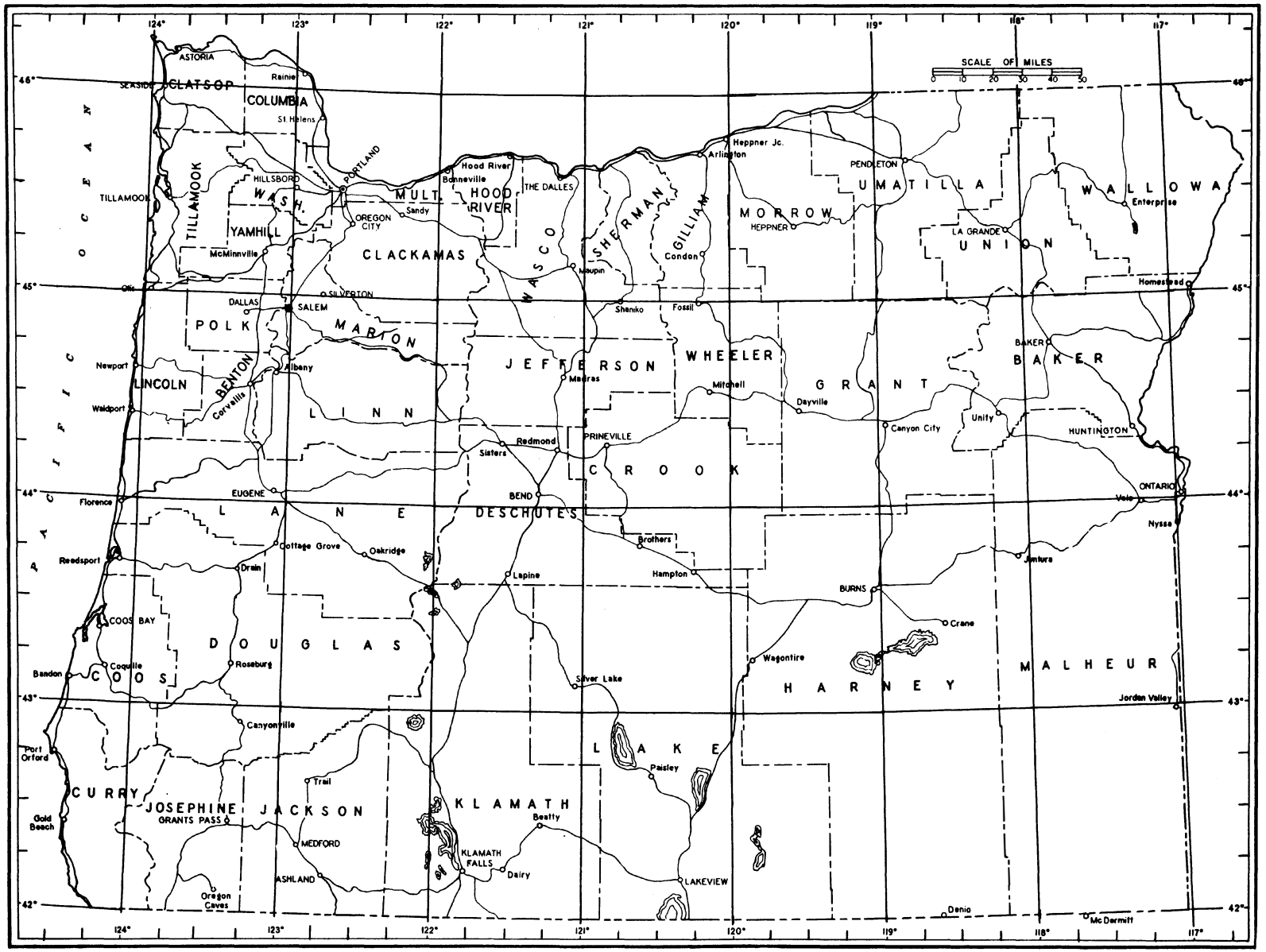
GEOLOGIC MAP - "A geologic map of the Bend quadrangle, Oregon, and a reconnaissance geologic map of the central portion of the High Cascade mountains," by Howel Williams, Department of Geologic Sciences, University of California, in cooperation with the U. S. Geological Survey, 1957. Descriptive texts accompanying the maps are written in a nontechnical style, their purpose being to make the geology understandable to the many interested persons who visit or live in this scenic region. 5,071 maps cost $1,124.50.

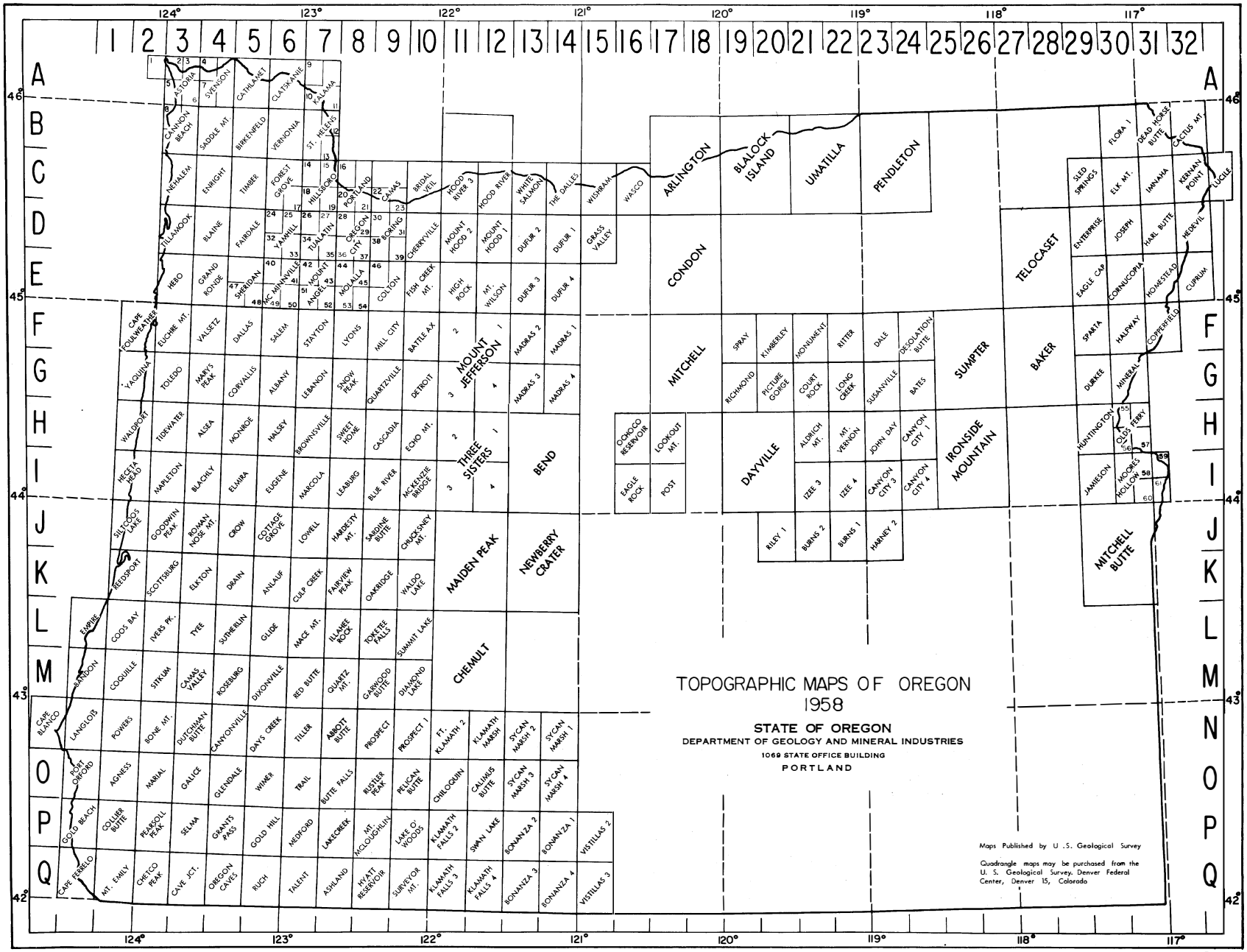
STATUS OF TOPOGRAPHIC MAPPING IN OREGON

Approximately half of the State is topographically mapped at the present time. The areas for which topographic map quadrangles are available are shown on the accompanying index map. An alphabetical list of the quadrangles appears on the back of the index map. The first topographic maps published by the U.S. Geological Survey in Oregon covered one degree of latitude and longitude, embraced 3500 square miles, and were reproduced on a scale of 4 miles to the inch. Current mapping by the Federal Survey is being done on two scales, 15-minute quadrangles published with a scale of 1 mile to the inch, covering an area of approximately 200 square miles, and 7½-minute quadrangles with a scale of slightly more than 2½ inches to the mile and covering 50 square miles. At the present rate of mapping in Oregon, the U.S. Geological Survey estimates that all of the State will be covered in approximately 14 years. The task will not be complete then, since older maps will have become obsolete and will need either revision or complete remapping.

The Department maintains a complete file of all topographic quadrangles published for areas in Oregon. These are available for inspection by the public but are not for sale by the Department. Copies may be obtained locally from stationers and blue print firms, or directly from the U. S. Geological Survey, Denver Federal Center, Denver, Colorado. Copies of index maps showing the status of topographic mapping in the State are distributed free of charge by both the Federal Survey and the Department.

Modern topographic quadrangle maps contain a wealth of information that is useful to both the professional worker and the layman. In addition to providing an accurate base on which engineering planning and geologic mapping can be done, the maps serve the sportsman, the camper, the agate hunter, in fact everyone in need of a good map which shows all the streams, roads, trails, mountains, culture, elevations and configurations of the land surface, areas covered by forest, and sections, townships, and ranges.


SCALE OF MILES
0 10 20 30 40 50
124° 123° 122° 121° 120° 119° 118° 117°
46° 45° 44° 43° 42°
PACIFIC OCEAN
ASTORIA
SEASIDE
CLATSOP
COLUMBIA
Rainier
St. Helens
TILLAMOOK
TILLAMOOK
WASH.
HILLSBORO
PORTLAND
YAMHILL
McMinnville
OREGON CITY
Sandy
MULT
HOOD RIVER
Hood River
Bonneville
THE DALLES
CLACKAMAS
WASCO
SHERMAN
GILLIAM
MORROW
Heppner Jc.
Arlington
Condon
Heppner
PENDLETON
UMATILLA
WALLOWA
Enterprise
LA GRANDE
UNION
Homestead
Otis
DALLAS
SILVERTON
SALEM
POLK
MARION
Shaniko
Fossil
Newport
LINCOLN
BENTON
Albany
Corvallis
Waldport
JEFFERSON
WHEELER
Madras
Mitchell
GRANT
Dayville
BAKER
BAKER
Canyon City
Unity
HUNTINGTON
LINN
Redmond
Sisters
PRINEVILLE
CROOK
Florence
EUGENE
BEND
DESCHUTES
ONTARIO
Vale
Nyssa
Brothers
Reedsport
Cottage Grove
Oakridge
Drain
Lapine
Hampton
Juntura
BURNS
COOS BAY
Crane
DOUGLAS
Coquille
Roseburg
Bandon
COOS
Wagontire
Silver Lake
MALHEUR
HARNEY
Jordan Valley
Canyonville
Port Orford
LAKE
Paisley
Trail
CURRY
JOSEPHINE
JACKSON
GRANTS PASS
KLAMATH
Beatty
Gold Beach
MEDFORD
KLAMATH FALLS
Dairy
ASHLAND
LAKEVIEW
Oregon Caves
Denio
McDermitt


TOPOGRAPHIC MAPS OF OREGON
1958
STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND
Maps Published by U.S. Geological Survey
Quadrangle maps may be purchased from the U. S. Geological Survey, Denver Federal Center, Denver 15, Colorado
REVISED 1958

TOPOGRAPHIC MAPS OF OREGON 1958

15-Minute Quadrangles

(Scale 1:62,000)

Name	Location	Date
Abbott Butte	N-8	1947
Agness	O-2	1956
Albany	G-6	1944 A
Aldrich Mountain	H-21	1943
Alsea	H-4	C1942 A
Anlauf	K-6	1939
Ashland	Q-8	1954
Astoria	A-3	C1939
Bandon	M-1	1944
Bates	G-24	1951
Battle Ax	F-10	1956
Birkenfeld	B-5	1955
Blachly	I-4	C1942 A
Blaine	D-4	1955
Blue River	I-9	1955
Bonanza 1	P-14	B
Bonanza 2	P-13	B
Bonanza 3	Q-13	B
Bonanza 4	Q-14	B
Bone Mountain	N-3	1954
Boring	D-9	1944
Bridal Veil	C-10	1954
Brownsville	H-7	1952
Burns 1	J-22	B
Burns 2	J-21	B
Butte Falls	O-8	1954
Cactus Mountain	B-32	B
Calimus Butte	O-12	A
Camas	C-9	1941 A
Camas Valley	M-4	1955
Cannon Beach	B-3	1955
Canyon City 1	H-24	B
Canyon City 3	I-23	B
Canyon City 4	I-24	B
Canyonville	N-5	1956
Cape Blanco	N-0	1956
Cape Ferrelo	Q-1	1956
Cape Foulweather	F-2	1944 A
Cascadia	H-9	A
Cathlamet	A-5	1941
Cave Junction	Q-4	1954
Cherryville	D-10	1955
Chetco Peak	Q-3	1954
Chiloquin	O-11	A
Chucksney Mountain	J-10	1955
Clatskanie	A-6	1952
Collier Butte	P-2	1954
Colton	E-9	1955
Coos Bay	L-2	1945
Copperfield	F-31	B
Coquille	M-2	1945
Cornucopia	E-30	A
Corvallis	G-5	C1942 A
Cottage Grove	J-6	1921 A
Courtrock	G-21	1956
Crow	J-5	1945
Culp Creek	K-7	1955
Cuprum	E-32	B
Dale	F-23	1951
Dallas	F-5	C1942 A
Days Creek	N-6	1954
Dead Horse Butte	B-31	B
Desolation Butte	F-24	1951
Detroit	G-10	1956
Diamond Lake	M-10	1956
Dixonville	M-6	1954
Drain	K-5	1954
Dufur 1	D-14	B
Dufur 2	D-13	B
Dufur 3	E-13	B
Dufur 4	E-14	B
Durkee	G-29	A
Dutchman Butte	N-4	1948
Eagle Cap	E-29	1954
Eagle Rock	I-16	1948
Echo Mountain	H-10	A
Elk Mountain	C-30	A
Elkton	K-4	1955
Elmira	I-5	C1942 A
Empire	L-1	1944
Enright	C-4	1955
Enterprise	D-29	A
Euchre Mountain	F-3	1957
Eugene	I-6	1949
Fairdale	D-5	1955
Fairview Peak	K-8	1955
Fish Creek Mountain	E-10	1956
Flora 1	B-30	B
Forest Grove	C-6	A
Fort Klamath 2	N-11	A
Galice	O-4	1948
Garwood Butte	M-9	1956
Glendale	O-5	1954
Glide	L-6	1954
Gold Beach	P-1	1954
Gold Hill	P-6	A
Goodwin Peak	J-3	1956
Grand Ronde	E-4	1955
Grants Pass	P-5	1954
Grass Valley	D-15	B
Halfway	F-30	A
Halsey	H-6	1941 A
Hardesty Mountain	J-8	1955
Harl Butte	D-31	1954
Harney 2	J-23	B
Hebo	E-3	1955
Heceta Head	I-2	1956
He Devil	D-32	1922 A
High Rock	E-11	1956
Hillsboro	C-7	1943 B
Homestead	E-31	A
Hood River	C-12	A
Hood River 3	C-11	B
Huntington	H-29	1951
Hyatt Reservoir	Q-9	1955
Illahee Rock	L-8	1955
Imnaha	C-31	1954
Ivers Peak	L-3	1955
Izee 3	I-21	B
Izee 4	I-22	B
Jamieson	I-29	1950
John Day	H-23	1943
Joseph	D-30	A
Kalama	A-7	C1943
Kernan Point	C-32	1954
Kimberley	F-20	1953
Klamath Falls 2	P-11	B
Klamath Falls 3	Q-11	B
Klamath Falls 4	Q-12	B
Klamath Marsh	N-12	A
Lakecreek	P-8	1954
Lake O' Woods	P-10	1955
Langlois	N-1	1954
Leaburg	I-8	1951
Lebanon	G-7	C1944 B
Long Creek	G-22	1951
Lookout Mountain	H-17	1951
Lowell	J-7	1955
Lucile	C-33	B
Lyons	F-8	1951
Mace Mountain	L-7	1955
Madras 1	F-14	B
Madras 2	F-13	B
Madras 3	G-13	B
Madras 4	G-14	B
Mapleton	I-3	1945 A
Marcola	I-7	1952
Marial	O-3	1954
Marys Peak	G-4	1942 A
McKenzie Bridge	I-10	A
McMinnville	E-6	1943
Medford	P-7	1954
Mill City	F-9	1955
Mineral	G-30	A
Molalla	E-8	C1943
Monroe	H-5	C1942 A
Monument	F-21	1951
Moores Hollow	I-30	1951
Mount Angel	E-7	1943
Mount Emily	Q-2	1954
Mount Hood 1	D-12	B
Mount Hood 2	D-11	B
Mount Jefferson 1	F-12	B
Mount Jefferson 2	F-11	B
Mount Jefferson 3	G-11	B
Mount Jefferson 4	G-12	B
Mount McLoughlin	P-9	1955
Mount Vernon	H-22	1943
Mount Wilson	E-12	1956
Nehalem	C-3	1955
Oakridge	K-9	1956
Ochoco Reservoir	H-16	1950
Olds Ferry	H-30	1952
Oregon Caves	Q-5	1954
Oregon City	D-8	1945 A
Pearsoll Peak	P-3	1954
Pelican Butte	O-10	1955
Picture Gorge	G-20	1955
Portland	C-8	A
Port Orford	O-1	1954
Post	I-17	1951
Powers	N-2	1954
Prospect	N-9	1956
Prospect 1	N-10	B
Quartz Mountain	M-8	1955
Quartzville	G-9	1956
Red Butte	M-7	1955
Reedsport	K-2	1956
Richmond	G-19	1953
Riley 1	J-20	B
Ritter	F-22	1952
Roman Nose Mount.	J-4	1945
Roseburg	M-5	1955
Ruch	Q-6	1954
Rustler Peak	O-9	1955
Saddle Mountain	B-4	1955
Salem	F-6	1940 A
Sardine Butte	J-9	A
Scottsburg	K-3	1955
Selma	P-4	1954
Sheridan	E-5	C1942 A
Siltcoos Lake	J-2	1942 A
Sitkum	M-3	1955
Sled Springs	C-29	A
Snow Peak	G-8	1951
Sparta	F-29	A
Spray	F-19	1953
Stayton	F-7	C1944 A
St. Helens	B-7	1954
Summit Lake	L-10	1956
Surveyor Mountain	Q-10	1955
Susanville	G-23	1951
Sutherlin	L-5	1954
Svensen	A-4	1955
Swan Lake	P-12	A
Sweet Home	H-8	1951
Sycan Marsh 1	N-14	B
Sycan Marsh 2	N-13	B
Sycan Marsh 3	O-13	B
Sycan Marsh 4	O-14	B
Talent	Q-7	1954
The Dalles	C-14	A
Three Sisters 1	H-12	B
Three Sisters 2	H-11	B
Three Sisters 3	I-11	B
Three Sisters 4	I-12	B
Tidewater	H-3	1945
Tillamook	D-3	1955
Tiller	N-7	1946
Timber	C-5	1955
Toketee Falls	L-9	1956
Toledo	G-3	1946 A
Trail	O-7	1945
Tualatin	D-7	1943
Tyee	L-4	1955
Valsetz	F-4	C1942 A
Vernonia	B-6	1955
Vistillas 2	P-15	B
Vistillas 3	Q-15	B
Waldo Lake	K-10	A
Waldport	H-2	C1942 A
Wasco	C-16	A
White Salmon	C-13	A
Wimer	O-6	1954
Wishram	C-15	A
Yamhill	D-6	C1942
Yaquina	G-2	1946 A

Special Map

Crater Lake National Park	N-10	1:62,000

KEY TO SYMBOLS

A Map scheduled for publication 7-1-58 to 6-30-59

B Map scheduled for publication 7-1-59 to 6-30-60

C Map published by U. S. Army 29th Engineers

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1 OREGON

7½-Minute Quadrangles

(Scale 1:24,000)

Name	Location	Date
Amity	49	A
Astoria	3	C1949
Ballston	48	1956
Beaverton	27	1954
Camas	22	1954
Canby	36	1954
Carlton	32	1957
Cathlamet Bay	4	C1949
Clatsop Spit	1	1951
Colton	46	1955
Corbett	23	A
Damascus	30	1954
Dayton	41	A
Deer Island	12	1954
Dixie Mountain	14	1956
Dundee	33	1956
Estacada	39	1954
Forest Grove	17	1956
Gaston	24	1956
Gearhart	5	C1949
Gervais	51	A
Gladstone	29	1954
Green Mountain	7	C1949
Hillsboro	18	1954
Kalama	11	1953
Kelso	9	1953
Laurelwood	25	1956
Linnton	19	1954
Malheur Butte	60	1951
McMinnville	40	A
Mission Bottom	50	1957
Molalla	45	1954
Moores Hollow	58	1951
Mt. Tabor	21	1954
Newberg	34	1954
Olds Ferry	56	1952
Olds Ferry NW	55	1952
Olds Ferry SE	57	1952
Olney	6	C1949
Oregon City	37	1954
Oswego	28	1954
Payette	61	1951
Portland	20	1954
Rainier	10	1953
Redland	38	1954
Sandy	31	1954
Sauvie Island	15	1954
Scholls	26	1954
Scotts Mills	53	1954
Sheridan	47	1956
Sherwood	35	1954
Silverton	52	1956
St. Helens	13	1954
St. Paul	42	1956
Tillamook Head	8	C1949
Vancouver	16	1954
Warrenton	2	C1953
Weiser South	59	1951
Wilhoit	54	1955
Woodburn	43	A
Yoder	44	1955

30-Minute Quadrangles

(Scale 1:125,000)

Arlington	C-18	1941
Baker	G-28	1934
Bend	I-14	1940
Blalock Island	C-20	1944
Chemult	M-12	1941
Condon	E-18	1916
Dayville	I-20	1936
Dufur	E-14	1945
Hood River	C-12	1940
Ironside Mountain	I-26	1908
Madras	G-14	1931
Maiden Peak	K-12	1944
Mitchell	G-18	1926
Mitchell Butte	K-30	1921
Mount Hood	E-12	1944
Mount Jefferson	G-12	1938
Newberry Crater	K-14	1935
Pendleton	C-24	1935
Sumpter	G-26	1939
Telocaset	E-28	1932
The Dalles	C-14	1941
Three Sisters	I-12	1941
Umatilla	C-22	1921

State of Oregon
Department of Geology and Mineral Industries, 1069 State Office Building, Portland 1, Oregon

PUBLICATIONS

BULLETINS	Price postpaid*
1. Mining laws of Oregon, 4th revision, 1954. Contains Federal placer mining regulations	$ 0.50
2. Progress report on Coos Bay coal field, 1938: F. W. Libbey	0.15
3. Geology of part of the Wallowa Mountains, 1938: C. P. Ross	(out of print)
4. Quicksilver in Oregon, 1938: C. N. Schuette	(out of print)
5. Geological report on part of the Clarno Basin, 1938: Donald K. Mackay	(out of print)
6. Preliminary report on some of the refractory clays of Western Oregon, 1938: Wilson and Treasher	(out of print)
7. The gem minerals of Oregon, 1938: H. C. Dake	(out of print)
8. Feasibility of steel plant in lower Columbia area, rev. ed., 1940: R. M. Miller	0.40
9. Chromite deposits in Oregon, 1941, rev. ed.: J. E. Allen	(out of print)
10. Placer mining on Rogue River in relation to fish and fishing, 1938: H. B. Ward	(out of print)
11. Geology and mineral resources of Lane County, Oregon, 1938: W. D. Smith	(out of print)
12. Geology and physiography of northern Wallowa Mountains, 1941: W. D. Smith and J. E. Allen, et al	(out of print)
13. First biennial report of the Department, 1937-38	(out of print)
14. Oregon metal mines handbooks: by the staff	
A. Baker, Union, and Wallowa counties, 1939	(out of print)
B. Grant, Morrow, and Umatilla counties, 1941	(out of print)
C. Vol. I, Coos, Curry, and Douglas counties, 1941	(out of print)
Vol. II, Section 1, Josephine County, 1952 (2d ed.)	1.25
Section 2, Jackson County, 1943	(out of print)
D. Northwestern Oregon, 1951	1.25
15. Geology of Salem Hills and North Santiam River basin, Oregon, 1939: T. P. Thayer	(out of print)
16. Field identification of minerals for Oregon prospectors and collectors, rev.ed., 1954: compiled by Ray C. Treasher	1.00
17. Manganese in Oregon, 1942: by the staff	(out of print)
18. First aid to fossils, or what to do before the paleontologist comes, 1939: J. E. Allen	(out of print)
19. Dredging of farmland in Oregon, 1939: F. W. Libbey	(out of print)
20. Analyses and other properties of Oregon coals, 1940: H. F. Yancey and M. R. Geer	(out of print)
21. Second biennial report of the Department, 1939-40	(out of print)
23. Investigation of reported occurrence of tin at Juniper Ridge, Oregon, 1942: H. C. Harrison and J. E. Allen	(out of print)
24. Origin of the black sands of the coast of southwestern Oregon, 1943: W. H. Twenhofel	(out of print)
25. Third biennial report of the Department, 1941-42	(out of print)
26. Soil: Its origin, destruction, and preservation, 1944: W. H. Twenhofel	0.45
27. Geology and coal resources of Coos Bay quadrangle, 1944: J. E. Allen and E. M. Baldwin	1.00
28. Fourth biennial report of the Department, 1943-44	(out of print)
29. Ferruginous bauxite in northwestern Oregon, 1945: F. W. Libbey, W. D. Lowry, and R. S. Mason	(out of print)
30. Mineralogical and physical composition of the sands of the Oregon coast from Coos Bay to the mouth of the Columbia River, 1945: W. H. Twenhofel	(out of print)
31. Geology of the St. Helens quadrangle, 1946: W. D. Wilkinson, W. D. Lowry, and E. M. Baldwin	(out of print)
32. Fifth biennial report of the Department, 1945-46	(out of print)
33. Bibliography (supplement) of the geology and mineral resources of Oregon, 1947: J. E. Allen	1.00
34. Mines and prospects of the Mt. Reuben mining district, Josephine County, Oregon, 1947: E. A. Youngberg	0.50
35. Geology of the Dallas and Valsetz quadrangles, Oregon, 1947: E. M. Baldwin	(out of print)
36. (1st vol.) Five papers on foraminifera from the Tertiary of Western Oregon, 1947: J. A. Cushman, R. E. Stewart, and K. C. Stewart	1.00
(2d vol.) Two papers on foraminifera from the Tertiary of Western Oregon and Western Washington, 1949: Cushman, Stewart, and Stewart; and one paper on mollusca and microfauna of Wildcat coast section, Humboldt County, California, 1949: Stewart and Stewart	1.25
37. Geology of the Albany quadrangle, Oregon, 1953: Ira S. Allison	0.75
38. Sixth biennial report of the Department, 1947-48	(out of print)
39. Geology and mineralization of the Morning Mine and adjacent region, Grant County, Oregon, 1948: R.M.Allen	(withdrawn pend.rev.)
40. Preliminary description of the geology of the Kerby quadrangle, Oregon, 1949: Wells, Hotz, and Cater	0.85
41. Ground-water studies in Umatilla and Morrow counties, 1949: Norman S. Wagner	1.25
42. Seventh biennial report of the Department, 1948-50	(out of print)
43. Eighth biennial report of the Department, 1950-52	(out of print)
44. Bibliography (2d supplement) of the geology and mineral resources of Oregon, 1953: M. L. Steere	1.00
45. Ninth biennial report of the Department, 1952-54	Free
46. Ferruginous bauxite deposits in the Salem Hills, Marion County, Oregon, 1956: R.E. Corcoran and F.W.Libbey	1.25
47. Tenth biennial report of the Department, 1954-1956	Free
48. Eleventh biennial report of the Department, 1956-1958	Free

* Prices subject to change; please include remittance with order.

12/23/58

PUBLICATIONS (cont.)

G.M.I. SHORT PAPERS

	Price postpaid
1. Preliminary report upon Oregon saline lakes, 1939: O. F. Stafford	(out of print)
2. Industrial aluminum - a brief survey, 1940: Leslie L. Motz	$ 0.10
3. Advance report on some quicksilver prospects in Butte Falls quadrangle, Oregon, 1940: W. D. Wilkinson	(out of print)
4. Flotation of Oregon limestone, 1940: J. B. Clemmer and B. H. Clemmons	0.10
5. Survey of nonmetallic production of Oregon for 1940-41: C. P. Holdredge	(out of print)
6. Pumice and pumicite, 1941: James A. Adams	(out of print)
7. Geologic history of the Portland area (3rd Printing), 1958: Ray C. Treasher	0.25
8. Strategic and critical minerals, a guide for Oregon prospectors, 1942: L. W. Staples	(out of print)
9. Some manganese deposits in the southern Oregon coastal region, 1942: R. E. Brown	(out of print)
10. Investigation of Tyrrell manganese and other nearby deposits, 1943: W. D. Lowry	(out of print)
11. Mineral deposits in region of Imnaha and Snake rivers, Oregon, 1943: F. W. Libbey	(out of print)
12. Prelim. report on high-alumina iron ores in Washington County, Oregon, 1944: Libbey, Lowry, and Mason	(out of print)
13. Antimony in Oregon (2d printing), 1958: Norman S. Wagner	0.25
14. Notes on building-block materials of eastern Oregon, 1946: Norman S. Wagner	0.15
15. Reconnaissance geology of limestone deposits in the Willamette Valley, Oregon, 1946: J. E. Allen	(out of print)
16. Perlite deposits near the Deschutes River, southern Wasco County, Oregon, 1946: J. E. Allen	(out of print)
17. Sodium salts of Lake County, Oregon, 1947: Ira S. Allison and Ralph S. Mason	0.15
18. Radioactive minerals the prospector should know (2d rev.), 1955: David J. White and Max Schafer	0.30
19. Brick and tile industry in Oregon, 1949: J. E. Allen and R. S. Mason	0.20
20. Glazes from Oregon volcanic glass, 1950: Charles W. F. Jacobs	0.20
21. Lightweight aggregate industry in Oregon, 1951: Ralph S. Mason	0.25
22. Preliminary report on tungsten in Oregon, 1951: Harold D. Wolfe and David J. White	0.35

GEOLOGIC MAPS

Geoligic map of the Wallowa Lake quadrangle, 1938: W. D. Smith and others	(out of print)
Geologic map of the central portion of the Wallowa Mountains, Oregon, 1938: W. D. Smith and others	0.20
Geologic map of the Salem Hills and North Santiam River basin, Oregon, 1939: T. P. Thayer	0.25
Geologic map of the Medford quadrangle, 1939: F. G. Wells and others	0.40
Geologic map and geology of the Round Mountain quadrangle, 1940: W. D. Wilkinson and others	(out of print)
Geologic map of the Butte Falls quadrangle, 1941: W. D. Wilkinson and others	(out of print)
Geologic map and geology of the Grants Pass quadrangle, 1940: F. G. Wells and others	(out of print)
Preliminary geologic map of the Sumpter quadrangle, 1941: J. T. Pardee and others	0.40
Geologic map of the Portland area, 1942: Ray C. Treasher	0.25
Geologic map of the Coos Bay quadrangle, 1944: J. E. Allen and E. M. Baldwin (sold with Bull. 27)	----
Geologic map of the St. Helens quadrangle, 1945: Wilkinson, Lowry, and Baldwin (also in Bull. 31)	0.35
Geologic map of the Dallas quadrangle, Oregon, 1947: E. M. Baldwin (also in Bull. 35)	0.25
Geologic map of the Valsetz quadrangle, Oregon, 1947: E. M. Baldwin (also in Bull. 35)	0.25
Prelim. geologic map of the Kerby quadrangle, Oregon, 1948: Wells, Hotz, and Cater (also in Bull. 40)	0.80
Geologic map of the Albany quadrangle, Oregon, 1953: Ira S. Allison (also in Bull. 37)	0.50
Geologic map of the Galice quadrangle, Oregon, 1953: F. G. Wells and G. W. Walker	1.00
Reconnaissance geologic map of the Lebanon quadrangle, Oregon, 1956: Ira S. Allison and Wayne M. Felts	0.75
Geologic map of the Bend quadrangle, and reconnaissance geologic map of the central portion of the High Cascade Mountains, Oregon, 1957: Howel Williams	1.00

MISCELLANEOUS PAPERS

1. A description of some Oregon rocks and minerals (prepared to accompany school mineral sets), (3rd printing), 1956: Hollis M. Dole	0.40
2. Key to Oregon mineral deposits map (3rd printing), 1957: Ralph S. Mason	0.15
3. Facts about fossils (Reprints), 1953	0.35
4. Rules and regulations for the conservation of oil and natural gas, 1954	0.50
5. Oregon's gold placers (Reprints), (2nd printing) 1957	0.25
6. Oil and gas exploration in Oregon, 1954: R. E. Stewart	1.00

MISCELLANEOUS PUBLICATIONS

The Ore.-Bin - issued monthly by the staff as medium for news about the Department, mines, and minerals. (Available back issues 5 cents each.) Subscription price per year	0.50
Oregon mineral deposits map (22 x 34 inches), rev., 1958	0.30
Oregon quicksilver localities map (22 x 34 inches) 1946	0.30
Landforms of Oregon: a physiographic sketch (17 x 22 inches) 1941	0.25
Index to topographic mapping in Oregon, 1958	Free
Index to published geologic mapping in Oregon, 1956	Free

12/23/58