OREGON GEOLOGY

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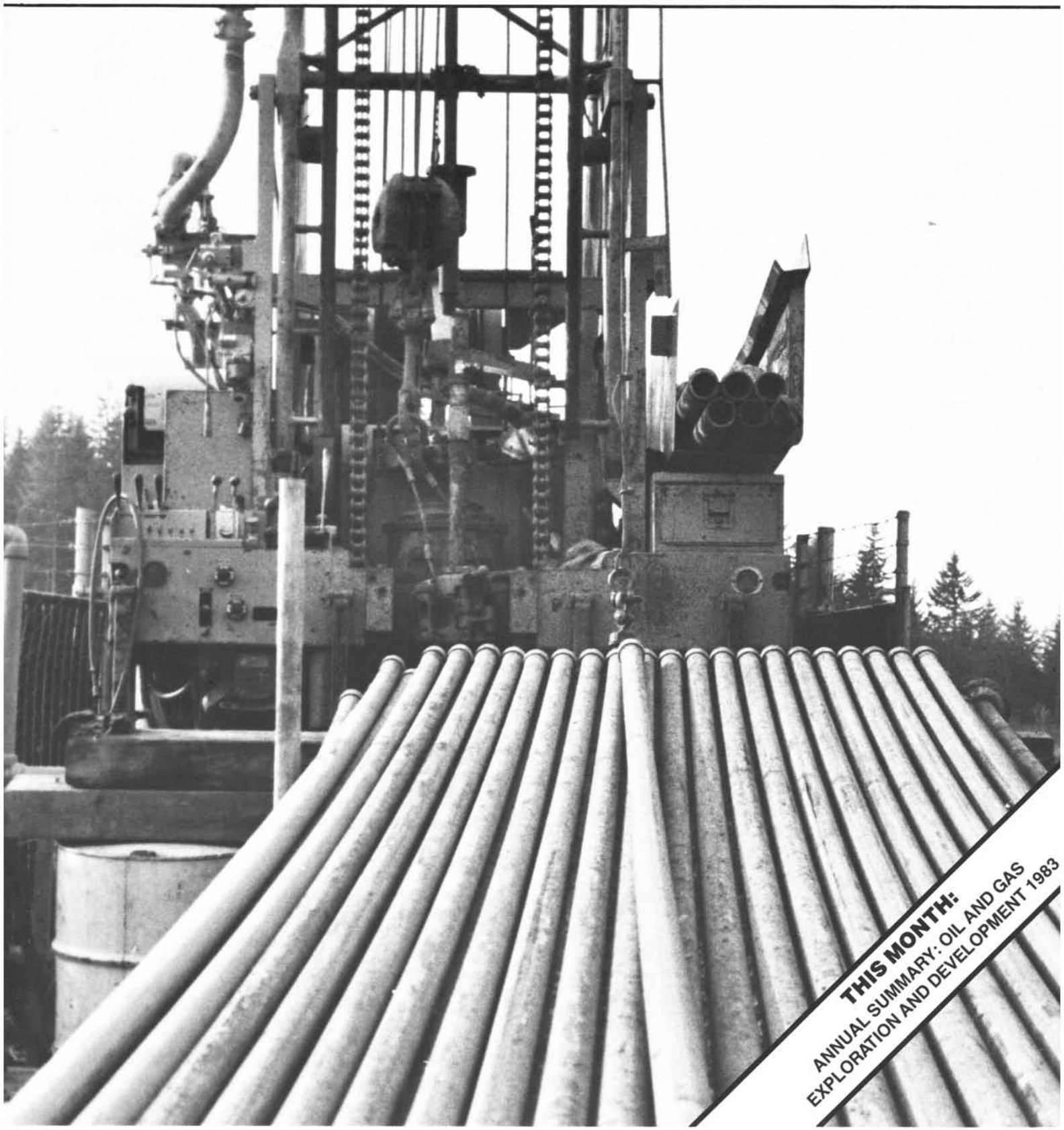

THIS MONTH:
ANNUAL SUMMARY: OIL AND GAS EXPLORATION AND DEVELOPMENT 1983

OREGON GEOLOGY

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COVER PHOTO

Jannsen Drilling Company workover rig at Reichhold Longview Fibre 12-33 in Mist Gas Field. Article beginning on next page summarizes oil and gas activity in Oregon during 1983.

OIL AND GAS NEWS

New producers at Mist Gas Field

On February 20, 1984, Reichhold Energy spudded Columbia County 43-22 in sec. 22, T. 6 N., R. 5 W. The well, an offset to the recently completed Columbia County 23-22, was drilled and completed to production on February 29. The total depth is 2,252 ft, and the initial production was 1.3 million cubic feet per day.

DOGAMI Board Meeting

At the February 27, 1984, meeting of the Governing Board, one agenda item concerned the proposal by Reichhold Energy to drill Columbia County 13-34A in the Mist Gas Field. The proposed well would be in a spacing unit where a producer already exists. Testimony from a January 17, 1984, hearing was discussed, and the Board voted to permit the drilling of the new well.

Recent permits

Permit no.	Operator, well, API number	Location	Status, proposed total depth (ft)
258	Reichhold Energy Corp. Crown Zellerbach 34-28 009-00126	SE¼ sec. 28 T. 6 N., R. 4 W. Columbia County	Application; 2,500.
259	Hutchins & Marrs Great Discovery 2 019-00023	NW¼ sec. 20 T. 30 S., R. 9 W. Douglas County	Application; 3,500.

□

Former Governing Board Chairman dies

Fayette Ingalls Bristol, former member and chairman of the Governing Board of the Oregon Department of Geology and Mineral Industries (DOGAMI) between 1961 and 1972 died in Lincoln City on Sunday, February 26, 1984.

Born in Hillsdale, Michigan, Bristol attended Michigan State University, where he studied mining engineering. After moving to Oregon, he began his own company, Oregon Lime Products, in Williams. He later started Bristol Silica Company in Rogue River. From 1967 to 1978, he owned and operated the Bristol Chemical Company in Portland.

During his lifetime, Bristol was also deeply involved in politics and civic affairs. He served as state representative from Josephine County from 1956 to 1959. He was appointed by then Governor Mark Hatfield to the DOGAMI Governing Board on April 1, 1961, and was reappointed by Hatfield to a second term. He was reappointed to a third term by then Governor Tom McCall and served as chairman during that term. He was also president of the Oregon Mining Association and a member of the Society of Mining Engineers.

Bristol is survived by two daughters, two sons, a sister, and four grandchildren. □

CONTENTS

Oil and gas exploration and development in Oregon, 1983

by William L. King, Oregon Department of Geology and Mineral Industries

ABSTRACT

Leasing decreased and terminations increased during 1983. Drilling decreased 44 percent compared to last year. Two new operators were active in the state, drilling in the Willamette Valley and in the southern Coast Range. Mist Gas Field production continued at a strong rate. A new pool was discovered 1½ mi from the nearest Mist producing well. Injection began into Oregon's first salt-water disposal well. The Mist Gas Field boundaries were enlarged. The Governing Board considered various issues. Three oil and gas hearings were held. The Northwest Association of Petroleum Landmen changed its name. Seismic permitting was active.

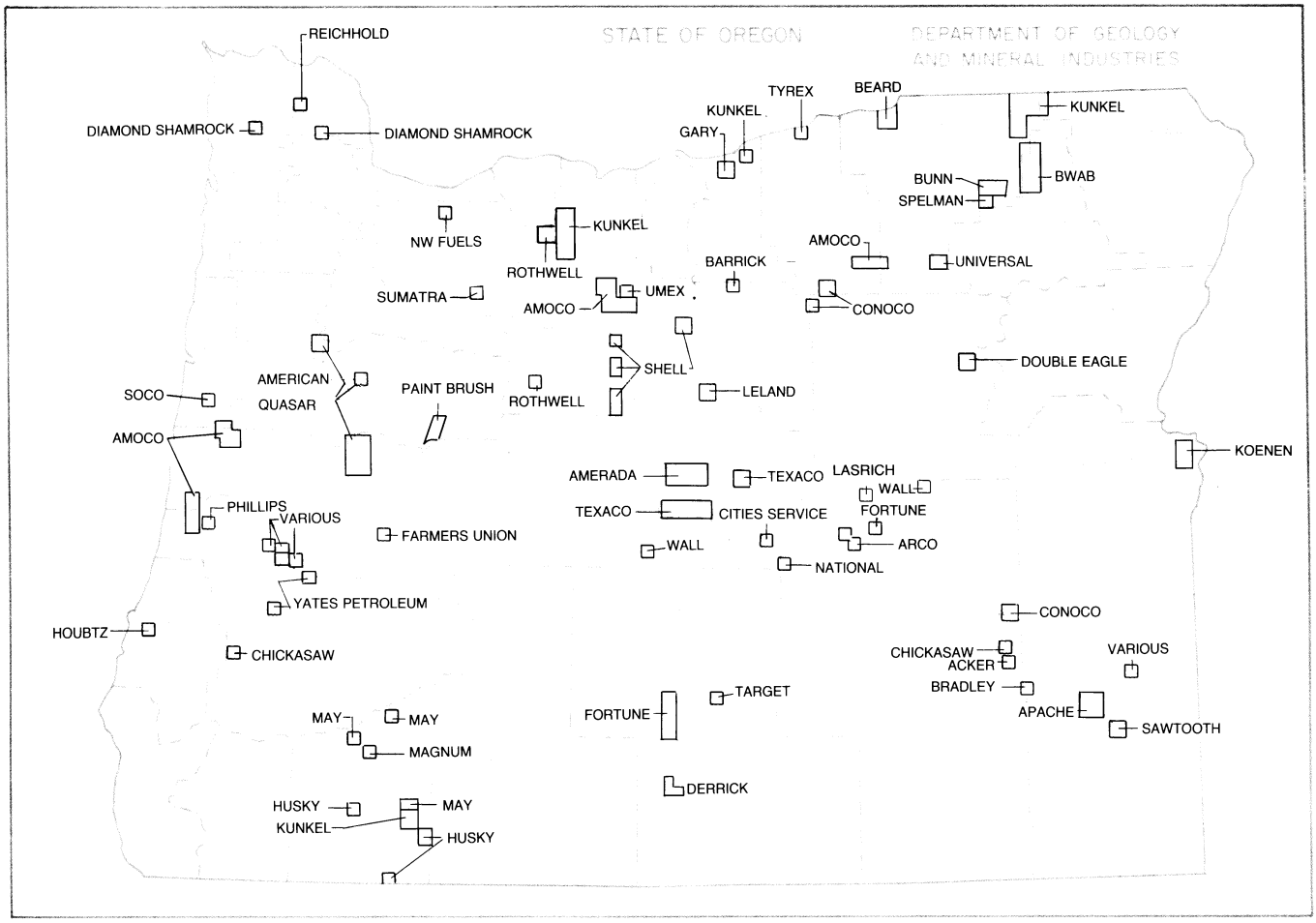
LEASING ACTIVITY

Leasing of federal land in Oregon for oil and gas exploration decreased in 1983. There were fewer applications than in 1982. The number of leases issued also decreased, with a total 310 comprising 675,050 acres as compared to 2,249 comprising 6.9 million acres for the previous year.

Bureau of Land Management (BLM) leases issued on land where there are no known producing geological structures are subdivided into over-the-counter (OTC) leases and simultaneous oil and gas (SOG) leases. OTC leases are granted on new applications. SOG leases are granted on property previously leased but then expired, canceled, relinquished, or terminated. Every OTC expiration must be reprocessed through the SOG program. In October, however, the SOG program was closed for an undetermined period, which accounts for the lull in OTC leasing.

Terminations increased during 1983. Historically, terminations average 10 to 20 leases per month. During July and August, however, this increased to an average of 300 per month, due probably to the inability of speculators to find buyers before the rental payments were due. The first year's rental, which is submitted when the application is filed, is credited when the lease is issued. If buyers are not found before the second year's due date, many leases are dropped. At year's end, 2,373 leases totaling 5,987,386 acres of federal land were under lease in Oregon.

No oil and gas lease sales were held during 1983 by the Oregon Division of State Lands. At the end of the year, 780 leases were in effect on state lands, comprising a total of 320,000 acres, a decrease of 24,000 acres from the previous year. This is a very small rate of surrender, considering the general industry trend. Counties with the most remaining leased acres are Clatsop, 78,000 acres; Coos, 58,000 acres; Malheur, 54,000 acres; Douglas, 30,000 acres; and Harney, 26,000 acres. Total lease rental income for the year

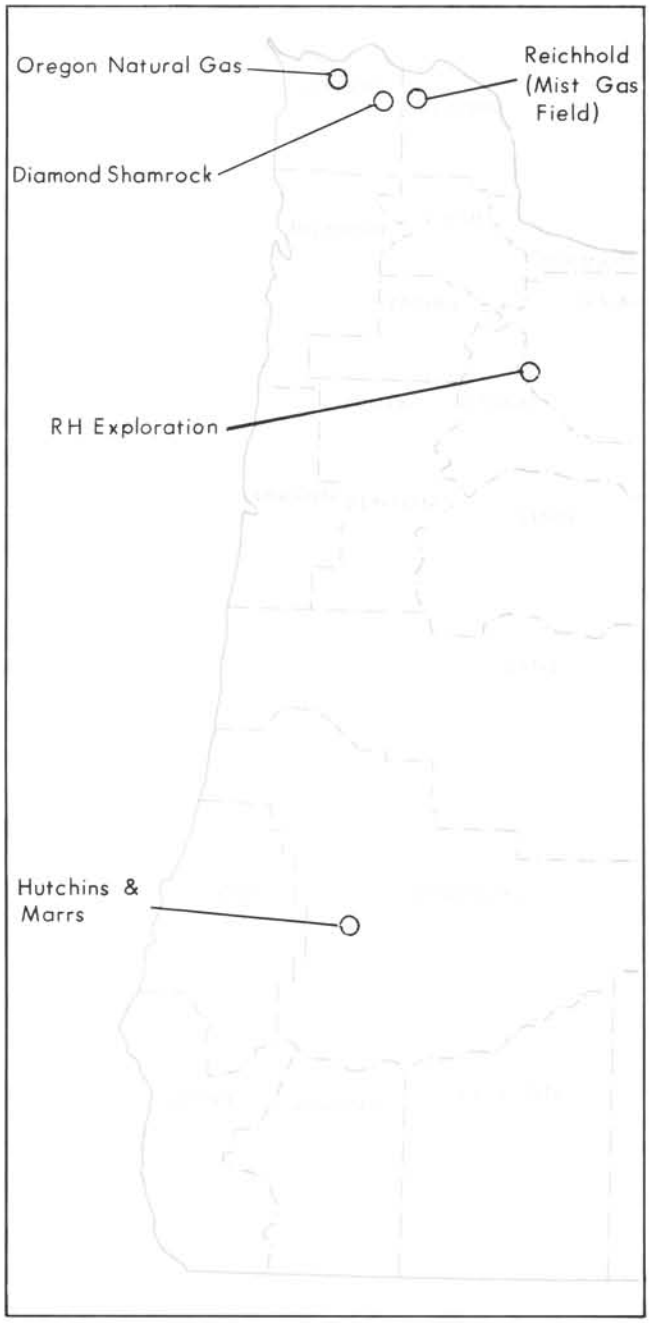


Oil and gas leases obtained in Oregon, 1983. Lease data courtesy Dolores Yates, LANDATA Reporting and Services.

Table 1. *Oil and gas permits and drilling activity in Oregon, 1983*

Permit no.	Operator, well API number	Location	Status, depth (ft) TD = total depth PTD = proposed TD; RD = redrill
199	Oregon Natural Gas Dev. Patton 32-9 007-00011-01	NE¼ sec. 9 T. 7 N., R. 8 W. Clatsop County	Abandoned, dry hole; RD: 3,917.
208	Reichhold Energy Wilson 11-5 009-00099	NW¼ sec. 5 T. 6 N., R. 5 W. Columbia County	Suspended; TD: 2,827.
226	Diamond Shamrock Watzek 22-19 007-00012	NW¼ sec. 14 T. 6 N., R. 6 W. Clatsop County	Abandoned, dry hole; TD: 5,190.
227	Diamond Shamrock State of Oregon 23-33 007-00013	NE¼ sec. 33 T. 6 N., R. 7 W. Clatsop County	Permit issued; PTD: 7,000.
228	Reichhold Energy Columbia County 23-28 009-00111	SW¼ sec. 28 T. 7 N., R. 5 W. Columbia County	Permit issued; PTD: 2,600.
229	Reichhold Energy Columbia County 23-35 009-00112	SW¼ sec. 35 T. 7 N., R. 5 W. Columbia County	Permit issued; PTD: 2,800.
230	Reichhold Energy Columbia County 14-33 009-00113	SW¼ sec. 33 T. 7 N., R. 5 W. Columbia County	Abandoned, dry hole; TD: 3,105.
231	Reichhold Energy Longview Fibre 23-12 009-00114	SW¼ sec. 12 T. 6 N., R. 5 W. Columbia County	Permit issued; PTD: 3,000.
232	Reichhold Energy Polak 31-12 009-00115	NE¼ sec. 12 T. 6 N., R. 5 W. Columbia County	Permit issued; PTD: 3,000.
233	Diamond Shamrock Clatsop County 33-11 007-00014	SE¼ sec. 11 T. 6 N., R. 6 W. Clatsop County	Abandoned, dry hole; TD: 4,223.
234	Reichhold Energy Werner 34-21 047-00014	SE¼ sec. 21 T. 5 S., R. 2 W. Marion County	Permit issued; PTD: 3,500.
235	Diamond Shamrock Watzek Trust 23-4 007-00015	SW¼ sec. 4 T. 6 N., R. 6 W. Clatsop County	Permit issued; PTD: 6,000.
236	Diamond Shamrock Watzek Trust 31-4 007-00016	NE¼ sec. 4 T. 6 N., R. 6 W. Clatsop County	Permit issued; PTD: 6,000.
237	Reichhold Energy Columbia County 23-22 009-00116	SW¼ sec. 22 T. 6 N., R. 5 W. Columbia County	Completed, gas; TD: 2,028.
238	Leavitt Exploration Maurice Brooks 1 039-00005	NE¼ sec. 34 T. 19 S., R. 3 W. Lane County	Permit issued; PTD: 3,000.
239	Petrol. & Min. Analysis Keech 1 047-00015	NE¼ sec. 15 T. 9 S., R. 2 W. Marion County	Permit issued; PTD: 3,600.
240	RH Exploration Rose 1 005-00002	NE¼ sec. 20 T. 5 S., R. 1 E. Clackamas Co.	Suspended; PTD: 3,500.
241	RH Exploration Anderson 1 005-00003	SW¼ sec. 29 T. 5 S., R. 1 E. Clackamas Co.	Suspended; PTD: 3,500.
242	RH Exploration Rose 2 005-00004	SW¼ sec. 20 T. 5 S., R. 1 E. Clackamas Co.	Application; PTD: 4,000.
243	Reichhold Energy Investment Manage- ment 21-20 009-00117	NW¼ sec. 20 T. 6 N., R. 4 W. Columbia County	Abandoned, dry hole; TD: 2,505.
244	Hutchins & Marrs Lord's Will 1 019-00018	SW¼ sec. 3 T. 27 S., R. 7 W. Douglas County	Permit issued; PTD: 4,000.
245	Hutchins & Marrs Lord's Will 2 019-00019	SE¼ sec. 34 T. 26 S., R. 7 W. Douglas County	Permit issued; PTD: 4,000.
246	Hutchins & Marrs Lord's Will 3 019-00020	NE¼ sec. 3 T. 27 S., R. 7 W. Douglas County	Permit issued; PTD: 4,000.
247	Hutchins & Marrs Glory Hole 1 019-00021	NW¼ sec. 10 T. 27 S., R. 7 W. Douglas County	Suspended; TD: 2,987.
248	Reichhold Energy Crown Zellerbach 33-26 009-00118	SE¼ sec. 26 T. 6 N., R. 4 W. Columbia County	Permit issued; PTD: 4,000.
249	Reichhold Energy Busch 14-15 009-00119	SW¼ sec. 15 T. 6 N., R. 5 W. Columbia County	Permit issued; PTD: 2,800.
250	Reichhold Energy Longview Fibre 33-36 009-00120	SE¼ sec. 36 T. 6 N., R. 5 W. Columbia County	Permit issued; PTD: 4,000.
251	Reichhold Energy Grimsbo 11-16 009-00121	NW¼ sec. 16 T. 6 N., R. 5 W. Columbia County	Permit issued; PTD: 2,600.
252	Hutchins & Marrs Great Discovery 1 019-00022	SE¼ sec. 3 T. 27 S., R. 7 W. Douglas County	Permit issued; PTD: 4,500.
253	Reichhold Energy Adams 32-34 009-00122	NE¼ sec. 34 T. 7 N., R. 5 W. Columbia County	Permit issued; PTD: 2,800.
254	Oregon Nat. Gas Dev. Dougherty 1-21 049-00001	NE¼ sec. 21 T. 1 S., R. 27 E. Morrow County	Permit issued; PTD: 10,000.
255	Reichhold Energy Columbia County 13-34A 009-00123	SW¼ sec. 34 T. 7 N., R. 5 W. Columbia County	Application; PTD: 2,800.

Christmas tree and cellar, Reichhold Columbia County 23-22, Oregon's latest discovery in the Mist Gas Field.



Oil and gas drilling sites in Oregon, 1983. All drilling was in western Oregon.

amounted to $356,000, which includes rentals from 31,202 acres under lease option to Mobil Oil.

State law authorizes a county court to execute an oil and gas lease involving county-owned mineral rights through a process of advertising with subsequent competitive bidding. Leases are granted to the highest bidder. Douglas County held a lease auction in December. One block of 9,921 acres west and southwest of Roseburg was offered. A bid of $1.25 per acre for a lease term of five years was offered and accepted, there being no opposing bids. Selmar H. Hutchins was the successful bidder. Prior to this auction, the county had held no oil and gas lease auctions since 1978, when Mobil Oil leased acreage there.

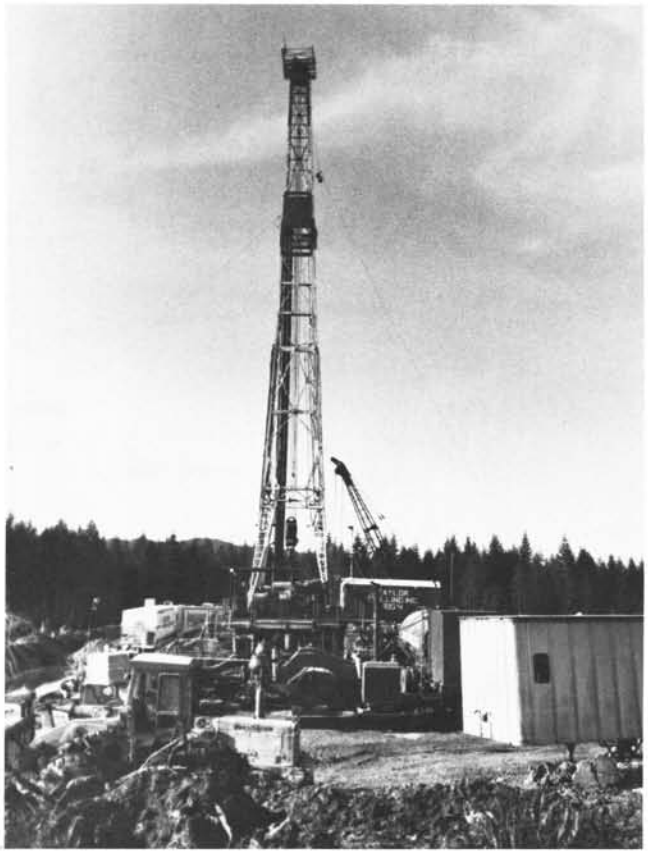
DRILLING ACTIVITY

During 1983, 10 oil and gas test wells were drilled in Oregon. This was a decrease of eight wells, or 44 percent, compared to the preceding year, 1982. Twenty-nine oil and gas drilling permits were issued in 1983, however, an increase of 81 percent over the preceding year, indicating industry's continued interest in Oregon's hydrocarbon potential.

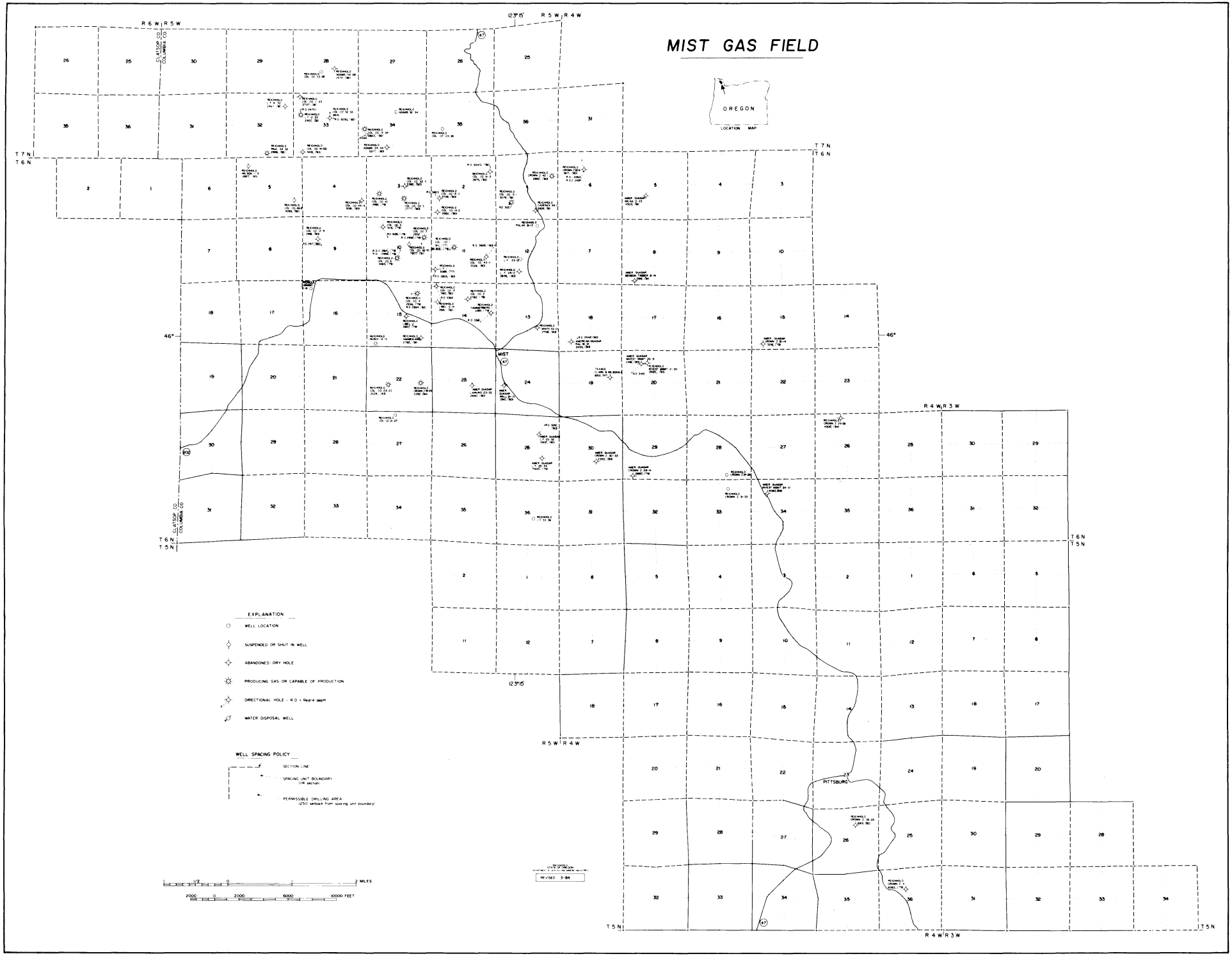
Most of the drilling was in Columbia and Clatsop Counties, in the northwest part of the state, by established operators. Reichhold Energy Corporation led the activity with four wells drilled in the Mist Gas Field area. Three of these wells were dry holes, but one, Columbia County 23-22, was completed as a gas well. Diamond Shamrock Corporation, which was recently renamed Diamond Chemicals Company, continued its exploration effort in Clatsop County by drilling two wells with a combined total footage of 9,413 ft. This brings the total number of Diamond Shamrock wells drilled in Clatsop County since 1981 to five, with a combined total footage of 29,072 ft. Oregon Natural Gas Development Corporation Patton 32-9, located east of Olney in Clatsop County, was redrilled to 3,917 ft in an unsuccessful attempt to establish production. This redrill footage, combined with Oregon Natural Gas Development Corporation's previous Clatsop County drilling, brings its total footage in the county to 22,050 ft since 1981.

Two new operators were active in other areas in Oregon in 1983. RH Exploration drilled two wells in the Willamette Valley, east of Monitor in Clackamas County, and Hutchins and Marrs drilled one well west of Melrose in Douglas County.

The deepest hole drilled in Oregon in 1983 was by Diamond Shamrock to a total depth of 5,190 ft. The average well depth for the year was 3,164 ft. Total footage drilled was 31,635 ft, a decrease of 53 percent from 1982's total. Sixty percent of the wells drilled were wildcats. The remainder were in the Mist Gas Field area.



Taylor Drilling Company rig at Diamond Shamrock Clatsop County 33-11 location.



Mist Gas Field, as revised by DOGAMI Governing Board in November 1983. This map is available at a much larger scale (1:24,000) on a 40×50-in. sheet as DOGAMI Open-File Report 0-84-2 (cost $5).

INSERT

April 2, 1984

Dear Oregon Geology reader,

We are trying to evaluate the usefulness and effectiveness of Oregon Geology. We would also like to know more about our readers. We would appreciate it if you would complete this questionnaire and return it to us within a month. This is your opportunity to tell us what you want--or need--from Oregon Geology, so please be candid.

1. Where do you live? _____
2. How long have you subscribed to Oregon Geology? _____
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4. Check categories below that describe you.

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	____ News media representative
____ Legislator	____ Amateur geologist or paleontologist
____ Recreational miner (rockhounding, weekend placering, mineral collecting)	____ Prospector or explorationist
	____ Mine developer, owner, or operator
____ Gemstone miner, dealer, or cutter	____ Other mineral industry employee
____ Oil and gas industry employee	____ Geothermal industry employee

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_____ Very little _____ Some, mostly by skimming
_____ Only read papers of interest to me _____ Read most _____ Read all

6. Some of the material in Oregon Geology is very technical; some is not. How would you rate the content and style of writing in papers and articles that interest you?

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_____ Annual summaries of oil and gas, mineral, mined-land reclamation, and geothermal activity	
_____ Monthly oil and gas news	_____ Plate tectonics
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_____ Meeting announcements	_____ Oil and gas exploration and development
_____ Geology	_____ Meteorites
_____ Book reviews	_____ News of people
_____ Industry news	_____ Thesis abstracts
_____ Mineral and gemstone localities	_____ Geology of specific areas; e.g., Blue Mountains, Cascades, state parks, urban areas
_____ Mining history	_____ Legislative news and Governing Board actions
_____ Summaries of geology and mineral resources of various counties	_____ Other (specify)

8. How could Oregon Geology be improved to meet your needs and interests more fully?

_____

_____

9. Is the type too small for you to read? _____
10. Would Oregon Geology be as useful to you if it came out less frequently but with more pages?

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11. Would you accept an increase in cost so that each issue could have more pages, longer articles, and more variety?_____

INSERT

12. Other comments _____

_____

_____

Remove this sheet from your magazine, fold as indicated, tape or staple, stamp with a 20¢ stamp, and send to us. Results will be announced in an upcoming issue of Oregon Geology.

Thank you for your help.

Beverly F. Vogt
Publications Manager

Rather than leave the rest of the questionnaire sheet blank, we are printing our current open-file report list on the rest of the sheet. This list, which is available free of charge from the Portland office of the Oregon Department of Geology and Mineral Industries, is frequently updated as new open-file reports are released. If the reports are still in print and available for sale, the prices are listed.

April 1, 1984	OPEN-FILE REPORTS	Price, if for sale
O-69-1	Analyses of stream-sediment samples from southwestern Oregon. Bowen, 1969, 439 p.	-----
O-70-1	Sand and gravel, Bear Creek and Rogue River Valleys, Jackson County. Schlicker & Deacon, 1970, 49 p.	-----
O-70-2	Gravel resources of the Applegate River area in Jackson County. Schlicker & Deacon, 1970, 17 p.	-----
O-71-1	Folsom Basin disposal site, Klamath County. Newton, 1971, 10 p.	-----
O-71-2	Geologic evaluation of Alkali Lake disposal site. Newton & Baggs, 1971, 90 p.	-----
O-71-3	Engineering geology of La Grande and vicinity. Schlicker & Deacon, 1971, 16 p., 1 map	-----
O-72-1	Mineral resource status of state-owned lands in Malheur County. Wagner, 1972, 27 p., 41 maps.	-----
O-73-1	Geologic criteria for siting nuclear power plants in Oregon. Newton & Peterson, 1973, 65 p., 7 maps	-----
O-74-1	A preliminary geological investigation of the ground effects of earthquakes in the Portland metropolitan area, OR. Hammond & others, 1974, 40 p.	-----
O-75-1	A review of geological conditions at the Pebble Springs nuclear plant site. Newton & Peterson, 1975, 15 p.	-----
O-75-2	Central Western and High Cascades geological reconnaissance and heat flow hole location recommendations. Peterson & Youngquist, 1975, 41 p.	5.00
O-75-3	Geothermal gradient data for Oregon. Bowen, 1975, 134 p., 1 map	10.00
O-75-4	Geothermal gradient data, Vale area, Malheur County, OR. Hull, 1975, 18 p.	5.00
O-75-5	A preliminary annotated bibliography of the geology of Mount Hood. McCarthy, 1975, 9 p.	5.00
O-75-6	Economic factors affecting the mining, processing, gasification, and marketing of Coos Bay coals. Mason & Hughes, 1975, 61 p., 4 maps	13.00
O-75-7	Geothermal studies and exploration in Oregon. Bowen & others, 1975, 65 p., 2 Ore Bins	5.00
O-75-8	An estimate of southeast Oregon's geothermal potential. Fisher, 1975, 9 p.	-----
O-75-9	Aggregate resources of Josephine County. Schlicker & others, 1975, 47 p., 28 maps	-----
O-76-1	Electrical resistivity survey and evaluation of the Glass Buttes geothermal anomaly, Lake County. (Appendix: Reconnaissance dipole-dipole resistivity survey in the Glass Buttes area). Phoenix Geophysics, Inc., 1976, 26 p., 5 plates	8.00
O-76-2	Geothermal gradient data, Brothers fault zone, Oregon. Hull & others, 1975, 24 p.	5.00
O-76-3	Ferruginous bauxites of the Pacific Northwest, Hook, 1976, 26 p.	5.00
O-76-4	Stream-sediment geochemistry, northeastern Oregon. DOGAMI, 1976, 47 p., 33 maps	25.00
O-76-5	Preliminary report on the reconnaissance geology of the upper Clackamas and North Santiam Rivers area, Cascade Range. Hammond, 1976, 115 p.	-----
O-76-6	Engineering geology of the John Day area, Grant County. Schlicker & Brooks, 1976, 31 p., 1 map	5.00
O-77-1a	Preliminary geologic map of the Sawtooth Ridge quadrangle. Brooks & others, 1977	5.00
O-77-1b	Preliminary geologic map of the Keating NW quadrangle. Brooks & others, 1977.	5.00
O-77-2	Geothermal gradient data for Oregon. Hull & others, 1977, 134 p.	5.00
O-77-3	Heat flow study of the Brothers fault zone, OR. Hull & others, 1977, 110 p.	5.00
O-77-4	Geologic restraints to development in selected areas of Marion County. Schlicker, 1977, 59 p.	5.00
O-77-5	Reconnaissance geologic map of the Virtue Flat quadrangle. Brooks & McIntyre, 1977	5.00
O-77-6	Preliminary geologic map of the Baker quadrangle. Brooks, 1977.	5.00
O-78-1	Geologic hazards review, Trojan nuclear plant site, Columbia County, OR. DOGAMI, 1978, 35 p..	5.00
O-78-2	Supplement to the Feb. 11, 1974, Pebble Springs review. Newton & Peterson, 1978, 25 p.	5.00
O-78-3	Preliminary geologic map of the Bowen Valley quadrangle. Brooks & McIntyre, 1978.	5.00
O-78-4	Geothermal gradient data for Oregon. Hull & others, 1978, 187 p., 1 map	5.00
O-78-5	Reconnaissance study of Oregon's stone quarries and asbestiform minerals occurrences within 10 mi of serpentinite. Gray, 1978, 40 p.	5.00
O-78-6	Geophysical logs, Old Maid Flat 1, Clackamas County. DOGAMI, 1978, 7 borehole logs, 2 p.	-----
O-79-1	Annotated bibliography of the geology of the Columbia Plateau (Columbia River basalt) and adjacent areas of Oregon. Bela, 1979, 744 p.	20.00

O-79-2	Geochemical studies of rocks, water, and gases at Mount Hood. Wollenberg & others, 1979, 57 p.	5.00
O-79-3	Chemical analyses of thermal springs and wells in Oregon. USGS & DOGAMI, 1979, 169 p.	5.00
O-79-4	Mineral resources maps and indexes of geologic mapping (pre-1960 and 1960-1979) of AMS sheets. Hollis (Rockwell Hanford Operations), 1979, 10 maps	-----
O-79-5	Micropaleontological study of four deep wells in Coos County, OR. McKeel, 1979, 26 p.	5.00
O-79-6	Geologic map of the Bullrun Rock quadrangle. Brooks & Fern, 1979	5.00
O-79-7	Geologic map of the Rastus Mountain quadrangle. Brooks & Fern, 1979	5.00
O-79-8	Geothermal resource assessment of Mount Hood. Riccio, ed., 1979, 273 p., 5 maps	-----
O-79-9	Annual report of the State Map Advisory Committee for Oregon. Beaulieu, 1979, unpag.	-----
O-80-1	Micropaleontological study of five wells, western Willamette Valley. McKeel, 1980, 21 p..	5.00
O-80-2	*Preliminary geology and geothermal resource potential of the* Belknap-Foley area, OR. Brown & others, 1980, 58 p., 1 map	5.00
O-80-3	-----Willamette Pass area, OR. Brown & others, 1980, 65 p., 1 map	5.00
O-80-4	-----Craig Mountain-Cove area, OR. Brown & others, 1980, 68 p., 1 map	5.00
O-80-5	-----Western Snake River plain, OR. Brown & others, 1980, 114 p., 4 maps.	10.00
O-80-6	-----northern Harney Basin, OR. Brown & others, 1980, 52 p., 4 maps	7.00
O-80-7	-----southern Harney Basin, OR. Brown & others, 1980, 90 p., 8 maps	10.00
O-80-8	-----Powell Buttes area, OR. Brown & others, 1980, 117 p., 1 map	5.00
O-80-9	-----Lakeview area, OR. Peterson & others, 1980, 108 p., 2 maps	7.00
O-80-10	-----Alvord Desert area, OR. Peterson & Brown, 1980, 57 p., 2 maps	7.00
O-80-11	Engineering and air and mud drilling data, DOGAMI well Old Maid Flat 7A, DOGAMI, 1980, 1 sheet, folded into 16 p.	-----
O-80-12	Geothermal gradient drilling, north-central Cascades of Oregon, 1979. Youngquist, 1980, 47 p., 2 gamma-ray logs.	5.00
O-80-13	Lithologic logs of 11 wells and foraminiferal species lists of 4 wells in southwestern Oregon (accompanies *Oil and Gas Investigation 6*). DOGAMI & McKeel, 1980, 81 p.	5.00
O-80-14	Progress report on activities of the low-temperature resource-assessment program 1979-80. DOGAMI, 1980, 79 p.	5.00
O-81-1	Annual report of the State Map Advisory Committee for Oregon, 1980. Beaulieu, 1981, 28 p.	-----
O-81-2	Geophysical logs, Old Maid Flat 7A well, Clackamas County. DOGAMI, 1981, 2 parts folded log copies: O-81-2A, 4 logs, shallow (96-1,190 ft); O-81-2B. 2 logs, deep (96-5,952 ft). Set.	100.00
O-81-3	Geothermal gradient data for Oregon. Blackwell & others, 1981, 3 parts:	
	O-81-3A, for 1978, 63 p.	5.00
	O-81-3B, for 1979, 98 p.	6.00
	O-81-3C, for 1980, 374 p.	12.00
O-81-5	Preliminary geologic map, Amity, Mission Bottom quadrangles. Brownfield & Schlicker, 1981.	5.00
O-81-6	Preliminary geologic map, McMinnville, Dayton quadrangles. Brownfield & Schlicker, 1981	5.00
O-81-7	Rock material resources, Marion, Polk, Yamhill, Linn Counties. Gray & Throop, 1981, 47 p., 3 maps.	7.00
O-81-8	Reconnaissance geochemical study, Quartzville mining district. Munts, 1981, 14 p., 1 map.	5.00
O-81-9	Seismic and volcanic hazard evaluation of the Mount St. Helens area, Wash., relative to the Trojan nuclear site, Oreg. Beaulieu & Peterson, 1981, 80 p.	5.00
O-81-10	Post-Columbia River Basalt Group stratigraphy and map compilation of the Columbia River Plateau, Oreg. Shannon/Wilson & DOGAMI, 1981, 79 p., 6 maps	10.00
O-82-1	Annual report of the State Map Advisory Committee for Oregon, 1981. Beaulieu, 1981, 24 p.	-----
O-82-2	Preliminary geologic map, Ballston quadrangle. Brownfield, 1982	5.00
O-82-3	Geologic map, Langlois quadrangle. Brownfield, 1982	5.00
O-82-4	Geothermal gradient data for Oregon (1981). Blackwell & others, 1982, 430 p.	15.00
O-82-5	Final technical report, Oregon low-temperature resource-assessment program. Priest & others, 1982, 54 p.	5.00
O-82-6	Bibliography of landslide deposits for the state of Oregon. Bela, 1982, 40 p.	6.00
O-82-7	Geology and geothermal resources of the Cascades. Priest & Vogt, 1982, 206 p., 5 maps.	-----
O-82-8	Gravity and aeromagnetic maps, Powell Buttes area. OSU Geophysics Group, 1982, 4 maps	8.00
O-82-9	Gravity anomalies in the Cascade Range in Oregon: Structural and thermal implications. OSU Geophysics Group, 1982, 66 p.	5.00
O-83-1	Annual report of the State Map Advisory Committee for Oregon, 1982. Beaulieu, 1983, 29 p.	-----
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O-83-3	Survey of potential geothermal exploration sites at Newberry volcano, Deschutes County. Priest & others, 1983, 174 p., 8 maps.	20.00
O-83-4	Geochemical survey of the western part of the Ochoco National Forest, Crook and Wheeler Counties. Ferns & Brooks, 1983, 38 p., 1 map, 3 microfiche.	6.00
O-83-5	Mineral potential of the Fall Creek mining district: A geological-geochemical survey. Gray & Berri, 1983, 32 p., 1 map, 2 microfiche	6.00
O-83-6	Preliminary geologic map, W. half, Vancouver 1°x 2° quadrangle, Oreg. Wells & others, 1983.	6.00
O-84-1	Annual report of the State Map Advisory Committee for Oregon, 1983. Beaulieu, 1984, 39 p.	2.00
O-84-2	Mist Gas Field map. DOGAMI, 1984, 1 map	5.00
O-84-3		
O-84-4	Heat-flow map of the Cascade Range of Oregon, and index map of mapping in the Oregon Cascades. DOGAMI, 1984, 2 maps.	5.00

GAS PRODUCTION

One well was completed to production during 1983 at the Mist Gas Field. To date, 12 wells have been completed. Of this total, eight are currently producing, one is awaiting pipeline connection, two are shut in, and one has been converted to a salt-water disposal well. During 1983, the number of producing wells varied from six to eight. Production rates during the year ranged from 7.1 to 10.8 million cubic feet per day (cfd). Eight different pools have been designated. One additional pool will be designated for Reichhold Columbia County 23-22, which was completed December 21, 1983. The price of Mist Gas Field gas from the Federal Energy Regulatory Commission price schedule ranged from $3.299 per million British thermal units (MMBtu) to $3.564 per MMBtu, or from $3.09 per thousand cubic feet (Mcf) to $3.34 per Mcf. Beginning in May, however, Mist gas was no longer sold at the federally controlled ceiling price but rather at a monthly negotiated contract price which was lower than the federal price. This contract price ranged from $2.945 per MMBtu to $3.219 MMBtu, or from $2.76 per Mcf to $3.02 per Mcf. Total gas produced in 1983 was 3.16 billion cubic feet. Using federal prices from January through April and contract prices from May through December, the value of this gas was $9.5 million.

NEW POOL DISCOVERY

Reichhold Energy Corporation Columbia County 23-22, located in sec. 22, T. 6 N., R. 5 W., in the Mist Gas Field, was drilled to a total depth of 2,028 ft and completed as a gas well December 21, 1983, flowing 3 MMcfd. This well is 1½ mi south of the nearest producing well and approximately 1 mi south of and 1 mi west of, respectively, the nearest dry holes. No wells have been drilled south or west of Columbia County 23-22. A new pool, the twelfth to date, will be designated for this discovery.

Flaring gas during initial potential test at Reichhold Columbia County 23-22, December 1983.

Reichhold Columbia County 13-1, Oregon's first salt-water disposal well. Vacuum truck in background is transferring salt water to holding tank for injection into the well.

SALT WATER DISPOSAL

A water pollution control facilities permit that was issued in August by the Oregon Department of Environmental Quality (DEQ) to Reichhold Energy Corporation authorized injection of salt water into their Columbia County 13-1 RD located in sec. 1, T. 6 N., R. 5 W., in the Mist Gas Field. This permit, issued in conjunction with the Oregon Department of Geology and Mineral Industries (DOGAMI), authorizes injection of salt water extracted with natural gas into the depleted Clark and Wilson sand from which the well formerly produced. DOGAMI also issued an injection permit. This is the first waste disposal well of this type in Oregon.

Three Reichhold wells, Columbia County 4 RD, Longview Fibre 12-33, and Paul 34-32, are currently producing salt water which is being injected into Columbia County 13-1 RD. A maximum of 1,000 barrels per week is permitted. During 1983, a total of 20,486 barrels was injected.

Welex personnel preparing to run a bridge plug to stop water production at Reichhold Columbia County 4 at Mist Gas Field.

The DEQ permit also authorizes the spreading of salt water on unpaved roads and along road rights-of-way during summer months under dry conditions. Restrictions are included in this phase of the disposal process to prevent stream pollution or damage to vegetation. During 1983, a total of 10,666 barrels was disposed of by surface spreading.

MIST GAS FIELD BOUNDARIES

The boundaries of the Mist Gas Field were changed in November by DOGAMI's Governing Board. Prior to this action, the official boundaries had never been designated. After the previously accepted boundaries were revised at a public hearing, the new boundaries were approved by the Governing Board. The effect will be to increase the field area from 42 to 141 sq mi, thereby enlarging the area within which special setback distances apply. The statewide setback distance is 500 ft from a quarter section boundary. The Mist Gas Field distance is 250 ft. A reduced version of the revised Mist Gas Field map is printed with this article. The new map is also available at a scale of 1:24,000 as DOGAMI Open-File Report O-84-2, *Mist Gas Field Well Location Map* (cost $5), at the Department's Portland office. This map replaces the old map in Open-File Report O-81-4, which is no longer available.

OTHER

DOGAMI's Governing Board met five times during 1983. Various issues considered were an appeal on the compulsory integration rule, unlawful well abandonment, request for suspended well status, bond releases, a memorandum of understanding with DEQ regarding underground injection, field boundaries designation, amending orders, petitions to distribute revenues, and adoption of administrative rules.

Three oil and gas hearings were held. Two of these were contested case hearings to amend orders and terminate escrows. The third was an administrative rules hearing to establish a rule to designate boundaries for the Mist Gas Field.

The Northwest Association of Petroleum Landmen, founded last year, has changed its name to the Northwest Petroleum Association. Membership has grown to 165 members. Four quarterly meetings were held during 1983, three in Portland and one in Olympia.

Seismic permits were issued by the Oregon Department of Transportation for various parts of the state. Most of the applications were for permits in western Oregon in the Mist-Clatskanie area of Columbia County, in the eastern Willamette Valley east of Salem, and in the western Willamette Valley from Eugene to Forest Grove, indicating continued interest in this part of the state as a possible oil and gas province. Seismic permits issued for western Wheeler County, which is in eastern Oregon, indicate a possible extension of interest in the exploration activities occurring to the north in central Washington. □

Rogue Gem and Mineral Club display featured in Capitol Building

On March 1, 1984, members of the Rogue Gem and Mineral Club of Grants Pass installed a new exhibit in the Oregon Council of Rocks and Mineral Club display case on the first floor of the Capitol Building in Salem. Included in the display are more than fifty separate items from eight Oregon counties, Mexico, and Brazil.

Featured in the display are such items as two functioning clocks, one of pink and black rhodonite and one of green Cedar Mountain jade, soapstone sculptures, rhodonite bookends, agate book ends, jade and rhodonite bowls, a marble vase, an obsidian goblet, and a rodingite shot glass.

The variety of materials in the exhibit includes a large calcite crystal, rhodonite, Cedar Mountain jade, soapstone, rodingite, marble, obsidian, Oregon picture rock, Graveyard Point plume agate, petrified wood, carnelian, Blue Mountain jasper, serpentine/tremolite, and thundereggs.

This exhibit, which replaced that of the Willamette Agate and Mineral Society, will remain in place until June 1, 1984. □

GSOC meetings announced

The Geological Society of the Oregon Country (GSOC) holds noon meetings in the Standard Plaza Building, 1100 SW Sixth Ave., Portland, Oregon, in Room A adjacent to the third-floor cafeteria, and 8-p.m. evening lectures at Portland State University, Room 371, Cramer Hall. Upcoming meetings, topics, and speakers are:

April 20 (luncheon)—*Statues of the Easter Islands*, by Esther Schwartz.

May 4 (luncheon)—*A Message From the Stone Age*, by John Nance, author and photographer.

May 11 (lecture)—Michael Cummings, PSU Geology Department, will introduce *GSOC Scholarship Award students*.

May 18 (luncheon)—*Archaeological Specimens—Fake or Genuine?* by Harvey Steele, past president of the Archaeological Society.

May 25 (lecture, "Invite a Guest Night")—*Oregon from the Air*, by Ewart Baldwin, author of *Geology of Oregon*.

June 1 (luncheon)—*An Elder Hostel Experience*, by Wally McClung, naturalist-photographer, GSOC president in 1969.

June 8 (lecture)—*Geology of Death Valley*, by Donald D. Barr, naturalist-biologist, GSOC president in 1968.

For additional information about the lectures or luncheons, contact Viola L. Oberson, GSOC president, phone (503) 282-3685.

ABSTRACTS

The Department maintains a collection of theses and dissertations on Oregon geology. From time to time, we print abstracts of new acquisitions that we feel are of general interest to our readers.

THE GEOLOGY AND STRATIGRAPHY OF THE TERTIARY VOLCANIC AND VOLCANICLASTIC ROCKS, WITH SPECIAL EMPHASIS ON THE DESCHUTES FORMATION, FROM LAKE SIMTUSTUS TO MADRAS IN CENTRAL OREGON, by Jeremy Barth Jay (M.S., Oregon State University, 1982)

A sequence of volcanic, volcaniclastic, and epiclastic deposits from Oligocene to Recent age are exposed in the region from Lake Simtustus to Madras in central Oregon. The epiclastic sediments of the Oligocene John Day Formation are unconformably overlain by two flows of the middle Miocene Columbia River Basalt Group. The upper Miocene and lower Pliocene Deschutes Formation generally overlies the Columbia River basalt. The Deschutes Formation includes ash flows, pumice and ash falls, lava flows, and epiclastic deposits. An ash-flow tuff with a composition similar to other Deschutes ash flows occurs between flows of Columbia River basalt suggesting that the formations interfinger.

The two flows of Columbia River basalt have compositions typical of the Prineville chemical type. The flows contain an average of 1.24 weight-percent P_2O_5, and K_2O is high compared to other types of Columbia River basalt.

The Columbia River basalt and underlying rocks have been moderately deformed, producing broad anticlines and synclines and normal faults with small displacement. Northwest of Madras, the Columbia River basalt dips three or four degrees to the southeast. The Deschutes Formation and overlying rocks are generally flat lying and undeformed. No faults were found extending into the Deschutes deposits.

The Pelton Basalt Member is an 80- to 150-ft-thick unit of tholeiitic basalt that occurs near the base of the Deschutes Formation. It contains numerous discontinuous flow units which represent separate lobes of a compound lava flow. No interbeds or paleosols between flow units were found. The basalt is probably the result of a single prolonged eruption. Six intraformational lava flows occur interstratified with volcaniclastic and epiclastic deposits. Five of these flows are basalt; one flow is basaltic andesite.

The Deschutes volcaniclastic rocks generally occur in a 400-ft-thick interval above the Pelton Member and below rim-forming basalt lavas. The best exposures of these deposits are at the Vanora Cliff and at the cliff on the north side of the mouth of Willow Creek. Rocks in both of these areas are exposed as the result of large landslides. The ash-flow tuffs range in composition from dacite to rhyolite and in thickness from three to 60 ft. The deposits generally have restricted areas of exposure. The strikes of paleochannels filled by ash flows and the orientation of the long axes of clasts in underlying fluvial conglomerates indicate a west or southwest provenance for these deposits.

Seven lithic-rich laharic-breccia deposits occur interstratified with the ash flows and epiclastic deposits. The laharic breccias are the most resistant and extensive volcaniclastic rocks in the mapped area. In certain outcrops, the breccias consist of as much as 70 percent angular to subrounded lithic clasts suspended in a fine-grained matrix of glass shards. The deposits are more numerous, thicker, and more poorly sorted to the north and northwest, indicating a provenance to the northwest. Many features of the deposits are similar to volcanic lahars but other characteristics indicate that the materials were subjected to temperatures above the Curie point of the clasts. Some of these units might have been produced by a combination of fluvial materials and a hot pyroclastic flow.

A widespread sheet of tholeiitic basalt caps the Deschutes Formation. Similarity between eight chemical analyses, constant phenocryst mineralogy, and uniform normal paleomagnetic polarity of samples from Binder's Canyon to Round Butte Dam suggest that the rim-forming flow is a single sheet of lava that originally covered the mapped area.

Round Butte cinder cone and lava flow are the youngest Deschutes Formation deposits in the mapped area. The Round Butte deposits have a composition similar to other intraformational lavas and therefore represent a continuation of the volcanism that has occurred throughout the late Miocene and early Pliocene in the Deschutes Basin.

STRUCTURE AND INFLUENCE OF THE TILLAMOOK UPLIFT AND THE STRATIGRAPHY OF THE MIST AREA, OREGON, by Moinoddin Murtuzamiya Kadri (M.S., Portland State University, 1982)

Around the hamlet of Mist in Columbia County, northwestern Oregon, four formations ranging in age from late Eocene to middle Miocene are exposed. The late Eocene Keasey Formation consists of gray, tuffaceous, concretionary mudstone, siltstone, and minor sandstone. The unstable and complex environment of deposition is indicated by lutokinesis and wide, shallow submarine channels.

Deltaic deposits of the Pittsburg Bluff Formation unconformably overlie the Keasey Formation. The lower laminated member (informal) of the Pittsburg Bluff Formation consists of finely laminated mudstone and interlayered arkosic sandstone. The upper siltstone member (informal) consists of bioturbated, carbonaceous siltstone and sandstone. It crops out in an arcuate belt generally paralleling the Nehalem River and thins rapidly towards the west.

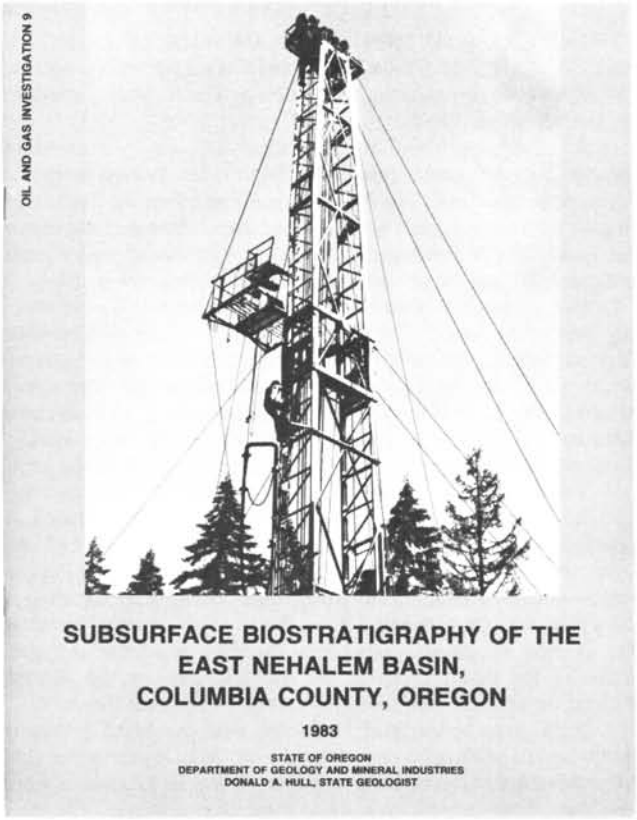
The middle Miocene Astoria Formation unconformably overlies the Pittsburg Bluff and Keasey Formations and consists of poorly consolidated, lithic arkosic to quartzose sandstone and siltstone. Primary structure is well developed in the Astoria Formation; micro cross-bedding and trough cross-bedding are common in the sandstone. The Columbia River Basalt Group is represented by the Grande Ronde and Frenchman Springs geochemical types. Some of the basalt clasts in the conglomerates in the Astoria Formation were derived from Columbia River basalt flows.

Fifty-three sedimentary samples were analyzed for their minor and trace element concentrations utilizing instrumental neutron activation analysis. Concentrations of Na, K, La, Sm, and Sc, and their ratios appear to establish significant trends. The data suggest a major break from a granitic-metamorphic provenance and a volcanic-component-dominated provenance between the Cowlitz and Keasey Formations respectively. The provenance of the Astoria Formation indicates the presence of flood basalts.

Complex faulting along northeast-southwest and younger northwest-southeast trends primarily involves vertical movements. Exposed faults have steep dips, narrow shear zones, very little drag and form horsts and grabens. Pi-S_0 diagrams of the Keasey, Pittsburg Bluff, and Scappoose Formations indicate near-horizontal to northerly or northeasterly dips. Northeast-trending, horizontal Beta axes in the Pittsburg Bluff (siltstone member) and Scappoose Formations parallel the axis of the Tillamook arch. The northwest-trending Beta axis of the Scappoose Formation probably reflects the latest structural grain of the area. Near-horizontal dips of the strata, especially those of the post-Cowlitz age, the high-angle faults, and the horizontal Beta axes probably preclude uplift involving extensive compression and thrusting. The post-Keasey uplift produced an unconformity and restricted the deposition of coarser lithofacies of the Pittsburg Bluff Formation to the east and around the nose of the plunging axis of the Tillamook arch. Post-Keasey but pre-Astoria uplift along the axis of the Tillamook arch and Willapa Hills upwarp produced the east-west trending Columbia River synclinal trough. The Astoria Formation and the Columbia River basalt flows are depositionally confined to this structural downwarp. Continuity in the outcrop pattern of the middle Tertiary units perhaps precludes any large-scale strike-slip offset. □

New biostratigraphic study analyzes subsurface of Mist Gas Field area

Fifteen wells drilled in the area of Columbia County's Mist Gas Field, Oregon's only producing natural gas field, are the subject of a biostratigraphic study published by the Oregon Department of Geology and Mineral Industries (DOGAMI).



Oil and Gas Investigation 9.

The newly published report, entitled *Subsurface Biostratigraphy of the East Nehalem Basin, Columbia County, Oregon*, was prepared by paleontologist Daniel R. McKeel and has been released as DOGAMI's Oil and Gas Investigation 9. It includes individual fossil reports based on 1,478 samples taken from 15 wells, with sample-by-sample descriptions of rock types and marine fossils. These identifications are used to determine the age, water depth, and paleoenvironment for each distinctive well interval. Included with this 34-page report is a separate subsurface illustration that contains a surface location map and key correlations for all the wells in the form of three separate north-south cross sections.

Using technical data and actual well cutting samples, this study precisely interrelates the ages and kinds of rocks in the wells of the Mist Gas Field area. The result is a better understanding of detailed geology of the area, which, in turn, will aid future exploration, promote positive regulation of the resource, and provide a useful basis for resource conservation and environmental protection, according to Deputy State Geologist John D. Beaulieu.

Oil and Gas Investigation 9 is now available at the Oregon Department of Geology and Mineral Industries, 1005 State Office Building, Portland, OR 97201. The purchase price is $6. Orders under $50 require prepayment. □

Fireball sighted

A fireball sighting on February 16, 1984, at 6:07 p.m. PST, was reported by two separate observing parties, Philip Brodahl of Portland and Gary Messer and John Borden of Albany.

Bordahl made his observation at lat. 45°26′N., long. 122°39′W. and was facing east. He first saw the fireball 6° south of east at an altitude of 45° and saw it last due east at an altitude of 20°. The angle of descent of the fireball was approximately 60°, and the duration of its flight was two seconds. The fireball was three times the size of Venus and white. It had a white, 25°-long tail. There was no sound or breakup. At the time of the observation, the sun was below the horizon, but it was not totally dark yet.

Messer and Borden sighted the same fireball at lat. 44°40′N., long. 123°9′W. and were facing north. The fireball was first seen in the east at an altitude of 70° and was last seen 3° north of east at an altitude of 20°, when it disappeared behind a band of clouds. The fireball's angle of descent was 30°, and the duration of its flight was three seconds. Its size was one-tenth of the full moon, and its color was light blue-green. No tail, sound, or breakup was observed. Messer and Borden also reported that the sun had set but that it was not totally dark yet. □

AIME announces 1984 spring field trip

The Oregon section of the American Institute of Mining and Metallurgical Engineers (AIME) announces that the annual spring field trip will be on the geology and hydrothermal alteration of Glass Buttes in south-central Oregon. Glass Buttes is a Pliocene silicic volcanic center in the High Lava Plains province of Oregon. The buttes are underlain by rhyolitic glass domes, flows, and sparse pyroclastic deposits that are interlayered with, and overlain by, basalt. Mercury was mined from hydrothermally altered rocks in the eastern end of the complex during the 1950's. The hydrothermal alteration is dominated by opal replacement of glass, with minor alunite, opal, and hyalite veins. Precious-metal mineralization occurs locally at the surface and in the subsurface.

The field trip is scheduled for June 9 and 10, 1984. On June 9, the trip will focus on the hydrothermal alteration zones, and on June 10, the emphasis will be on the volcanic stratigraphy of the Glass Buttes complex. Trip leaders will be Michael L. Cummings and Michael J. Johnson of Portland State University. Further information may be obtained from the Department of Geology, Portland State University, P.O. Box 751, Portland, Oregon 97207, phone (503) 229-3022. □

Historic candlestick discovered at Oregon Historical Society

Norman Wagner's excellent article on miner's candlesticks (*Oregon Geology*, v. 44, no. 12) captured my interest and has led to an important discovery concerning Oregon's heritage of inventors. As Curator of Technology, one of my responsibilities is to care for our regional collection of mining artifacts, so naturally after reading the article I dashed to our storage room and double-checked our dozen or so candlesticks for errors in our catalog descriptions. After several letters to and from Mr. Wagner, and instructions on how to scrutinize a candlestick for patent dates, we discovered that one of the Society's candlesticks, 73-89.13, with previously unnoted date or manufacturer, was faintly stamped "JAN 9 1883." Further checking, especially in Ramsdell's and Wagner's book on miner's candlesticks, indicates the candlestick was made and patented by John Jones of Oregon City, patent no. 270,316. This is an important discovery because as of this writing it is the only known surviving example of the earliest Oregon patent for a miner's candlestick. Also, it is only the third example extant of five miner's candlesticks patented by Oregonians between 1883 and 1908.

—Ron Brentano, Oregon Historical Society

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