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OREGON'S MINERAL AND METALLURGICAL INDUSTRY IN 1976

Ralph S. Mason, Deputy State Geologist
Oregon Department of Geology and Mineral Industries

Oregon's mineral and metallurgical industries almost exactly equalled the 9-year record production established in 1975. Preliminary figures for 1976 show a total of $106,122,000, which compares with $106,004,000 for the previous year. The current year's production may be low and subject to upward revision, as indicated by the final figures for last year, which were nearly 20 percent more than the preliminary estimate. The U.S. Bureau of Mines makes the annual canvass of mineral producers largely by mail. Slowness in response plus other difficulties account for the adjustment of the preliminary figures.

Little change was noted in the amount of production for the various commodities compared to last year. The value represented by the production which cannot be disclosed increased considerably, however, to a total of $33.6 million. This category includes cement, copper, diatomite, emery, gold, lead, silver, talc, and nickel.

Not included in the State total shown above is an additional $500 million worth of Oregon metallurgical products such as ferroalloys, carbide, reactive metals, ferro-silicon, ceramic ware, and aluminum.

Industrial Minerals

Production of both sand and gravel and crushed stone declined slightly over the previous year, responding to the continuing low level of heavy construction and road building. Interest in future supplies of these vital commodities took a sharp upward turn during the year as more and more county and city governments requested assistance from the State Department of Geology and Mineral Industries. Cooperative studies with several counties were underway during the year, and more are scheduled for 1977.

Sand and gravel and stone accounted for 62.5 percent of the State's mineral production in 1976, but the importance of these commodities to community development far outweighs the dollar value. No substitute exists for most of the uses to which the products are put; and when local supplies are exhausted, transportation assumes a major role in the laid-down cost.

Operation of the Empire Lite-Rock expansible shale quarry and plant in Washington County was assumed by GATX Leasing Corporation. The plant was forced to suspend operations during the year since it could not meet emission standards set by the Department of Environmental Quality. The plant had been in almost continuous operation since 1944, producing lightweight aggregate and pozzolan.

Skeletons of highly ornamented, tiny aquatic plants were mined, processed, and sold for pet litter by American Fossil, Incorporated at its diatomite operation in Christmas Valley in northern Lake County.

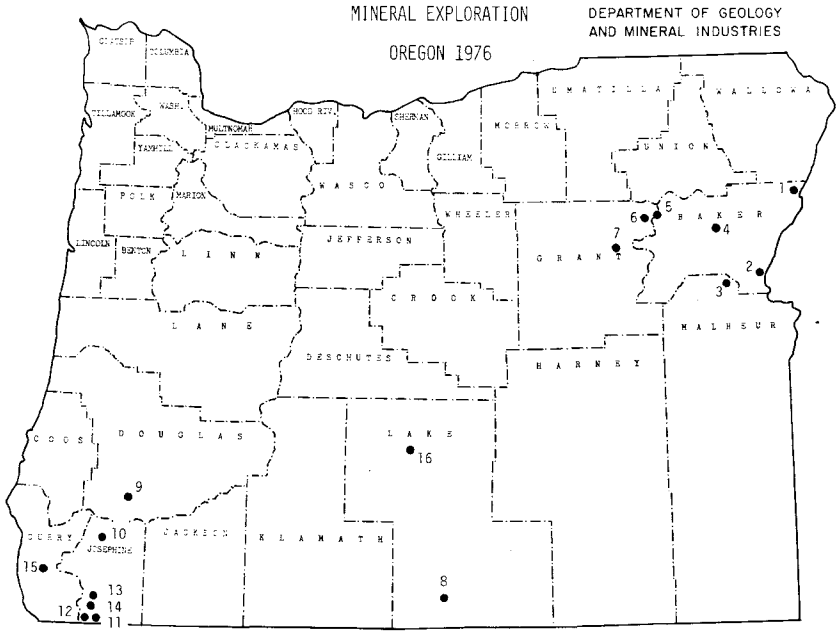
Table 1. Some of Oregon's minerals at a glance

Minerals	1975	1976*
Clays	$ 214,000	$ 263,000
Gem stones	500,000	500,000
Lime	3,281,000	2,727,000
Nickel	W	W
Pumice	3,937,000	4,014,000
Sand and gravel	29,596,000	24,850,000
Stone	40,321,000	40,142,000
Value of items not disclosed: cement, copper, diatomite, emery, gold, lead, silver, talc, nickel.	28,155,000	33,621,000
TOTAL	$106,004,000	$106,122,000

*Preliminary data provided by U.S. Bureau of Mines

EXPLORATION PROGRAMS

Numerous exploration programs were underway in Oregon during 1976. Considerable interest was directed to old mining districts having a history of gold, silver, or copper production. The search for geothermal energy intensified with both State and private industry conducting drilling campaigns and temperature gradient studies. Interest in uranium and chromite was revived. Two companies fielded crews searching for low-grade nickel deposits, and the Oregon Department of Geology and Mineral Industries entered into an agreement with the U.S. Bureau of Mines to study nickel resources.



1. IRON DYKE CU-AU	5. MEADOW LAKE CU	9. SILVER PEAK CU-ZN-AG	13. EIGHT DOLLAR MTN. NI
2. BAYHORSE AG	6. NEW YORK AU	10. ALMEDA AG-CU	14. WOODCOCK MTN. NI
3. BASIN CREEK PLACER	7. DIXIE MEADOW AU	11. QUEEN OF BRONZE CU-AU	15. RED FLAT NI
4. VIRTUE AU	8. WHITE KING U	12. TURNER ALBRIGHT CU	16. AMERICAN FOSSIL, INC.

The Iron Dyke copper mine on the Snake River in eastern Baker County was explored by Texasgulf. The Iron Dyke has a history extending back to the discovery of the deposit in 1897. The mine and mill were active during the first two decades of this century. In recent years there has been sporadic activity but no real production.

The Cougar and New York mines, Granite district, eastern Grant County, were investigated by W. A. Bowes and Associates of Steamboat Springs, Colorado. Both properties have a history of gold and silver production but have been idle in recent years. Plans to heap-leach the ore with sodium cyanide starting in the spring of 1977 were announced.

An intensive program of exploration and development was carried out by Dixie Meadows Gold Mines Ltd. at the old Dixie Meadows mine in the Quartzburg district of Grant County.

Johns-Manville continued exploration drilling at their Meadow Lake copper property near the crest of Elkhorn Ridge in Baker County. The company began investigating the area in 1971 with a soil sampling program, followed by diamond drilling. Due to environmental considerations the surface has been disturbed little. Drilling equipment has been transported either on all-terrain vehicles or by backpack.

Ibex Minerals,Inc. rehabilitated the main haulage level of the long-idle Bayhorse silver mine near Huntington on the Snake

River. The mine, which has a record of 286,000 ounces of silver produced prior to 1920, is being diamond drilled to determine the extent of the mineralized horizon.

The Big Yank Lode, a mineralized zone extending from the Almeda mine on the Rogue River northward for 35 miles to the Silver Peak mine in Douglas County, was the center of attention for Chevron, American Selco, Canadian Superior, Texasgulf, and Utah International. A total of $350,000 in copper, gold, and silver was produced from the various mines scattered along the lode early in the century. Cominco was also active in the area, focusing attention on the portion of the mineralized zone extending southward from the Almeda mine.

In the Takilma area of southern Josephine County, Canadian Superior reopened the Queen of Bronze mine, which supported a smelter in the early 1900's and has a history of production of about 35,000 tons. The deposit of small, irregular-shaped, somewhat lenticular bodies of massive sulphides was discovered in 1862.

The lateritic nickel deposits of southwestern Oregon were investigated by Inspiration at the Rough and Ready group, Inter-American Nickel Co. at Eight Dollar Mountain in Josephine County, and Hanna Nickel at Woodcock Mountain, several miles to the south. Hanna also continued its investigation at Red Flat in Curry County. The Oregon Department of Geology and Mineral Industries completed an evaluation of nickel resources in southwestern Oregon under a contract with the U.S. Bureau of Mines. The Department plans to pursue the study in the northeastern part of the State in 1977. The Bureau of Mines Albany Metallurgical Research Center conducted a series of metallurgical extraction tests on nickel laterites during the year.

American Selco explored the Turner-Albright copper-gold mine in southern Josephine County. Masses of highly silicified gossan enclosed in greenstone contain both pyrite and chalcopyrite.

At the Virtue gold mine near Baker, Tony Brandenthaler tested some of the old dumps to determine if they could be heap-leached. The Virtue, located in 1862, produced $2,200,000 in the period ending in 1907.

Western Nuclear did some exploratory drilling at the White King uranium mine in Lake County. The company has maintained ownership of both the White King and the adjacent Lucky Lass mines for many years. The properties are the only ones with records of uranium production in the State. Exxon and Utah International have established land positions in the same general area, and both conducted some drilling during 1976.

The Metals

Oregon retained the distinction of being the only state in the Union with a producing nickel mine. Hanna Mining Co. operated its Nickel Mountain mine and smelter at Riddle, Douglas County throughout the year, producing an estimated 19,847 short tons of nickel. The mine and smelter have been in continuous operation since 1954.

Production of gold continued at a very low level during the year. Basin Creek Mines, Inc. continued its placering on Basin Creek in the Mormon Basin district of northern Malheur County. Water for the operation must be pumped, settled, and recycled. Production during the operating season, June through September, totaled about 1,000 ounces.

Growing concern over the continued availability of metallurgical grade chromite from foreign sources prompted a renewed interest in southwestern Oregon chromite deposits. Oregon chrome mines contributed substantial quantities of high-grade lump ore and concentrates during World War II and the succeeding stockpile program.

Although Oregon is not a major metal mining state, the mineral processing industry's nine plants produced aluminum, ferroalloys, steel, zirconium, and titanium valued at more than $520 million from out-of-state ores and recycled materials. A total of 21 nonferrous and 15 iron and steel foundries in the State shipped products valued at an estimated $1 billion.

* * * * *

MINED LAND RECLAMATION IN 1976

Standley L. Ausmus, Administrator, Mined Land Reclamation
Oregon Dept. of Geology and Mineral Industries

During 1976, completed mined-land reclamation projects totalled 31. Typical projects for converting mined land to beneficial use were: Reforestation; restoration of range land; development of recreation sites; reclamation of solid-waste landfills for home, industrial, and commercial building sites; and restoration of mined land to agricultural use. Some lands having no immediate beneficial use were contoured and landscaped to blend as imperceptibly as possible with the surrounding terrain.

The sizes of these sites range from 1 or 2 acres up to 40 or 50 acres, with an average of 8 to 10 acres of disturbed land reclaimed at each. Continuing at this rate, we will be reclaiming 30 to 40 acres of mined land per month. Reclamation costs average $150 per acre. Offsetting this expense are increased land values, protection and preservation of natural resources, and improved quality of the immediate environment. Although some of these benefits are not measurable in dollars, the overall balance is tipped in favor of reclamation.

As of January 1, 1977 there were 206 active surface mining permits in effect, with approved reclamation plans on file. Active sites with "grandfather" certificates (limited exemptions) totalled 312. An additional 461 surface-mining sites are registered but are

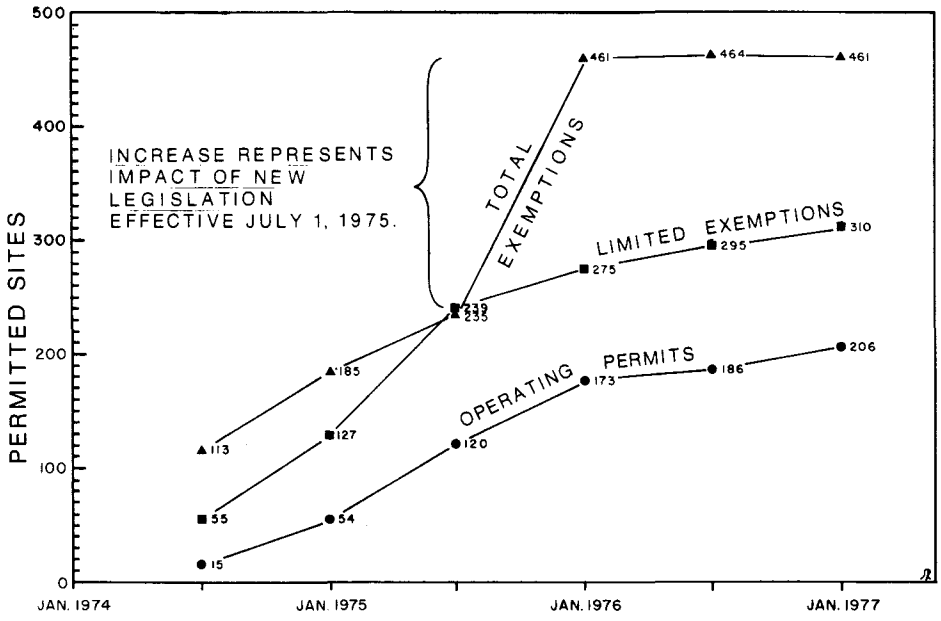


Figure 1. Mined land reclamation growth since 1974.

either inactive or too small to require permits at the time of registration. The status of each of these totally exempt sites is reviewed annually.

Total site registration as of January 1, 1977 was 1,314. Of these, 335 sites have been completed, abandoned, or determined to be under the jurisdiction of either the State Board of Forestry or the Division of State Lands.

New mining permits, with approved reclamation plans, are issued at an average of 5 per month, and another 10 permits are renewed each month. New limited exemptions are registered at the rate of 5 per month, and 18 are renewed.

Growth in mined land reclamation since January 1974 is shown in Figure 1.

* * * * *

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* * * * *

GEOTHERMAL ACTIVITY IN 1976

Donald A. Hull* and V.C. Newton, Jr.**

Government agencies and university researchers conducted more geothermal research in Oregon in 1976 than in 1975. Exploration by industry groups decreased, however, and no major discoveries were reported. One deep-test well was drilled and a second one, begun late in 1975, was finished. The major part of the exploration effort involved drilling shallow gradient holes to depths generally less than 500 feet. The Department issued six permits for deep wells and nine permits for prospect (thermal gradient) well projects in 1976.

Industry Activity

The majority of exploration programs were conducted east of the Cascade Range in the Basin and Range geologic province. Thermal Power Co. drilled a production test to a depth of 5,842 feet, south of Klamath Falls (see Figure 1); but caving and loss of tools forced the company to abandon the hole.

Chevron Oil Co. drilled temperature gradient holes in the Bully Creek area west of Vale in Malheur County, in the Alvord Desert near Fields, and in the Warner Valley south of Adel. AMAX Exploration, Inc. is currently engaged in a gradient drilling project in the Bully Creek area. Phillips Petroleum Co. drilled gradient holes near Newberry Volcano and Glass Buttes during the summer. Weyerhaeuser Co. and Pacific Power and Light Co. drilled a 2,000-foot hole west of Klamath Falls to test for geothermal gradient. (See Figure 2.)

Temperature gradient holes drilled by private companies are designed to locate and outline areas of abnormally high subsurface temperature, and in some cases subsequent deep drilling may be warranted.

The modest level of exploration by private companies in 1976 compared to 1975 was due to several factors, including: (1) The continued delay in leasing of key Federal lands in the Western Cascades and at Glass Buttes, (2) the lack of suitable Federal tax incentives for high-risk geothermal explorations, and (3) discouraging results in early drilling ventures. (Tables 1, 2, and 3.)

Research

Basic and applied geothermal studies are being conducted in the State by university researchers, the U.S. Geological Survey,

* Geothermal Researcher, Oregon Dept. of Geol. and Mineral Indus.
** Petroleum Engineer, Oregon Dept. of Geol. and Mineral Indus.

Figure 1.

Thermal Power Company deep geothermal test drilling (5,842 feet) about 18 miles south of Klamath Falls.

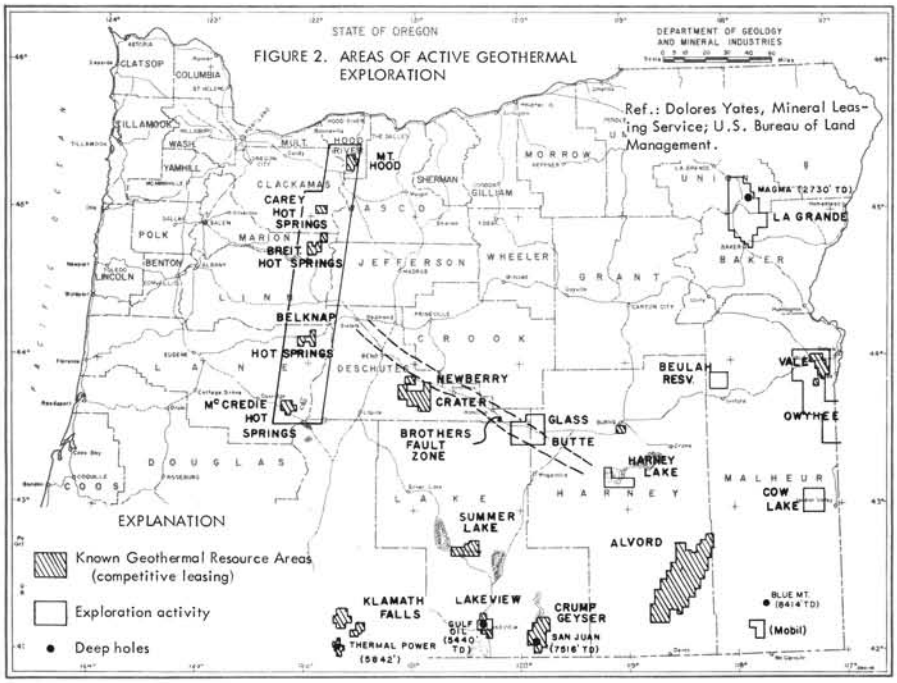

Table 1. Geothermal deep well permits, 1976

Permit Number	Date Issued	Company	Location	Status
8	10/30/75	Weyerhaeuser - Pac. Power and Light	NE1/4NW1/4 sec. 15, T. 37 S., R. 7 E., Klamath Co.	Drilled 2,006'. Completed as temperature monitoring hole. Cased to total depth. Hole spudded in 1975 and drilling completed in 1976.
9	6/11/76	Thermal Power Co.	SW1/4 sec. 35, T. 40 S., R. 9 E., Klamath Co.	Drilled 5,842'. Pipe stuck at 2,400', backed off drill pipe and plugged hole. Abandonment in process.
10	8/28/76	Dept. of Geol. and Mineral Ind.	Proj. sec. 15, T. 2 S., R. 8 E., Clackamas Co.	Proposed to drill to 2,000'. Project postponed because of withdrawal of access to the Bull Run Reserve.
11	8/30/76	Dept. of Geol. and Mineral Ind.	Proj. sec. 19, T. 2 S., R. 8 E., Clackamas Co.	Proposed to drill to 2,000'. Project postponed because of withdrawal of access to the Bull Run Reserve.
12	10/15/76	Dept. of Geol. and Mineral Ind.	SE1/4 sec. 21, T. 4 S., R. 28 E., Morrow Co.	Proposed to drill to 1,000'. Mechanical difficulties encountered. Completed as monitor hole with total depth of 850'.
13	10/19/76	Republic Geothermal, Inc.	SE1/4 sec. 28, T. 18 S., R. 45 E., Malheur Co.	Proposed to drill to 1,500'. Project postponed.
14	10/19/76	Republic Geothermal, Inc.	SE1/4 sec. 28, T. 18 S., R. 45 E., Malheur Co.	Proposed to drill to 8,000'. Project postponed.

Table 2. Geothermal prospect well permits (thermal gradient holes), 1976

Permit No.	Date Issued	Company	Location	No. Holes - Status
16	5/19/76	Dept. of Geol. and Mineral Ind.	Glass Buttes area, Lake and Deschutes Counties	11 gradient holes, depth not to exceed 500'. Holes still being monitored.
17	6/4/76	Chevron Oil Co.	Southern Warner Valley, Lake Co.	21 gradient holes, depth not to exceed 500'. Holes still being monitored.
18	6/4/76	Chevron Oil Co.	West of Vale, Malheur Co.	18 gradient holes, depth not to exceed 500'. Holes still being monitored.
19	6/4/76	Chevron Oil Co.	Alvord Valley, Harney Co.	13 gradient holes, depth not to exceed 500'. Holes still being monitored.
20	6/10/76	Dept. of Geol. and Mineral Ind.	Western Cascades	10 gradient holes, depth not to exceed 500'. Includes one hole near Timberline Lodge. Holes still being monitored.
21	-	Dept. of Geol. and Mineral Ind.	Old Maid Flat, Mount Hood area	Changed to a deep well permit after decision to drill below 500'.
22	-	Republic Geothermal, Inc.	Vale area, Malheur Co.	Changed to a deep well permit after firm decided to drill deeper than 500'
23	10/19/76	Dept. of Geol. and Mineral Ind.	Succor Creek, Malheur Co.	5 gradient holes, depth not to exceed 500'. Holes still being monitored.
24	10/26/76	Dept. of Geol. and Mineral Ind.	Western Cascades (project extended)	5 gradient holes, depth not to exceed 500'. Includes a hole near Snow Bunny, Mount Hood. Holes still being monitored.
25	11/10/76	Dept. of Geol. and Mineral Ind.	Brothers fault zone, Malheur Co. (project extended)	4 gradient holes, depth not to exceed 500'. Project cancelled.
26	11/25/76	AMAX Explor., Inc.	Bully Creek area, Malheur Co.	44 gradient holes, depth not to exceed 500'. Drilling is in progress.

and the Oregon Department of Geology and Mineral Industries. (See list of reports below.)

Gunnar Bodvarsson at Oregon State University (OSU) is studying forced geo-heat extraction and modeling of thermophysical processes. At Oregon Institute of Technology (OIT) John Lund is investigating corrosion associated with geothermal fluids.

The Eastern Oregon Community Development Council at La Grande is investigating the feasibility of district space heating in Baker and Union Counties under the direction of Rich Huggins. The Geo-Heat Institute at OIT, the Oregon Department of Economic Development, and the Oregon Department of Geology and Mineral Industries are jointly studying applications of geothermal energy in food processing in the Klamath Falls and Vale-Ontario areas, with funds provided by the U.S. Energy Research and Development Administration. Brian Baker at the University of Oregon and Richard Couch at OSU are directing gravity and aeromagnetic surveys in the High Cascades and in the Vale area in Malheur County. At OIT John Lund is studying hydrological and geochemical aspects of the geothermal reservoir in the Klamath Falls urban area. Gene G. Culver, from OIT, and Gordon M. Reistad, from OSU, are investigating downhole heat exchanger designs. Paul J. Lienau, director of the Geo-Heat Institute at OIT, is studying the feasibility of district heating in Klamath Falls. Don J. Karr and W.C. Johnson are studying greenhouse and aquaculture applications, respectively.

The Oregon Department of Geology and Mineral Industries is continuing statewide heat-flow studies, under the direction of Donald Hull, with funding provided in part by the U.S. Geological Survey. Emphasis in 1976 was in the Western Cascade Range and the Brothers fault zone.

Norman Peterson, of the Department, and Walter Youngquist, consultant, completed a geologic reconnaissance of geothermal areas in the Western Cascades, financed jointly by the Eugene Water and Electric Board and the Department. Paul Hammond continued geologic studies on geothermal potential of the Western Cascades for a research project sponsored jointly by Portland General Electric Co. and the Department. The Department also contributed to studies of geothermal potential in the Old Maid Flat area near Mount Hood. The project objective was development of a hot water supply for the Portland area. Consulting geologist John Hook was the principal researcher, and Northwest Natural Gas Company assisted in funding the investigation and made a feasibility estimate for transmission facilities.

Richard Bowen, consulting geologist, prepared estimates for use of geothermal water to heat the Timberline Lodge at Mount Hood. This work, financed by the Department as part of its study of heat flow in the Cascades, included drilling a hole near the lodge to measure the geothermal gradient.

Ed Sammel and John Sass, of the U.S. Geological Survey, have recently completed a detailed study, including heat-flow data, of hydrology in the Klamath Falls basin.

Table 3. Federal geothermal exploration permits

Company	Date	Area	Type Survey
Hunt Oil Co.	3/24/76	Owyhee, Malheur Co.	Electrical resistivity
Chevron Oil Co.	5/4/76	Vale area, Malheur Co.	Electrical resistivity
Chevron Oil Co.	4/28/76	Warner Valley, Lake Co.	Electrical resistivity
Geonomics, Inc.	10/6/76	Alvord Desert, Harney Co.	Electrical resistivity, magnetotelluric
So. Union Prod.	12/1/76	Summer Lake, Lake Co.	Suite of geologic and geophysical surveys

Leasing

More than 2,000,000 acres are either applied for or under lease in Oregon for geothermal rights. A total of 78,136 acres of noncompetitive leases and 53,226 acres of competitive leases were in effect on Federal lands in Oregon at the beginning of the year. Another 1,200,000 acres of noncompetitive leases are now pending. The U.S. Bureau of Land Management held three lease sales in 1976, selling production rights on approximately 20,000 acres of KGRA lands (Tables 4 and 5).

The U.S. Bureau of Land Management processing of environmental reviews has advanced so well that the backlog of lease filings should be considerably reduced by this time next year. Applications for geothermal leases were filed during the year in the following areas:

Mount Hood area	Portland Gen'l. Electric Co.
Sisters area	PGE
Glass Buttes area	Phillips Petroleum Co.
Carey (Austin) Hot Springs area	Alaska Pacific Lumber
Carey H.S. area	Charlotte Hook
Carey H.S. area	Laura Spangler
Carey H.S. area	Sun Oil Co.
Warner Valley	Chevron Oil Co.

Table 4. Federal geothermal lease sales, 1976[1]

KGRA	Date	Tract No.	Bidder	Acres	Total Bid	Bid per Acre
Klamath Falls	5/13/76	1	Thermal Power Co.	280.00	$1416.80	$ 5.06
Klamath Falls	5/13/76	2-10	no bids	-	-	-
Klamath Falls	5/13/76	11	Thermal Power Co.	628.40	6353.13	10.11
Klamath Falls	5/13/76	12	Thermal Power Co.	600.00	6066.00	10.11
Klamath Falls	5/13/76	13	Thermal Power Co.	160.00	499.20	3.12
Klamath Falls	5/13/76	14	Thermal Power Co.	118.85	1201.58	10.11
Summer Lake	9/23/76	1	So. Union Prod. Co.	2391.70	9351.55	3.91
Summer Lake	9/23/76	2	Chevron Oil Co.	2281.85	4041.00	1.77
Summer Lake	9/23/76	3-4	no bids	-	-	-

[1]Area Geothermal Office, U.S. Geological Survey, Palo Alto, California

Table 5. Reoffering of Federal leases

KGRA	Date	Tract No.	Bidder	Acres	Total Bid	Bid per Acre
Vale H.S.	12/9/76	1	Union Oil Co.	1280	$27,021	$21.11
Vale H.S.	12/9/76	2	Union Oil Co.	2245	47,393	21.11
Vale H.S.	12/9/76	3	AMAX Explor.	2003	2,323	1.16
Crump Geyser	12/9/76	4-10	no bids	-	-	-
Crump Geyser	12/9/76	11	Chevron Oil Co.	1920	6,029	3.14
Crump Geyser	12/9/76	12	no bids	-	-	-
Crump Geyser	12/9/76	13	Chevron Oil Co.	1600	13,091	8.18
Crump Geyser	12/9/76	14	Chevron Oil Co.	1360	7,018	5.16
Crump Geyser	12/9/76	15-17	no bids	-	-	-
Klamath Falls	12/9/76	18-26	no bids	-	-	-
Klamath Falls	12/9/76	27	So. Union Prod.	1688	3,932	2.33
Klamath Falls	12/9/76	28	So. Union Prod.	1160	2,703	2.33

Indications are that economic conditions will continue to be favorable, and with continued effort geothermal energy can become one of the State's important resources.

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Hull, D.A., Bowen, R.G., Blackwell, D.D., and Peterson, N.V., 1976, Geothermal gradient data, Brothers fault zone, central Oregon: Oregon Dept. Geol. and Mineral Indus. open-file report O-76-2, 24 p.

Peterson, D.L., and Meyer, R.F., 1976, Principal facts for a gravity survey of Summer Lake Known Geothermal Resource Area, Oregon: U.S. Geol. Survey open-file report 76-702A, 4 p.

Sass, J.H., Galanis, S.P., Jr., Munroe, R.J., and Urban, I.C., 1976, Heat-flow data from southeastern Oregon: U.S. Geol. Survey open-file report 76-217, 52 p.

Senterfit, R.M., and Bedinger, G.M., 1976, Audio-magnetotelluric data log and station location map for the Klamath Falls Known Geothermal Resource Area, U.S. Geol. Survey open-file report 73-320, 6 p.

Senterfit, R.M., and Dansereau, D.A., 1976, Station location map and audio-magnetotelluric data log for Summer Lake Known Geothermal Resource Area, Oregon: U.S. Geol. Survey open-file report 76-514, 6 p.

* * * * *

OREGON ACADEMY OF SCIENCE TO MEET IN FEBRUARY

The 1977 meeting of the Oregon Academy of Science will be held in the Erb Memorial Union, University of Oregon, Saturday, February 26. William Loy, Department of Geography, is in charge of arrangements. Registration will start at 8:30 and a fee of $1.00 will be charged. Meetings will begin at 9:00 a.m. and continue the full day at the eight concurrent sections. Co-chairmen for the Geology Section are Robert Lawrence, Oregon State University, and Ansel Johnson, Portland State University.

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OIL AND GAS EXPLORATION IN 1976

V. C. Newton, Jr.
Petroleum Engineer, Oregon Dept. of Geology and Mineral Industries

Onshore

The Department issued drilling permits to Reichhold Energy Corporation and Texas independent, Michel T. Halbouty, in 1976. Reichhold reportedly was delayed by a partnership arrangement, so drilling did not begin this year. Halbouty postponed drilling until Federal leases are issued in the area of interest. There was no exploration boom in Oregon, but more oil companies are asking, "Why not oil in the Beaver State?" The number of deep exploration holes per square mile of prospective sedimentary basin is lower in Oregon than almost anywhere else in the United States.

Drilling Permits

Company	Permit	Well	Location	Projected Depth	Status
Reichhold Energy Corp.	#69	Columbia County #1	NW 1/4 sec.11 T 6 N, R 5 W Columbia Co.	4,000'	Drilling pending
Michel T. Halbouty	#70	Federal #1-10	NE 1/4 sec.10 T 23 S,R 29 E Harney Co.	8,500'	Drilling pending

Leasing

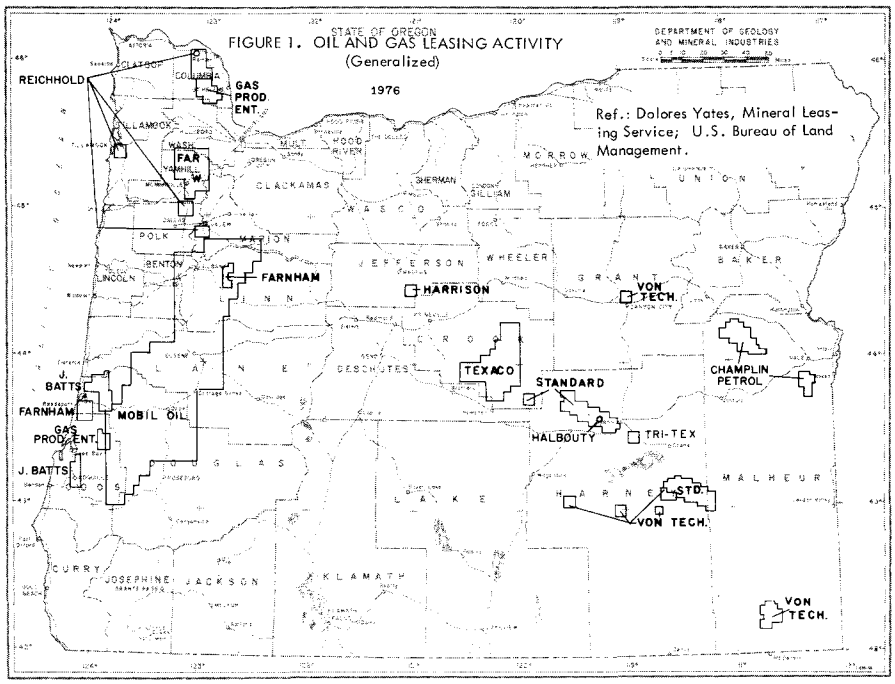
Leasing for oil and gas minerals continued at an active pace in 1976. Two new companies, Champlin Petroleum and Gas Producing Enterprises, both of Denver, Colorado, entered the competition. Champlin is reported to have applied for more than 100,000 acres of Federal leases in the Juntura-Harper area of Malheur County in 1976. Gas Producing Enterprises, Incorporated, began a leasing program in eastern Coos County in October 1976. Mobil Oil Company continued adding to its 700,000-acre lease holdings in southwestern Oregon; Texaco, Incorporated, added to its acreage in central Oregon; and Standard Oil of California enlarged its lease blocks in eastern Oregon during the year. Independents Ericc Von Tech, Farnham Chemical Company, and Reichhold Energy Corporation continued to build lease positions during the year. This current onshore activity may surpass all earlier exploration surges in Oregon. Large onshore exploration programs were undertaken here in 1945-46, 1952-57, and 1960-63. The offshore area was examined during the 1961-69 period when oil companies spent

more than $60 million to test promising shelf structures. No commercial discoveries of oil or gas have been made in Oregon to date.

Estimates of oil and gas lease holdings or applications for leases in the State are listed here by lessees; the major portion of leases are on Federally owned lands. (See Figure 1.)

Batts, John	Billings, Mont.	60,000 acres
Champlin Petroleum Co.	Englewood, Colo.	100,000
Far West Oil Co.	Portland, Ore.	10,000
Farnham Chemical Co.	Portland, Ore.	15,000
Gas Producing Enterprises	Denver, Colo.	15,000
R.F. Harrison	Seattle, Wash.	5,000
Mobil Oil Co.	Denver, Colo.	700,000
Reichhold Energy Corp.	Tacoma, Wash.	30,000
Standard Oil of Calif.	San Francisco, Calif.	200,000
Texaco, Inc.	Los Angeles, Calif.	200,000
Tri-Tex	Sidney, Neb.	5,000
Ericc Von Tech	Coos Bay, Ore.	15,000

Between 1964 and 1967 seven deep holes were drilled off the Oregon coast, and an eighth hole was redrilled because of mechanical problems. These drillings revealed no discoveries, but shows of hydrocarbons appeared. Data from deep drilling and geophysical surveys indicate that prospective marine sedimentary rocks extend to a depth of 20,000 feet below the ocean floor at some locations. The main discouraging factor encountered was the lack of sand strata which could serve as a reservoir for fluid hydrocarbons.



OCS Geophysical Permits, 1976

Company	Address	Permit No.	Expiration Date
Aero Service	Houston, Tex.	OCS 75-29	10/20/76
BBN Geomarine Services	Oxnard, Calif.	OCS 75-30	12/01/76
Shell Oil Co.	Los Angeles, Calif.	OSC 75-27	09/30/76
Texaco, Inc.	Los Angeles, Calif.	OCS 64-13	11/06/76
Western Geophysical	Englewood, Colo.	OCS 75-24	09/23/76

Research Triangle Institute, North Carolina, under contract with the U.S. Bureau of Land Management, held a regional workshop at the Portland Hilton Hotel December 15-17, 1976 to discuss neccessary studies preliminary to leasing Pacific Coast shelf lands for oil and gas development. The USBLM contemplates calling for nominations in January 1977. If industry expresses interest in the Pacific Coast, certain areas will be offered for lease late in 1978. Estimate of lag time to possible production from the date of offering is from 6 to 8 years. The delay will be due to environmental review and to the physical means of finding petroleum. It will be 1985 at the earliest before any possible commercial production reaches the Oregon shore. Such additional oil and gas would come at a time when the U.S. is importing more than one-half of the petroleum products it will be using.

* * * * *

GEOLOGIC QUADRANGLE MAPS PUBLISHED

Three geologic maps covering a block of six quadrangles in Lincoln and adjacent counties have been published by the U.S. Geological Survey as part of its Miscellaneous Investigations Series. Authors are P.D. Snavely, Jr., N.S. MacLeod, H.C. Wagner, and Weldon Rau. Their work represents considerable refinement in stratigraphic interpretation over the maps of this series published in 1949 under the Survey's Oil and Gas Investigations series (OM 88 and 97). The three multicolor maps include cross sections and descriptions of units. The scale is 1:62,500. Each map is for sale for $1.00 by the U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225.

Map I-866. Geologic map of the Waldport and Tidewater quadrangles, Lincoln, Lane, and Benton Counties, Oregon.

Map I-867. Geologic map of the Yaquina and Toledo quadrangles, Lincoln County, Oregon.

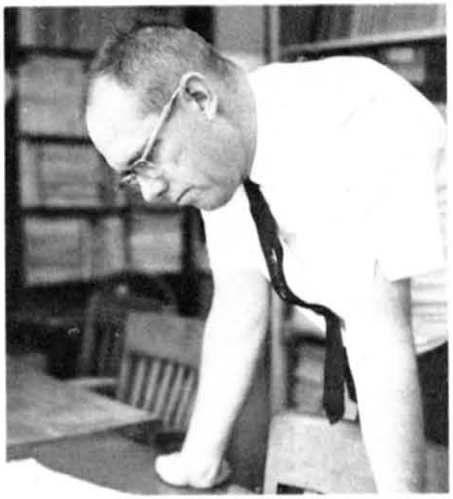
Map I-868. Geologic map of the Cape Foulweather and Euchre Mountain quadrangles, Lincoln County, Oregon.

* * * * *

CHANGE OF HORSES IN MIDWINTER

On February 1 Raymond E. Corcoran, State Geologist for Oregon since 1969, became Special Assistant for Environmental Assessment under the U.S. Bureau of Mines' Associate Director of Mineral and Materials Research and Development in Washington, D.C.

Corcoran, known as "Andy," had been with the Oregon Department of Geology and Mineral Industries since 1953, except for a 4-year period (1957-60) working on bauxite deposits for Harvey Aluminum Co. After rejoining the Department he began a program of coordinating and furthering the State Geologic Map Program for the eastern half of Oregon.



R.E. (Andy) Corcoran

In 1969 Corcoran was appointed State Geologist, succeeding Hollis Dole. Under Corcoran's direction the Department has broadened its services to the State and has added new field offices in Albany and Corvallis. Significant research to promote use of geothermal heat as an alternate energy source was initiated during his administration. The Department's contributions to the State during Andy's tenure are symbolized by more than 50 informative bulletins, maps, and other published materials.

Ralph S. Mason now fills the position of State Geologist. Mason joined the Department as mining engineer in 1943 and continued in that position until 1971, when he was made Deputy State Geologist to assist Corcoran in carrying out the Department's rapidly expanding responsibilities. Ralph is well known to hundreds of Oregonians and others who have attended his geology classes, listened to his lectures and TV talks, and obtained his patient and friendly advice on all aspects of mining and prospecting.

Ralph S. Mason

As director of the Oregon Department of Geology and Mineral Industries, Ralph will carry on the Department's main objectives to conduct studies and publish reports involving the search for energy resources, the location and conservation of mineral resources, and the mapping of geologically hazardous conditions as a basis for land use planning.

CORRECTION: DESCHUTES VALLEY EARTHQUAKE REPORT

Please correct the coordinates for two stations listed on Table 1, page 155, October 1976 ORE BIN to read as follows:

OMW Omak, WA 48.480 N. lat., 119.561 w. long.
GMW Gold Mt., WA 47.548 N. lat., 122.786 w. long.

* * * * *

EAGLE CAP WILDERNESS GETS MINERAL SURVEY

Geological Survey Bulletin 1385-E describes a mineral survey of the Eagle Cap Wilderness, Oregon, proposed additions, and adjoining areas. The report states that 1,500 mining claims have been located in the wilderness area, although the only production is of gold from the Cornucopia district. More than $15 million in gold, silver, and copper have been produced from this district. However, the workings are now inaccessible. According to the bulletin, existing maps and records suggest that significant resources of gold may still be present.

The report points out that silver and lead occur in a quartz vein just beyond the north boundary of the area. The vein is estimated to contain 68,000 tons of material with 0.03 ounces of gold per ton, 0.71 ounces silver per ton, and 2.90 percent lead. Significant concentrations of copper may occur in certain parts of the area, according to the report.

* * * * *

OIL AND GAS LEASES ISSUED BY BLM IN EASTERN OREGON

Twelve oil and gas leases covering 26,818 acres in northwestern Harney County, Oregon have been issued to Standard Oil Co. of California by the Bureau of Land Management.

Murl W. Storms, BLM's Oregon state director, has announced that these leases, effective December 1, 1976, are the first of their kind issued in eastern Oregon since enactment of the National Environmental Policy Act (NEPA) in 1970

The area that Michel T. Halbouty, a Texas independent, plans to drill, under a "farm-out" agreement with Standard, is believed to be included in theleased land.

* * * * *

KNOW YOUR ORE BIN EXPIRATION DATE? Check the back cover of the October 1976 copy and make note. Renew in time to avoid "losing" an issue!

* * * * *

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35. Geology of Dallas and Valsetz quadrangles, Oregon, rev. 1964: Baldwin	3.00
36. Papers on Tertiary foraminifera: Cushman, Stewart and Stewart, 1949: v. 2,	1.25
39. Geol. and mineralization of Morning mine region, 1948: Allen and Thayer	1.00
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