3979
NAME- SCHOOL CREEK REFERENCE NUMBER- 0410370043
STATE- OREGON COUNTY- LAKE ELEV:PREC- 2030M: 10M
LATITUDE- N 42 38 14 PRECISION- 500M
LONGITUDE- W 120 49 08 REFERENCE POINT- ORE BODY
UTM: ZONE 10N NORTHING 4729621 EASTING 678829
PUBLIC LAND SURVEY TOWNSHIP- 035 S RANGE- 016 E
DESCRIPTION SECTION- 19 SECTION SUBDIVISION- NW
RIVER BASIN- 73C SPRAGUE RIVER DOMAIN- NAT FOREST
STATUS- RAW PROSPECT OPERATION TYPE- PROSPECT
MESA ID NO. 35 02586 YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- FISHHOLE MTN OREG TYPE- 15 MIN
1:250,000 MAP NAME- KLAMATH FALLS MINERAL PROPERTY FILE-
PRIMARY NAME- SCHOOL CREEK
COMMOD/MOD- MERCURY

3980
NAME- SNAGG SPRING PIT REFERENCE NUMBER- 0410370090
STATE- OREGON COUNTY- LAKE ELEV:PREC- 1463M:500M
LATITUDE- N 42 11 10 PRECISION- 500M
LONGITUDE- W 120 20 36 REFERENCE POINT- TRENCH
UTM: ZONE 10N NORTHING 4673643 EASTING 719390
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 020 E
DESCRIPTION SECTION- 15 SECTION SUBDIVISION-
RIVER BASIN- DOMAIN- UNKNOWN
STATUS- UNKNOWN OPERATION TYPE- SURFACE
MESA ID NO. 35 00679 YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- LAKEVIEW NE TYPE- 7.5 MIN
1:250,000 MAP NAME- MINERAL PROPERTY FILE-
PRIMARY NAME- SNAGG SPRING PIT
COMMOD/MOD- STONE MISCELLANEOUS DM
MESA

3981
NAME- STRAWBERRY PIT REFERENCE NUMBER- 0410370026
STATE- OREGON COUNTY- LAKE ELEV:PREC- 1722M: 10M
LATITUDE- N 42 08 30 PRECISION- 1KM
LONGITUDE- W 120 50 33 REFERENCE POINT- ORE BODY
UTM: ZONE 10N NORTHING 4667544 EASTING 678291
PUBLIC LAND SURVEY TOWNSHIP- 039 S RANGE- 016 E
DESCRIPTION SECTION- 32 SECTION SUBDIVISION- NENESE
RIVER BASIN- 72A DOMAIN- NAT FOREST
STATUS- PRODUCER OPERATION TYPE- SURFACE
MESA ID NO. 35 01063 YEAR FIELD CHECKED- MAP REPOSITORY- FOC
MAP NAME- STRAWBERRY BUTTE TYPE- 15 MIN
1:250,000 MAP NAME- KLAMATH FALLS MINERAL PROPERTY FILE-
PRIMARY NAME- STRAWBERRY PIT
COMMOD/MOD- STONE MISCELLANEOUS CB
MSHA NOV. 1979

INERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... MC20020
RECORD TYPE..... X1M
INFORMATION SOURCE... 1
MAP CODE NO. OF REC..

REPORTER
NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
AFFILIATION..... ODGMI
DATE..... 81 01

AND LOCATION
OSIT NAME..... SCHOOL CREEK PROSPECT

NTRY CODE..... US
NTRY NAME: UNITED STATES

TE CODE..... OR
TE NAME: OREGON

NTY..... LAKE
INAGE AREA..... 18010202 CALIFORNIA
SIOGRAPHIC PROV..... 12 BASIN AND RANGE
E CLASSIFICATION..... 41

D SCALE | QUAD NO OR NAME
24000 | HARVEY CK (1960)

TITUDE | LONGITUDE
-38-13N | 120-49-00W

NORTHING | UTM EASTING | UTM ZONE NO
22600 | 578940 | 10

..... 0345
GE..... 015E
TION.. 10
DETAN. WILLAMETTE

CITY INFORMATION
MODITIES PRESENT..... HG AU

CCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.....
OCCURRENCE..... HG AU

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
LODE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL

PRODUCTION
NO PRODUCTION

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... MID-PLIO
HOST ROCK TYPES..... RHYOLITE

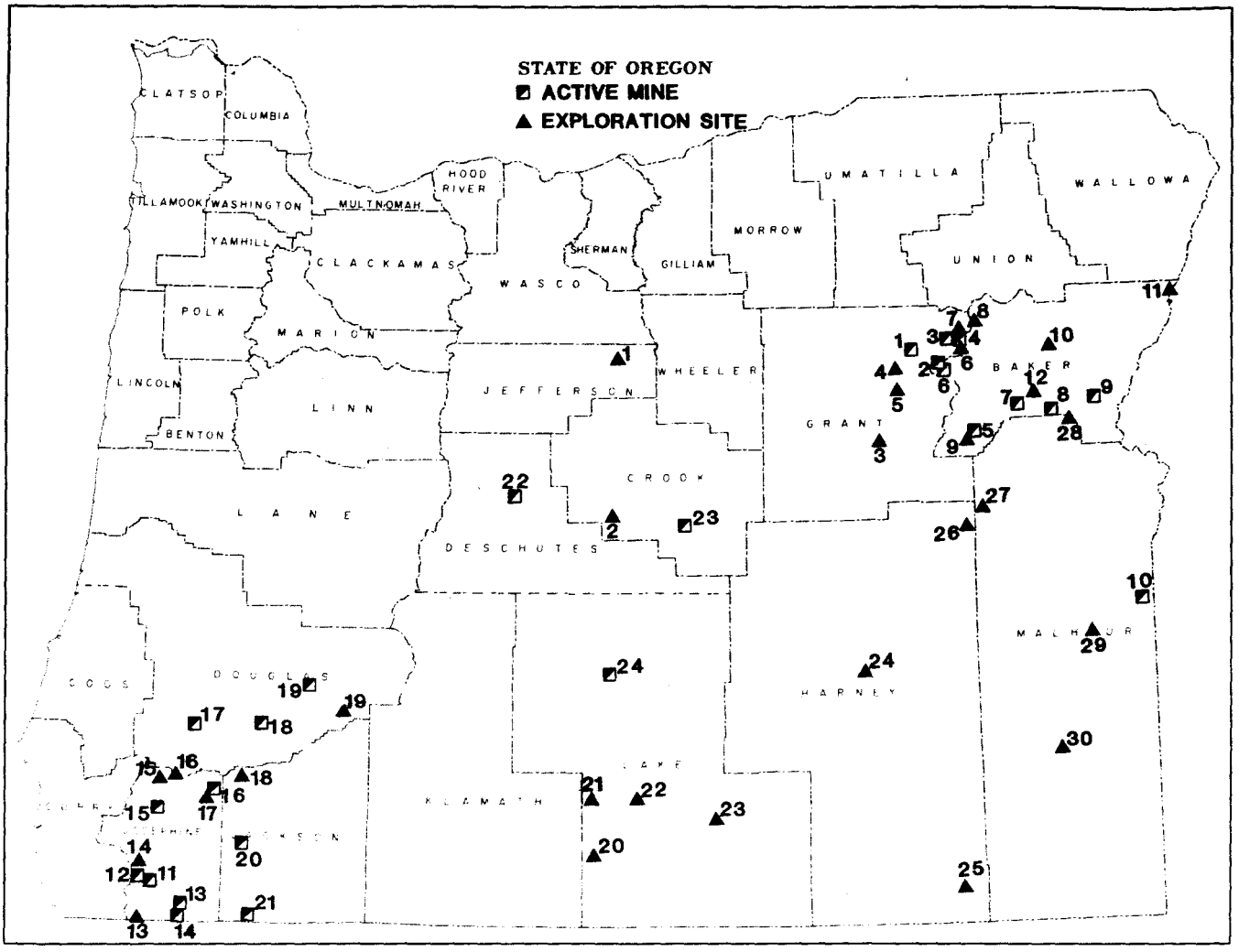
AGE OF ASSOC. IGNEOUS ROCKS.. MID-PLIO
IGNEOUS ROCK TYPES..... RHYOLITE

PERTINENT MINERALOGY..... OPAL

LOCAL GEOLOGY

COMMENTS (GEOLOGY AND MINERALOGY):
CINNABAR OCCURS AS FRACTURE COATINGS IN OPALIZED, BLEACHED RHYOLITE

GENERAL REFERENCES
1) PETERSON, N.V. AND MCINTYRE, J.R., 1970, THE RECONNAISSANCE GEOLOGY AND MINERAL RESOURCES OF EASTERN KLAMATH AND WESTERN LAKE COUNTIES, OREGON; OOGMI BULL. 66, P. 50



EXPLANATION

ACTIVE MINES (half-filled square)

1. Tempest (Ag)
2. Pyx (Au)
3. Boulder Creek (Au)
4. Elk Heaven (Au, Ag)
5. Thomason (Au)
6. Burnt River (Au)
7. Pine Creek (Au)
8. Clarks Creek (Au)
9. Ash Grove Cement West (cement, limestone)
10. Teague Mineral Products (bentonite, zeolite)
11. Fall Creek Gold (Au)
12. Josephine Creek and tributaries (Au)
13. Sucker Creek (Au)
14. Althouse Creek (Au)
15. Galice area placers (Au)
16. Greenback (Au)
17. Nickel Mountain (Ni)
18. Coffee Creek (Au)
19. Quartz Mountain Silica (silica)
20. Bristol Silica (silica)
21. Steatite of Southern Oregon (soapstone)
22. Cascade Pumice, Central Oregon Pumice (pumice)
23. Camp Creek (clay)
24. Oil-Dri West (diatomite)

EXPLORATION SITES AND AREAS (solid triangle)

1. Rejax (Au, Ag)
2. Bear Creek Buttes (Au)
3. Miller Mountain (Au)
4. Susanville (Au, Ag)
5. Dixie Meadows (Au, Ag)
6. Bald Mountain-Ibex (Au, Ag)
7. Cable Cove (Au, Ag)
8. Meadow Lake (Au, Ag)
9. Grouse Spring (Cu, Mo)
10. Flagstaff (Au)
11. Iron Dyke (Au, Ag, Cu)
12. Dooley Mountain (perlite)
13. Turner-Albright (Au, Ag, Zn, Cu, Co)
14. Fall Creek Copper (Au, Ag, Cu, Co)
15. Gold Bug (Au)
16. Goff (Au, Ag, Cu, Pb, Zn)
17. John Hall (Au)
18. Gold Note (Au, Ag, Cu)
19. Foster Creek (clay)
20. Quartz Mountain (Au)
21. Little Baldy (Au)
22. Tucker Hill (perlite)
23. Coyote Hills (Au)
24. Harney prospect (zeolite)
25. Flagstaff Butte (Au)
26. Celatom (diatomite)
27. Castle Rock (Au)
28. Sunday Hill (Au)
29. Red Butte (Au)
30. Rome prospect (zeolite)

Mining and mineral exploration in Oregon in 1985 (excluding sand and gravel and stone). Active mines are keyed to Table 1; exploration sites are keyed to Table 2.

ties near Durkee in southern Baker County. The plant at Durkee was built in 1980 and has an annual production capacity of 500,000 tons of cement. Additional amounts of crushed limestone from the quarry are supplied to sugar manufacturing plants in Idaho.

The new management at Bristol Silica and Limestone Company (20) continued to produce metallurgical-grade silica rock for Dow Corning at its mine in Jackson County. Other products included poultry grit and fine-grained silica used for filtration. Silica production was down from the previous year, and no limestone or dolomite was shipped from the property in 1985.

Hanna Mining Company continued to utilize silica rock from the Quartz Mountain Silica Mine (19) in eastern Douglas County in its nickel smelter. Production was lower than in 1984 due to the smelter shutdown during construction of the new wet-screening plant.

Steatite of Southern Oregon (21) produced block soapstone suitable for carving from its mine on Elliot Creek Ridge in southern Jackson County. Shipments of block soapstone reportedly declined slightly in 1985.

The Oregon Sun Ranch and Central Oregon Bentonite clay pits on Camp Creek (23) in central Oregon were active producers in 1985. Both properties produce low-grade clays that are used primarily in the cat-litter industry.

Teague Minerals Products (10) continued to produce bentonitic clay and zeolite from its pits near Adrian in eastern Malheur County.

Table 1. *Active mines in Oregon, 1985*

Map no.	Name	Location	Commodity	Comments
1.	Tempest	Sec. 10 T. 9 S., R. 34 E. Grant County	Ag	Newly erected small mill produced small amount of concentrates.
2.	Pyx	Sec. 1 T. 10 S., R. 35 E. Grant County	Au	Continued small, seasonal production.
3.	Boulder Creek	Sec. 34 T. 8 S., R. 35½ E. Grant County	Au	Small placer operation.
4.	Elk Haven	Sec. 16 T. 8 S., R. 36 E. Grant County	Au, Ag	Produced small amount of concentrates.
5.	Thomason	Sec. 6 T. 14 S., R. 37 E. Baker County	Au	Continued small, seasonal operation.
6.	Burnt River	T. 10 S., Rs. 35, 35½ E. Baker County	Au	Several small placer operators.
7.	Pine Creek	T. 12 S., R. 39 E. Baker County	Au	Several small placer operators.
8.	Clarks Creek	Tps. 12, 13 S., R. 41 E. Baker County	Au	Several small placer operators.
9.	Ash Grove Cement West	Sec. 11 T. 12 S., R. 43 E. Baker County	Cement, limestone	Continued production.
10.	Teague Mineral Products	Sec. 29 T. 23 S., R. 46 E. Malheur County	Bentonite, zeolite	Continued production.
11	Fall Creek Gold	T. 38 S., R. 9 W. Josephine County	Au	Small production from placer and lode by owner Tim Von Pinnon.
12.	Josephine Creek & tributaries	Secs. 30, 36 T. 38 S., Rs. 8, 9 W. Secs, 2, 11 T. 39 S., R. 8 W. Josephine County	Au	Several small placer operators.

Table 1. *Active mines in Oregon, 1985 — continued*

Map no.	Name	Location	Commodity	Comments
13.	Sucker Creek	Sec. 1 T. 40 S., R. 7 W. Josephine County	Au	Several small placer operators.
14.	Althouse Creek	Secs. 11, 12 T. 41 S., R. 7 W. Josephine County	Au	Several small placer operators.
15.	Galice area (Galice Creek, Taylor Creek, Rocky Gulch)	Secs. 25, 36 T. 34 S., R. 8 W. Secs. 2, 10, 16 T. 35 S., R. 8 W. Josephine County	Au	Several small placer operators.
16.	Greenback	Secs. 32, 33 T. 33 S., R. 5 W. Sec. 5 T. 34 S., R. 5 W. Josephine County	Au	Property returned to owners, Sunny Valley Mining & Development Co., who are currently mining on the Irish Girl vein.
17.	Nickel Mountain	Sec. 17 T. 30 S., R. 6 W. Douglas County	Ni	Mine and smelter reopened in November after installing new wet-screening plant.
18.	Coffe Creek	Sec. 7 T. 30 S., R. 2 W. Douglas County	Au	Small placer operation.
19.	Quartz Mountain Silica	Sec. 2 T. 28 S., R. 1 E. Douglas County	Silica	Reduced production due to smelter shutdown.
20.	Bristol Silica	Sec. 30 T. 36 S., R. 3 W. Jackson County	Silica	Silica production reduced from 1984 level.
21.	Steatite of Southern Oregon	Secs. 10, 11 T. 36 S., R. 3 W. Jackson County	Soapstone	Production of carving-grade soapstone declined from 1984 level.
22.	Cascade Pumice, Central Oregon Pumice	Bend area Deschutes County	Pumice	Continued production.
23.	Camp Creek	T. 19 S., R. 21 E. Crook County	Clay	Oregon Sun Ranch, Inc., and Central Oregon Bentonite Co. producing clays.
24.	Oil-Dri West	T. 27 S., R. 17 E. Lake County	Diatomite	Continued production of diatomite used mainly in pet litter.

OREGON'S MINERAL PRODUCTION

MILLIONS OF DOLLARS

	ROCK MATERIALS (Sand & Gravel, Stone)	METALS & INDUSTRIAL MINERALS (Cement, Nickel, Pumice, etc.)	NATURAL GAS	TOTAL
1972	54	22	0	76
1973	55	26	0	81
1974	75	29	0	104
1975	73	33	0	106
1976	77	35	0	112
1977	74	35	0	109
1978	84	44	0	128
1979	111	54	+	165
1980	95	65	12	172
1981	85	65	13	163
1982	73	37	10	120
1983	82	41	10	133
1984	75	46	8	129
1985	78	39	10	127

Summary of mineral production in Oregon for the last 16 years. Data for 1985 derived from U.S. Bureau of Mines annual preliminary Mineral Industry Survey and Oregon Department of Geology and Mineral Industries natural gas production statistics.

EXPLORATION AND DEVELOPMENT ACTIVITY

The level of mineral exploration and development activity in 1985 generally declined from 1984 levels. Industry interests continued an ongoing shift in emphasis from metallic to nonmetallic commodities.

Metals

State and Federal research teams continued their search for submarine polymetallic sulfide deposits along the Juan de Fuca and Gorda Ridges off the Oregon coast. The Oregon Department of Geology and Mineral Industries released a comprehensive map (GMS-37) showing known offshore mineral resources.

Similar onshore polymetallic sulfide deposits continued to be evaluated in southwest Oregon. The Turner Albright Mine (13)** in extreme southwest Josephine County is one of the best known sulfide deposits in Oregon. The property is now owned by Baretta and is currently being evaluated by Ray Rock Mines, Inc. Ray Rock did a pulse-electromagnetic geophysical survey to determine the downdip extension of the ore zone.

Previous drilling programs by Baretta and Noranda reportedly outlined 3.3 million tons of reserves averaging 0.114 oz per ton of gold, 0.443 oz per ton of silver, 1.46 percent copper, 3.32 percent zinc, and 0.055 percent cobalt.

Ore-dressing research on the complex sulfide ore is being conducted by the U.S. Bureau of Mines (USBM) research center in Salt Lake City, Utah.

The U.S. Geological Survey (USGS) is also conducting a study of the deposit as an onshore example of a submarine black-smoker deposit.

Seneca Exploration of Vancouver, B.C., and Litho-Logic Resources of Grants Pass, Oregon, are conducting a geologic mapping and sampling program on the Fall Creek Copper (14) massive sulfide deposit in Josephine County. The deposit is situated about 10 mi west of Selma along Fall Creek, a tributary of the Illinois River. The massive sulfide deposit is associated with pillow basalts and ultramafic rocks and may be another example of a black-smoker deposit.

Other massive sulfide deposits currently being evaluated in Oregon are hosted by island-arc volcanic rocks. Amselco is conducting a drilling project on one of these deposits, the Goff Mine (16), located in Josephine County about 2 mi north of Grave Creek between Rock Creek and Reuben Creek. The deposit is in siliceous tuffs and contains massive sulfides capped by barite. Amselco is drilling on lands leased for exploration from Josephine County.

Boise Cascade drilled the Gold Note (18) stratabound sulfide deposit on the Josephine-Jackson County line in the upper Grave Creek area.

Activity on similar deposits in northeastern Oregon has been steadily decreasing in recent years. The Iron Dyke Mine (11) on the Snake River in eastern Baker County was inactive through most of 1985. The owner and operator, Silver King Mines, Inc., placed a crew on the property in late fall of 1985 with the expressed intent of mining out a 20,000-ton ore body left from earlier operations. The ore body is reported to run about 0.3 oz per ton of gold and 3 percent copper.

Most of the recent activity in northeast Oregon has focused on vein gold deposits about the margins of the Late Jurassic-Early Cretaceous intrusions. During spring, Rio Algom put down some drill holes on the Sunday Hill Mine (28) located in the old Mormon Basin district in southern Baker County. The property is held by Capri Resources Ltd. of Vancouver, B.C.

Sunshine Mining and Minerals was active in the Virtue Flat district east of Baker. The company sampled some of the accessible underground workings on the old Flagstaff Mine (10). This property explored quartz veins and sheared gouge zones in a metamorphosed intrusive complex of gabbro and quartz diorite.

Inspiration drilled 12 holes at the Dixie Meadows Mine (5) north of Prairie City. Drill results were discouraging, and Inspiration dropped its option on the property which is held by Big Turtle Mines, Inc., of Boise, Idaho.

American Copper and Nickel Company, Inc., a subsidiary of INCO Ltd., continued exploration at its Susanville property (4) in northern Grant County. The property is located adjacent to the southwest margin of the Sunrise Butte stock and contains several sulfide-rich precious metal veins that are hosted in schist and serpentine. In 1985, American Copper and Nickel continued evaluation of one of those, the Bull of the Woods vein, in a 6,000-ft surface-drilling program.

American Copper and Nickel was also active in and along the margins of the Bald Mountain Batholith. This area has historically been one of the most productive lode gold regions in Oregon. American Copper and Nickel continued its evaluation of the Bald Mountain Mine (6) under the terms of a joint venture agreement with the owners of the property, Ibex Mining Company. The 1985 program consisted of a 9,500-ft surface drilling program on the Bald Mountain-Ibex and Grand Trunk vein systems. The drill program was completed in late November. Other lode properties along the southern margins of the batholith, including the North Pole-Columbia, Cougar-Independence, Buffalo, and Argonaut Mines, were idle in 1985.

**All site numbers in this section refer to "Exploration Sites and Areas" on the location map and in Table 2.

Table 2. *Exploration sites and areas in Oregon, 1985*

Map no.	Name	Location	Commodity	Comments
1.	Rejax	SE part of T. 9 S., R. 17 E. Jefferson County	Au, Ag	Continued exploration by Ocelot Industries Ltd.
2.	Bear Creek Buttes	T. 18 S., R. 17 E. Crook County	Au	Exploration program by Shell Mining Company.
3.	Miller Mountain	Sec. 22 T. 14 S., R. 32 E. Grant County	Au	Sampling of underground workings by CBM.
4.	Susanville	T. 10 S., R. 33 E. Grant County	Au, Ag	Continued diamond drill program by American Copper and Nickel.
5.	Dixie MeadowsSec. 23 T. 11 S., R. 33 E. Grant County	Au, Ag	Drill program by Inspiration.	
6.	Bald Mountain-Ibex	Sec. 4 T. 9 S., R. 36 E. Baker, Grant Counties	Au, Ag	Continued diamond drill program by American Copper and Nickel.

Table 2. *Exploration sites and areas in Oregon, 1985 —continued*

Map no.	Name	Location	Commodity	Comments
7.	Cable Cove	T. 8 S., R. 36 E. Baker County	Au, Ag	Small drill program by American Copper and Nickel.
8.	Meadow Lake	T. 8 S., R. 37 E. Baker, Grant Counties	Au, Ag	Shell Mining Company joined in joint venture program with Manville Corp.
9.	Grouse Spring	Secs. 24, 25 T. 14 S., R. 36 E. Baker County	Cu, Mo	Small drill program by Manville Corp.
10.	Flagstaff	Sec. 5 T. 9 S., R. 41 E. Baker County	Au	Underground workings sampled by Sunshine.
11.	Iron Dyke	Sec. 21 T. 13 S., R. 45 E. Baker County	Au, Ag, Cu	Reopened by Silver King.
12.	Dooley Mountain	Tps. 11, 12 S., R. 40 E. Baker County	Perlite	Evaluation program by Supreme Perlite.
13.	Turner-Albright	Secs. 3, 15, 16 T. 41 S., R. 9 W. Josephine County	Au, Ag, Zn, Cu, Co	Continued evaluation by Ray Rock.
14.	Fall Creek Copper	Tps. 37, 38 S., R. 9 W. Josephine County	Au, Ag, Cu, Co	Mapping and sampling program by Seneca Exploration and Litho-Logic Resources.
15.	Gold Bug	Sec. 26 T. 33 S., R. 8 W. Josephine County	Au	Old workings reopened by GeoMining Company of Salt Lake City.
16.	Goff	Secs. 20, 29 T. 33 S., R. 7 W. Josephine County	Au, Ag, Cu, Pb, Zn	Drill program by Amselco.
17.	John Hall	Sec. 18 T. 34 S., R. 5 W. Josephine County	Au	David Gaunt and Gene Lattimer of Sunny Valley reopened old workings and set up small mill.
18.	Gold Note	Sec. 30 T. 33 S., R. 3 W. Jackson, Josephine Counties	Au, Ag, Cu	Drill program by Boise Cascade.
19.	Foster Creek	T. 29 S., R. 3 E. Douglas County	Clay	Evaluation of soil amendment material by Cascade Sulfur Company.
20.	Quartz Mountain	T. 37 S., R. 11 E. Lake County	Au	Continued evaluation of large-tonnage epithermal gold deposit.
21.	Little Baldy	T. 34 S., R. 16 E. Lake County	Au	Exploration program by Long Lac.
22.	Tucker Hill	Sec. 35 T. 34 S., R. 19 E. Lake County	Perlite	Continued evaluation by Tenneco.
23.	Coyote Hills	T. 35 S., R. 23 E. Lake County	Au	Drilled and later dropped by Cominco American.
24.	Harney prospect	T. 27 S., R. 31 E. Harney County	Zeolite	Continued drilling by Anaconda.
25.	Flagstaff Butte	T. 39 S., R. 37 E. Harney County	Au	Exploration program by Utah International.
26.	Celatom	Tps. 19, 25 S., Rs. 35, 36, 37 E. Harney, Malheur Counties	Diatomite	Plant construction by Eagle Picher.
27.	Castle Rock	T. 18 S., R. 37 E. Malheur County	Au	Exploration program by Manville Corp.
28.	Sunday Hill	Sec. 17 T. 13 S., R. 42 E. Malheur County	Au	Drilled by Rio Algom.
29.	Red Butte	Secs. 26, 27, 34, 35 T. 25 S., R. 43 E. Malheur County	Au	Tenneco joint-ventured with Manville Corp. on a sampling and mapping program.
30.	Rome prospect	Tps. 31, 32 S., R. 41 E.	Zeolite	Continued drilling by Anaconda.

STATE OF OREGON
Department of Geology and Mineral Industries
1069 State Office Building
Portland, Oregon 97201

The Reconnaissance Geology and Mineral Resources of Eastern Klamath County and Western Lake County, Oregon

By
Norman V. Peterson
and
James R. McIntyre

BULLETIN 66

1970

QUICKSILVER

Even though the production has been small, mercury follows uranium in importance as a metallic mineral in the project area. Brooks (1963), in a study of quicksilver in Oregon, shows the recorded production from the project area to be 34 flasks all from one property, the Angel Peak mine near Quartz Mountain. An additional unrecorded $2\frac{1}{2}$ flasks has been credited to the Currier prospect at the south end of Summer Lake.

The map of mineral deposits (plate 2) shows the scattered nature of the quicksilver occurrences. Mercury occurs in all of them as the mineral cinnabar, associated with intermediate-to-acid intrusive-extrusive rocks (QTvrd). Wherever it occurs, silicification and/or opalization is also abundant. Near Quartz Mountain there is a small concentration of prospects. The quicksilver mineralization occurs with opalized rhyolite, rhyolite tuffs, and silicified rhyolite breccia in a narrow, irregular northwest-trending zone several miles long. Potassium-argon dating of the surrounding glassy rhyolite shows that the mineralization here must be less than about 8 million years old.

The following descriptions of individual quicksilver mines and prospects and the information in table 6 is mainly from Brooks' (1963) study. Map numbers indicate locations on plate 2.

Angel Peak Mine

The Angel Peak mine was developed and operated from time to time between 1956 and 1959. Total production has been 34 flasks of quicksilver. A 30-inch rotary furnace formerly located at the property has been removed and the mine is now idle. The deposit is at the top of a hill locally known as Angel Peak (see figure 26).

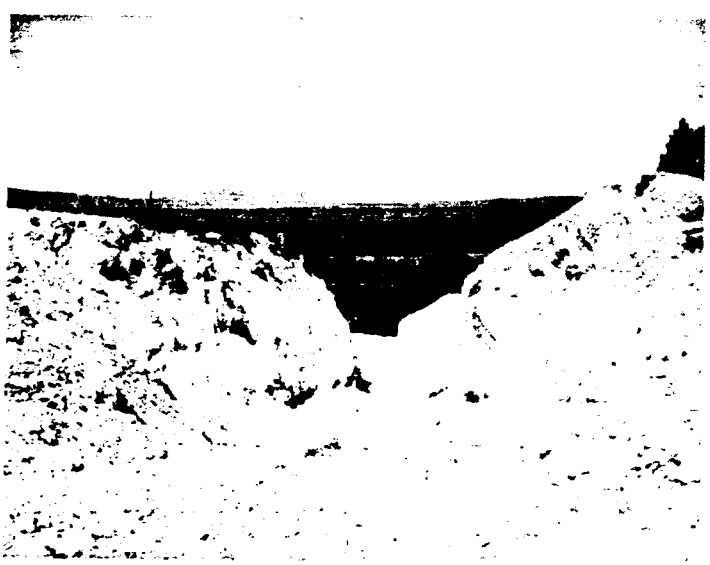


Figure 26.

Large north-trending open cut at the Angel Peak quicksilver mine. Vertically flow-banded rhyolite vitrophyre has been altered to opal and clay.

Brooks (1963, p. 175) described the occurrence as follows:

> On the crest of Angel Peak an area about 100 yards in diameter has been stripped of overburden. Much of the rock exposed has been opalized, though some parts of it have been altered to a soft powdery mixture of silica and alunite. Identifiable rocks in the opalized area and along its edges include rhyolite, tuffs, tuff breccias, and glassy andesite. Along the west edge of the opalized area the glassy rocks are interlayered with the opalized material.

Table 6. Quicksilver occurrences in Lake and Klamath Counties.

Map No.	Name	Location	Geologic occurrence	Remarks	Reference
1	Oregon Technical Institute	N. edge sec. 20, T. 38 S., R. 9 E.	Minor disseminated cinnabar in layered opal and agate of hot-spring origin. Pleistocene (?) age.		
2	Klamath Hills	S. edge sec. 35, T. 40 S., R. 9 E.	Minor disseminated cinnabar in siliceous sinter of Pleistocene (?) age.		Department assay rept.
3	Givan ranch prospect	NE¼ sec. 25, T. 36 S., R. 12 E.	Cinnabar assays as high as 16 lbs./ton reported from zones of opalization in layered rhyolite breccias.	No production.	Brooks, 1963
4	School Creek	NE¼ sec. 10, T. 34 S., R. 16 E.	Cinnabar on fractures, in opalized, bleached rhyolite. Grab sample assayed 3.7 lbs./ton.	Discovered in 1968 (?).	No report.
5	Currier mine	Sec. 36, T. 32 S., R. 16 E.	Cinnabar occurs as fracture filling and splotchy aggregates in a sheared brecciated zone 50 ft. wide in andesite.	Production of 2½ flasks.	Brooks, 1963; Ross, 1941.
6	O'Leary prospect	Sec. 5, T. 35 S., R. 18 E.	Cinnabar occurs in thin veinlets and coatings on fractures of andesite breccia and massive rhyolite.	No production.	Brooks, 1963
7	Chewaucan River	Secs. 9, 16; T. 34 S., R. 18 E.	Not known.	On banks of Chewaucan River, short adit. No production.	Brooks, 1963
8	Crone prospect	NE¼ sec. 34, T. 37 S., R. 16 E.	Cinnabar occurs sparingly in isolated boulders of silicified rhyolite breccia.	No record of production.	Brooks, 1963; Johns, 1949.
9	Manzanita group	SW¼ sec. 26, NW¼ sec. 35, T. 37 S., R. 16 E.	(See Text)	9 claims. No production.	
10	Angel Peak mine	NW¼ sec. 32, T. 37 S., R. 17 E.	(See Text)	Recorded production of 34 flasks.	Brooks, 1963
11	Rosalite prospect	SE¼ sec. 5, T. 38 S., R. 17 E.	Mineralization similar to the Angel Peak – intense opalization and bleaching of rhyolite.	No production.	Brooks, 1963
12	Digmore or Salt Creek	NE¼ sec. 12, T. 38 S., R. 20 E.	Cinnabar disseminated in clayey altered tuffs and fracture coatings in opalite breccia.	Several bulldozer cuts and prospect pits. No production.	Department open-file report.
13	Pinto group	Sec. 6, T. 41 S., R. 18 E.	Cinnabar occurs disseminated and as fracture fillings in chalcedony and opal in altered pumice tuffs.	No production.	Brooks, 1963
14	Batman prospect	Sec. 4, T. 41 S., R. 18 E.	Bleached and iron-stained pumice tuffs – no cinnabar seen in several open cuts.	No production.	Brooks, 1963.

Controls for the localization of cinnabar are obscure. No persistent fracture trends were noted. Cinnabar is concentrated along poorly defined fractures and coats fragments in brecciated zones within silicified parts of the rock. Small amounts also occur as a fine dispersion in the silica. Most of the ore mined was recovered from a mineralized zone about 40 feet long, 20 feet wide, and 10 to 15 feet deep. Small pods of ore that assay from one to two percent quicksilver were included, but the over-all grade of ore probably would not exceed 0.15 to 0.2 percent quicksilver. Outside this mineralized zone only scattered bunches of cinnabar were found.

Manzanita Group

The Manzanita group prospect is on the west flank of North Butte and Quartz Butte about 2½ miles due west of the Angel Peak mine in the Quartz Mountain area. Mineralization is similar to that at Angel Peak. Cinnabar occurs randomly in intensely altered, opalized flow-banded rhyolite, and associated tuffs as thin coatings and minute disseminations. Several deep bulldozer cuts have explored a wide mineralized zone.

The exploration work done so far has not found the small podlike deposits and stringers to be numerous enough or close enough together to constitute a commercial ore body.

GOLD, SILVER, LEAD, ZINC, AND COPPER

Gold, silver, and associated base metals have been reported from two widely separated locations, the High Grade district and the Brattain district.

High Grade District

Free gold was mined from silicified breccia zones and quartz veins in early Tertiary rhyolite in the extreme southeast corner of the project area. This locality is a part of a larger area in Modoc County of northern California known as the High Grade district. In Oregon it includes several prospects in the hills a few miles east of New Pine Creek, a small community on U.S. Highway 395 about 15 miles south of Lakeview. Gay (1966, p. 100) reports production from the district as a whole of about $85,000 from the period 1909 to 1934.

Brattain District

In this area along the east side of the Paisley Hills, about 5 miles south of Paisley, gold is reported to have been discovered in 1875. About 1900, a man named Gaylord dug a tunnel and several shafts that exposed lead, zinc, and copper minerals with some associated gold and silver. Gaylord is reported to have hired a crew and supported his family from the proceeds of his mining. Since that time only assessment work and location work have been done (Appling, 1950, p. 45). The Gaylord tunnel is in the NE¼ sec. 11, T. 34 S., R. 18 E., at the head of Brattain Canyon (plate 2). The tunnel exposes one of a number of narrow siliceous veins that trend N. 30° to N. 45° W. in the immediate area. Galena and sphalerite are the most prominent metallic minerals. Silver accompanies the galena. The metallic minerals are found in discontinuous lenses and minor disseminations in the veins.

In 1965 copper, lead, and zinc minerals were discovered on the east flank of Ennis Butte in secs. 18 and 19, T. 34 S., R. 19 E., associated with a small stock and dikelike masses of diorite and quartz monzonite. The mineralization appears to be confined to narrow fault zones that trend mainly about N. 60° W. with minor N. 20° E. shears. Mineralization at the surface is spotty and comprises the sulfides, pyrite, sphalerite, galena, and minor chalcopyrite. Several mining companies have made

cursory surface examinations, including surface mapping (Muntzert, 1969) and shallow trenching, but so far no extensive exploration or development has been done. Although silicified rhyolite breccias have been sampled for assay in several other areas, none of these metals was detected.

BLACK SAND

Surface concentrations of black sand containing iron and titanium are present in a broad area about 20 square miles in extent between Scott and Sand Creeks, in T. 31 S., Rs. 7 and 8 E. Thin, lens-shaped concentrations of olivine, augite, hornblende, magnetite, and ilmenite result from the normal fluviatile processes as Sand Creek and Scott Creek meander across the flat area of the Antelope Desert. Small amounts of ilmenite-magnetite sand were also observed on a beach along the east side of Klamath Lake (NW¼ sec. 17, T. 36 S., R. 7 E.). The heavy minerals appear to be derived from the breakdown of pumice and scoria of the glowing avalanche deposits of Mount Mazama described by Williams (1942). The magnetite-ilmenite fraction is low and the present surface concentrations do not appear to have economic significance.

Considerable black-sand thicknesses have been reported by drillers in water wells along the west side of Klamath Marsh and adjacent to Agency Lake and north Klamath Lake. From drillers' logs it is not possible to distinguish between ilmenite-magnetite concentrations and sand composed of fine black cinders. Careful sampling of these reported black sands in future drilling will be required before it will be possible to assess their significance.

Table 7. Diatomite analyses, Klamath and Lake Counties.

Location	SiO_2	TiO_2	Fe_2O_3	Al_2O_3	CaO	MgO	Na_2O	K_2O	SO_3	Cl	CO_2	H_2O^*	Total
North of the town of Sprague River (1) (Sample 227)	65.52	0.86	3.34	14.44	1.56	0.87	0.91	0.42	0.03	0.10	0.04	11.91	100.00
Northeast of Ferguson Mtn., sec. 5, T. 36 S., R. 14 E. (1) (Sample 222)	76.00	0.13	2.03	5.96	0.38	0.23	0.33	0.15	0.17	0.06	0.20	14.36	100.00
Northeast of Merrill NE¼ sec. 25, T. 40 S., R. 11 E. (1) (Sample 232)	75.30	0.45	2.89	8.42	1.90	0.63	0.71	0.32	0.03	0.34	N.R.	9.01	100.00
4½ miles southwest of Klamath Falls (1) (Sample 187)	75.56	0.64	2.66	8.64	1.20	0.37	1.08	0.26	0.06	-	0.11	9.42	100.00
Range of composition of commercial grades of diatomite (2)	85-92%	N.R.	0.8-2.0%	4-10%	0.1-2.0%	0.1-2.0%	0.2 - 1.5%		N.R.	N.R.	0-3% organic material	5-8% L.O.I.	

* by difference.

(1) From Moore, B. N., (1937).

(2) From Leppla, P. W., 1953, p. 2.

XG - 202
Ag, TiO_2

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

2033 First Street
Baker, Oregon

1069 State Office Building
Portland 1, Oregon

239 S.E. "H" Street
Grants Pass, Oregon

REQUEST FOR SAMPLE INFORMATION

The State law governing analysis of samples by the State assay laboratory is given on the back of this blank. Please supply the information requested herein fully and submit this blank filled out along with the sample.

Your name in full James B. Gerking

Street or P.O. Box Box 56 **City & State** Paisley, Oregon 97636

Are you a citizen of Oregon? Yes Date on which sample is sent 8/12/63

Name (or names) of owners of the property U. S. Forest Service

Are you hiring labor? No Are you milling or shipping ore? No

Name of claim sample obtained from North Creek #1

Location of property or source of sample (If legal description is not known, give location with reference to known geographical point.)

County Lake Mining District

Township 34 S Range 16 E Section 13 Quarter section

How far from passable road? 1400' Name of road Paisley, Currier Camp

	Channel (length)	Grab	Assay for	Description
Sample no. 1			Ag, TiO_2	
Sample no. 2				

(Samples for assay should be at least 1 pound in weight)

(Signed) James B. Gerking

DO NOT WRITE BELOW THIS LINE - FOR OFFICE USE ONLY - USE OTHER SIDE IF DESIRED

Sample Description Manganese-stained porphyritic andesite.

Sample number	GOLD oz./T.	GOLD Value	SILVER oz./T.	SILVER Value	TITANIUM TiO_2			
P-28680 XG-202	- - -	- -	Nil	- -	0.20%	- - -	- - -	- - -

Report issued Card filed Report mailed 8/23/63 Called for

SIR-5

XG - 179
Au,Ag

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

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Portland 1, Oregon

239 S.E. "H" Street
Grants Pass, Oregon

REQUEST FOR SAMPLE INFORMATION

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Your name in full James B. Gerking

Street or P.O. Box _____ **City & State** Paisley, Oregon 97636

Are you a citizen of Oregon? Yes Date on which sample is sent 7/22/63

Name (or names) of owners of the property U. S. Forest Service

Are you hiring labor? No Are you milling or shipping ore? No

Name of claim sample obtained from North Creek No. 1

Location of property or source of sample (If legal description is not known, give location with reference to known geographical point.)

County Lake Mining District _____

Township 34 S Range 16 E Section 13 Quarter section _____

How far from passable road? 1400' or less Name of road Paisley Currier Camp

	Channel (length)	Grab	Assay for	Description
Sample no. 1	_____	___	Au,Ag	_____
Sample no. 2	_____	___	_____	_____

(Samples for assay should be at least 1 pound in weight)

(Signed) James B. Gerking

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Sample Description Iron-stained banded rhyolite with glassy streaks and pyrite on fractures. (Black is obsidian & green is the same in part opal).

Sample number	GOLD		SILVER					
	oz./T.	Value	oz./T.	Value				
P-28591 G-179	Trace	- -	Trace	- -	- - -	- - -	- - -	- - - -

Report issued _____ Card filed _____ Report mailed 8/2/63 Called for _____

SIR-5

ACG - 139 & 140
Au, Ag, Hg

STATE OF OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 State Office Building - Portland, Oregon 97201

REQUEST FOR SAMPLE INFORMATION

The State law governing free analysis of samples sent to State Assay Laboratories requires that certain information be furnished the laboratory regarding samples sent for assay or identification. A copy of the law will be found on the back of this blank. Please fill in the information requested completely, and submit it along with your sample. Keep a copy of the information on each sample for your own reference.

M. V. Peterson
P.O. Box 417
Grants Pass, Oregon 97526

Please print your name and address in space above

Date sample is sent: 7/22/68

Name of claim sampled: ?

Name of property owners ?

Are you hiring labor? no Are you milling or shipping ore? no

Location of property or source of sample. (If legal description is not known, give location with reference to known geographical point.)

County Lake Mining district

Township 34 S Range 16 E Section 13 Quarter section SW corner
34 S 16 E 16

How far from passable road and name of road

	Channel (length)	Grab	Assay for	Description
Sample No. 1		x	Au,Ag,Hg	near North Creek campground
Sample No. 2		x	Au,Ag,Hg	South Creek

(Samples for assay should be at least 1 lb. in weight; clay samples for ceramic testing at least 5 lbs.) IMPORTANT: A vein sample should be taken in an even channel across the vein from wall to wall. Location of sample in the workings, together with the width measured, should be recorded.

(Signed) M. V. Peterson

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Description #1 - Rhyolite breccia & gossan.

#2 - Opalized rhyolite with some cinnabar.

Sample Number	GOLD oz./T.	GOLD Value	SILVER oz./T.	SILVER Value	MERCURY Hg			
P-32094 ACG-139	Nil	- -	Nil	- -	Trace	- -	- -	- -
P-32995 ACG-140	Trace	- -	Nil	- -	3.7 #/ton	- -	- -	- -

Report mailed 7-26-68

TG - 101
Hg

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Baker, Oregon

1069 State Office Building
Portland 1, Oregon

239 S.E. "H" Street
Grants Pass, Oregon

REQUEST FOR SAMPLE INFORMATION

The State law governing analysis of samples by the State assay laboratory is given on the back of this blank. Please supply the information requested herein fully and submit this blank filled out along with the sample.

Your name in full Frank A. Melvin

Street or P.O. Box P.O. Box 247 City & State Bly, Oregon

Are you a citizen of Oregon? Yes Date on which sample is sent 5/8/59

Name (or names) of owners of the property Ralph Biles, Bernard Nork, Francis Gardner & Martin Larson

Are you hiring labor? No Are you milling or shipping ore? No

Name of claim sample obtained from Schoolgirl Mine

Location of property or source of sample (If legal description is not known, give location with reference to known geographical point.)

County Lake Mining District

Township 34 S Range 16 E Section 10 Quarter section NW

How far from passable road? Name of road

	Channel (length)	Grab	Assay for	Description
Sample no. 1		x	Hg	several chunks
Sample no. 2				

(Samples for assay should be at least 1 pound in weight)

(Signed) Frank A. Melvin

DO NOT WRITE BELOW THIS LINE - FOR OFFICE USE ONLY - USE OTHER SIDE IF DESIRED

Sample Description Opalite

Sample number	GOLD oz./T.	GOLD Value	SILVER oz./T.	SILVER Value	MERCURY Hg			
P-24102 TG-101	- - -	- -	- - -	- -	3.70 lb/ton	- - -	- - -	- - -

Report issued Card filed Report mailed 5-25-59 Called for

SIR-5

Lake Co. General

28/14

Mineral Exploration in South Central Oregon 1967 – 1968 13

Gulf Oil Co.

1967 - Showed the Lakeview uranium occurrences to Allen Crow and Bill Yarth of Gulf Oil Co. During the tour we visited the White King, Lucky Lass and generally looked over the stratigraphy of the area. This trip continued on into Central Oregon where we looked at the Bear Creek prospect in Crook County. As nearly as I know Gulf has done no work in the Lakeview area during 1968.

Western Nuclear Co.

During the fall and winter of 1967 Western Nuclear ~~co~~ obtained an option from the owners of the White King Mine at Lakeview and their geologist representative Pat Hillard set up an office in Lakeview. During this time Western Nuclear conducted airborne prospecting ~~and detailed~~ in the general area and detailed exploring in the immediate area of uranium occurrences. Some drilling was done during the winter of 1967 and spring of 1968. During June and July of 1968 a detailed drilling program with 3 drill rigs was done at the White King Mine. Western Nuclear has exercised their option and will reportedly continue the drilling program.

Atlantic-Richfield Co.

In July 1968 Mr. Ed Oakes, Senior geologist ~~in~~ charge of uranium exploration for Atlantic Richfield Co. ~~has~~ visited the Lakeview area ~~(summer 1968)~~ and subsequently Atlantic has conducted aerial radiometric surveys covering much of Lake County. These surveys are being evaluated and Ed Oakes has done some field work where ~~these~~ airborne surveys showed anomalies. ~~He~~ Oakes also visited individual uranium occurrences in the Lakeview area during the fall of 1968.

Atlantic Richfield

In ~~August~~ September, Western Nuclear announced their purchase of the Lakeview Uranium Mill (see attached story in Lakeview Examiner)

Geothermal:

Probably because of the U.S. Government policy or no policy for leasing or claiming land for geothermal development there has been no serious interest by anyone in Lake or Klamath Counties during 1967 or 1968.

I discussed the geothermal potential for Klamath + Lake Counties with Evan Just of the Weyerhaeuser Company and I am sure he is adding this resource to other minerals in his current evaluation of Weyerhaeuser lands.

Diatomite -

Diatomite is commonly found in the Oligocene-Pleistocene lake deposits of Klamath County and during our mineral evaluation project in 1968 we collected samples of diatomite from at least 7 separate localities. These were submitted to Johns-Manville at Lompoc, California for preliminary tests. They are still showing interest in diatomite from 2 locations at this time.

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
Telephone: CApitol 6-2161, Ext. 488

Field Offices

2033 First Street
Baker

239 S.E."H" Street
Grants Pass

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LAKE COUNTY'S NEW CONTINUOUS GEYSER

By
Norman V. Peterson*

Introduction

At 1:55 p.m. on July 1, 1959, a new geologic phenomenon was born in Lake County. A spectacular geyser erupted on land owned by Charles Crump, near the community of Adel in southern Lake County. Since that hour, the geyser has continuously sent a column of steam and water in the air to a height in excess of 150 feet.

By definition this geologic phenomenon is not a true geyser. A geyser is defined as an intermittent eruptive hot spring in which the discharge is caused at more or less frequent intervals by the expansive force of highly heated steam. It perhaps more closely fits the description of smaller continuous eruptions in Yellowstone National Park that Allen and Day (1935) called "perpetual spouters."

The Crump Geyser, as it has been named, resulted from a well drilled by the Nevada Thermal Power Company, the exploratory division of the Magma Power Company of 631 S. Witmer Street, Los Angeles 17, California. This company is conducting a systematic drilling program in Oregon, California, and Nevada in its search for natural superheated steam (300°F.) that may be harnessed for the generation of power.

After drilling to a depth of 1,684 feet and not finding sufficiently hot water, the company abandoned the well on June 29, 1959, and released it to Mr. Crump. The well remained quiet until sometime between 12:00 and 1:15 p.m., July 1. Mr. Crump arrived at the well just after 1:15 and could see that the hole had been cleared of drilling mud and debris by an eruption that had barely ceased. Boiling water was present at the top of the well casing. At 1:55 p.m., as Mr. Crump and a neighbor watched, the geyser erupted again with a terrific rumbling and since then has been continuously active.

Well data

Measurements of the temperature, flow, and velocity of the Crump Geyser have been obtained from the Oregon State Engineer's Office. Analysis of the water was provided by the State Sanitary Authority. Statistics on the well, drilling history, and well cuttings were submitted by the Nevada Thermal Power Company. Some of these data are given as follows:

Depth of well: 1,684 feet.

Type rig: Rotary.

Spud date: 6/21/59. Completion date: 6/29/59.

Size of hole: 12¼ inches to 335-foot depth.
8-3/4 inches to 1,684-foot depth.

Casing: 15 feet of 20-inch casing.

Height of eruption: 150 to 200 feet.

Velocity of flow: Average - 67 ft./sec.

Water temperature at edge of casing: 200° ± F.

Water flow: 400 to 600 gal./min.

Radioactivity: U_3O_8 - trace (determination by Lakeview Mining Company).

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* Geologist, State of Oregon Department of Geology and Mineral Industries.

Water analysis: (determination by State Sanitary Authority)

Turbidity	4*
Color	3
Total solids	956
Suspended solids	9
Carbonate alkalinity	30.3
Bicarbonate alkalinity	73.7
Hardness (as $CaCO_3$)	23.2
Chloride (Cl)	235
Sulfate (SO_4)	130
Arsenic	0.5
Copper	1.0
Nitrate nitrogen	0.37
Phosphate (PO_4)	0.58
Iron (Fe)	1.0
Manganese (Mn)	1.0
pH	8.75

* All results except for pH are in parts per million.

Temperature record: (determination by Nevada Thermal Power Company)

Date	Depth	Temperature
6/22/59	40 ft.	170° F.
6/24/59	199	215
6/26/59	660	230-250
6/27/59	1,004	160
6/28/59	1,618	not determined
6/29/59	1,684	hole bridged

Bottom-hole temperatures using maximum recording thermometers.

Additional measurements made on September 10, 1959, show the continuous activity of the "perpetual spouter" to be very much the same as when it began on July 1. The temperature was 210° at the top of the casing, the height of eruption about 195 feet, and the flow of water estimated to be 500 gal./min. A noticeable white siliceous material was beginning to coat boulders and pebbles around the well.

Distribution of hot springs and geysers

The Crump Geyser, located in sec. 34, T. 38 S., R. 24 E., is at the base of the prominent fault scarp along the western edge of Warner Valley between Pelican and Crump lakes. It is 3.8 miles north of Adel and 200 feet west of the Adel-Plush road. Besides this geyser there are several warm and hot springs in the area. They occur in an elongate north-trending zone which is shown on the accompanying geologic map. Extinct hot springs are indicated also by low mounds of calcareous and siliceous tufa, especially at the north edge of Pelican Lake. It is interesting to note that the new geyser has inactivated a hot spring about 100 yards due east and a true geyser about 100 feet to the north.

A group of similar, exceptionally hot springs and man-made geysers occurs just north of Lakeview, 35 miles to the east, at the base of the Goose Lake scarp. Two geysers in this group (Hunters Hot Springs) resulted from shallow wells and are probably "perpetual spouters." "Old Perpetual," a familiar landmark in the Lakeview area, is a 50- to 60-foot spouter. "The Teakettle" to the east at the base of the hill has been controlled for use in heating a housing development.

The association of a narrow thermal-spring belt and a fault scarp is a characteristic pattern for most of the thermal springs in this region including those in the northern parts of California and Nevada (Stearns, Stearns, and Waring, 1935).

Source of thermal waters

The source of heat for thermal springs has been studied in some detail (Sosman and others, 1924) and is generally believed to be from hot igneous rock that lies at a moderate depth beneath the surface. The heat is derived both from contact with the hot rock and from superheated steam and gases that mingle with and heat meteoric water (rain water) which has percolated downward. Still another source of heat is that generated by friction during shearing and crushing in zones of major faults. Chemical reactions and contained radioactivity have been considered as another source but are believed to be minor.

The source of the water if flow is large can be another problem. From studies made in both Yellowstone National Park and at Lassen Volcanic National Park, Allen and Day (1935) and Day and Allen (1925) concluded that the water in hot springs is chiefly from surface water which has percolated downward and returned to the surface, but that a small portion of the water is derived from an underlying magma or batholith in the form of superheated steam and gases.

Geology of the map area

Warner Valley, in which the Crump Geyser and other thermal springs occur, is near the northern limit of the Basin and Range Province, a region of fault block mountains and valleys. This long, undrained basin-type valley has resulted from late Tertiary to Recent block faulting and is bounded on both east and west by large tilted fault blocks. The geology for this report was based on a reconnaissance of the steep east-facing fault scarp along the western edge of the valley. The only significant canyon in the scarp occurs just west of Adel where Deep Creek, which drains the area to the southwest, has cut a deep valley almost at right angles to the rim. The Deep Creek canyon also exposes the same volcanic rock sequence that is found in the escarpment.

All of the rocks exposed in the scarp face are Tertiary volcanics. There are three definite units: a lower sequence of basalt flows; an overlying tuff unit consisting of a thin lapilli tuff layer and a welded tuff flow; and about 400 feet of capping basalt flows. These rocks appear to overlie one another conformably. In general they strike nearly north and dip about 5° to the west.

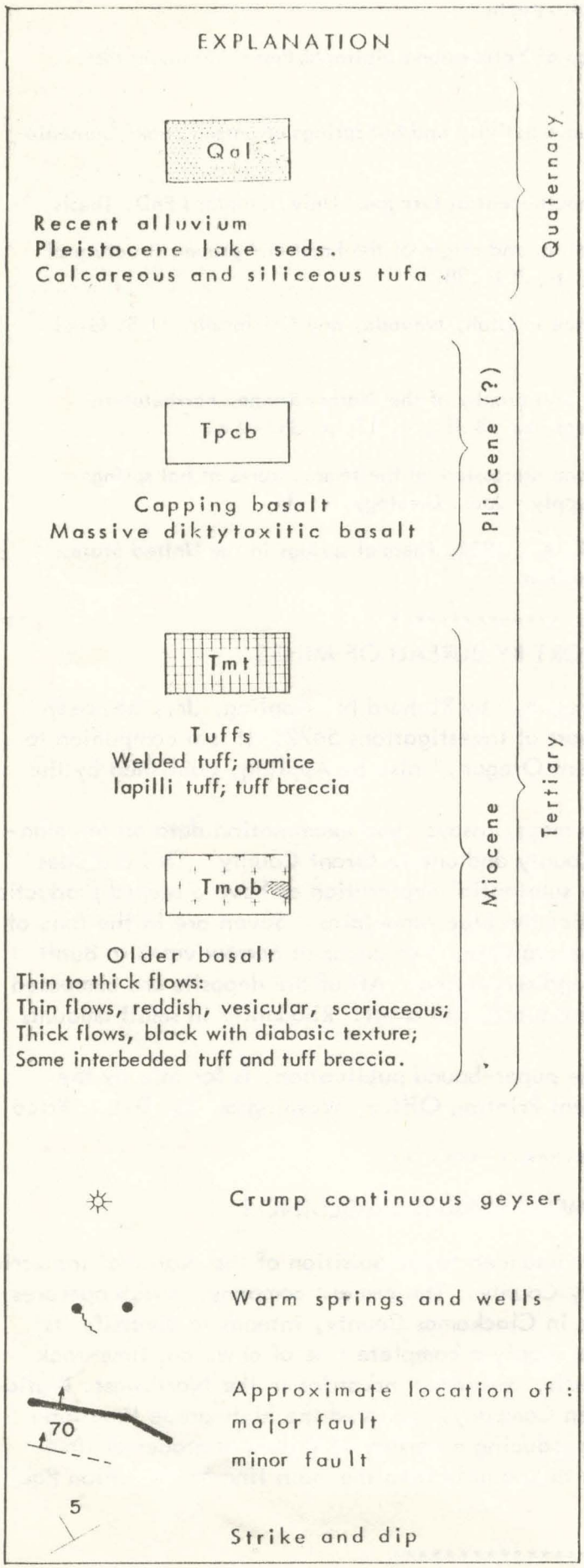
Older basalt: The basalt flows that make up this thick unit crop out from 4,525 feet in elevation on the valley floor to about 6,000 feet in elevation high up on the steep scarp. Massive black, dense, coarse-grained olivine basalt flows make up about 50 percent of this unit. The rock has a diabasic texture and weathers easily to a granular black sand. Interbedded with these flows are thin to thick, dark-gray to reddish vesicular and amygdaloidal flows, many of which are scoriaceous to ropy on flow surfaces. Within the sequence of older basalt there are at least two horizons of pumice lapilli tuff and tuff breccia. From a check of the ditch samples of the Crump well it appears that, except for the first few tens of feet of alluvium and rubble, the entire hole is drilled in rocks similar to the older basalt. This unit may contain as much as 3,000 feet of basalt flows with minor pyroclastic rocks. (See Section A-A'.)

Tuffs: Above the older basalt sequence is a persistent unit comprising a massive light-tan pumice lapilli tuff and an overlying gray welded tuff. The thickness of this unit is variable and from isolated outcrops in the scarp face is estimated to be from 100 to 200 feet thick. In the Deep Creek canyon to the west, however, it appears to thicken considerably. George Walker of the U.S. Geological Survey (personal communication) has reported finding vertebrate fossils from this horizon that have been identified as a Mascall fauna equivalent, making these rocks of probable upper Miocene age.

Capping basalt: Above the tuffs are the cliff-forming capping basalt flows or "rim rocks." These light-gray, massive, olivine basalts make up the topmost 400 feet of the scarp rim. Individual flows vary from 10 to 50 feet in thickness, are vesicular, and have a diktytaxitic texture similar to many of the late Tertiary basalt flows in this part of Oregon. A rude columnar jointing in the thicker flows facilitates breakage of the rocks into large rectangular blocks that form steep talus piles from which some blocks roll all the way to the valley floor. (Early Indians used these large, smooth-surfaced blocks on which to carve their petroglyphs, and many fine examples can be seen along the Hart Lake narrows just north of Crump Lake.)

Quaternary alluvium: Lacustrine sediments that include gravels, sand, and silt cover the floor of Warner Valley. These horizontal beds (from a fraction of an inch to a few feet in thickness) can be seen in road cuts in the vicinity of Adel. The Quaternary lake in which the sediments were deposited was much larger than the small lakes that are now found in the valley. This is shown by former terraces and shorelines as much as 100 feet above the valley floor. No information is available on the thickness of the sands and gravels except that beds totaling at least 60 feet were measured in the vicinity of Adel. Adel, however, is located on the alluvial fan resulting from the entry of Deep Creek into the Warner Valley and the sediments at this point may not be representative of thickness in the whole valley. Former sites of hot springs are indicated by local mounds of white to light-gray siliceous sinter and calcareous-coated pebbles and boulders within the alluvium.

Structure: Tertiary volcanism accompanied by faulting as late as Recent times is responsible for the present topography of the region. There are two predominant fault directions, one trending northwest and the other northeast. Most previous workers in the region, Donath (1958), Nolan (1943), Fuller and Waters (1929), and Russell (1928), have interpreted the faults to be normal high-angle with dominantly dip-slip movement. During the brief reconnaissance for this report, slickensided fault planes were found at two locations about 2 miles apart. At both locations the faults are normal. They strike N. 10° E. and dip from 70° to 75° to the east. The major fault along the western edge of Warner Valley is believed to be a high-angle normal fault and its approximate location as interpreted from topography and aerial photographs is shown on the geologic map.



Origin of Crump Geyser

From a study of the well cuttings and the log of the drilling history of the well it appears that the geyser is just east of the fault zone. Circulation was lost and temperature increased from 180 to 200 feet. This zone was interpreted as the location of the fault at depth. After passing through this fault zone the hole appears to penetrate altered rocks very similar to the older basalt and pyroclastic sequence. A second hot zone which was encountered at 660 feet could be either a scoriaceous or vesicular interbed or possibly another fracture within the complex fault zone. Most of the heat probably originates from a cooling lava mass, and the faulted and sheared zone provides a conduit for superheated water to escape upward from considerable depths. The ropy scoriaceous surfaces of the thin reddish flows within the older basalt should make excellent aquifers through which surface waters could easily percolate. It appears that the volcanic rock sequence east of the fault dips gently to the west beneath Warner Valley and these dipping flows may provide an adequate source of water for the geyser and hot springs.

Future of Crump Geyser

Much has been written about the value of this spectacular geyser as a scenic attraction and, even though it is remote from well-traveled highways (35 miles east of Lakeview), if it continues to spout, its fame should grow. At the present time the runoff water is irrigating a small pasture area before draining into Crump Lake through a system of canals. Further usage of the water for irrigation and domestic animals is being considered by Mr. Crump pending a complete interpretation of the chemical analysis of the water by agricultural experts.

Acknowledgments

Grateful acknowledgment is made to Mr. Charles Crump for his assistance which was given freely and in many ways. Acknowledgment is also made to the State Engineer, Mr. Lewis A. Stanley, and to Mr. Jack Sceva, groundwater geologist on his staff, for their fine cooperation in furnishing well data, advice, and other information.

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NEW MANGANESE REPORT BY BUREAU OF MINES

"Manganese deposits of northeastern Oregon," by Richard N. Appling, Jr., has been published by the U.S. Bureau of Mines as Report of Investigations 5472. It is a companion to R.I. 5369, "Manganese deposits of southwestern Oregon," also by Appling, published by the Bureau in 1958.

The northeastern Oregon report presents maps, assays, and examination data on ten manganese deposits, nine of which are in Baker County and one in Grant County. This includes all deposits in the region that have undergone substantial exploration or have a record production. All of the deposits occur in Pre-Tertiary rocks of the Blue Mountains. Seven are in the form of small, irregular pods or lenses in Elkhorn Ridge argillite; two occur as narrow veins in Burnt River schist; and one deposit is in greenstone and serpentine. All of the deposits are composed of manganese oxides, intermixed with abundant quartz and chert. Rhodonite in small amounts was noted at several occurrences.

Report of Investigations 5472, a 23-page paper-bound publication, is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Price is 25 cents.

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OREGON PORTLAND CEMENT EXPANDS HOLDINGS

Oregon Portland Cement Company has announced the acquisition of the National Industrial Products Company operation at Durkee, Baker, County. The cement company, which operates plants at Lime in Baker County and at Oswego in Clackamas County, intends to diversify its production, presently confined to cement, and supply a complete line of chemical lime-rock products for sugar mills, paper plants, steel mills, and other industries in the Northwest. National, a wholly owned subsidiary of Morrison-Knudsen Company, explored the high-grade limestone deposit near Durkee early in 1954 and began producing a variety of sizes and grades of limestone a few months later. The property is less than a mile from the main line of the Union Pacific Railroad and U.S. Highway 30.

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GOVERNOR ENDORSES COMMITTEE'S STUDIES

Governor Mark Hatfield pledged his support of the resolutions and recommendations of his Mining Advisory Committee at a conference in the State Capitol September 22. The resolution and recommendations of the Committee were prepared at a meeting of the Western Governors Mining Advisory Council in Sun Valley July 8 and 9, and put in final form at a second meeting in Denver on September 15. The summary of the resolution, as presented to the Governor, stated:

> BE IT RESOLVED that the maintenance of a healthy metal mining industry in the United States is of the utmost economic importance to the Western States, both for themselves and as major markets for Eastern States' manufacturers, and is as well, of the utmost importance to the national security, and that such a healthy industry may be maintained by joint action of the Administration and the Congress by:
>
> (1) Adopting and implementing without delay an adequate national minerals policy which would assure the maintenance of a healthy domestic mining industry, and
> (2) Taking all steps which may be needed to assure to the domestic mining industry at least one-half of the domestic market, or the present proportion of the domestic market (whichever is higher) either by adequate tariffs, excise taxes, or quotas, or, for the minor metals, allocation of import receipts, or such combination of these as may be most suitable.

Recommendations for 20 domestically mined metals were discussed with Governor Hatfield. Of immediate concern to Oregon's mining industry were the recommendations on quicksilver and chrome. These were:

> Mercury: That an annual quota (or tariff) be imposed on imports to preserve something over one-half of the domestic market.
>
> Chrome: That small excise taxes (or tariffs) be imposed on foreign imports, the proceeds from which should be sufficient when distributed among United States producers to maintain a healthy nucleus of domestic production.

Governor Hatfield was instrumental in convening the meeting of the Western Governors Mining Advisory Council in Sun Valley. In April he addressed a letter to Governor Smylie, Chairman of the Western Governors Conference, suggesting a meeting of the mining people of the western states in order that recommendations could be formulated which might correct the low ebb of mining activity current throughout the West. Appointees to Governor Hatfield's Mining Advisory Committee are: Hollis M. Dole, Chairman, Portland; Harold Banta, Baker; Fayette I. Bristol, Grants Pass; Les Child, Grants Pass; William W. Gardner, Canyon City; Clint P. Haight, Jr., Baker; Pierre R. Hines, Portland; William Kennedy, Portland; Bruce J. Manley, Medford; Earl S. Mollard, Riddle; and Dr. Garth W. Thornburg, Lakeview. Officers of the Western Governors Mining Advisory Council elected at the Denver meeting September 15 are: Chairman Clark L. Wilson, Vice President, New Park Mining Company, Salt Lake City, Utah; Vice Chairman, W. G. Maloney, Manager of the Mining Association of Montana, Butte, Montana; and Sec.-Treas. Frank P. Knight, Director of Department of Mineral Resources, Phoenix, Arizona.

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MIKE BROWN WINS TROPHY

Michael Brown, a senior at Washington High School and a student assistant for the Department, won the Barclay Adult Fossil Trophy at the National Gem Show which was held at the Annual Convention of the American Federation of Mineralogical Societies in the Portland Public Auditorium September 5, 6, and 7. This is the first time the Barclay Adult Trophy has been awarded. Mike, who has won a number of top awards for his fossil displays, qualified for the national competition by winning first place in fossil exhibits at the Northwest Federation of Mineralogical Societies show in Pasco last year. His display at the National Gem Show consisted of vertebrates, invertebrates, and plants.

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GOLD MINERS CAN'T WIN

It will be recalled that the gold miners, after more than ten years in the court, were turned down by the Supreme Court for relief as the result of War Production Board Order L-208 which declared that gold was a nonessential material and therefore not to be mined during World War II. Miners felt that relief was due them, as the closure made it prohibitive to reopen their properties after the war.

Another avenue of attack which might have brought relief to the miners has been traveled by the law firm Seitz, Easley & Whipple, Portland. This firm, under the guidance of attorney Norman L. Easley, has been challenging the legality of the United States Treasury establishing the price of gold at $35 per ounce under the Gold Reserve Act of 1934. Mr. Easley has furnished the Department a brief summary of the actions he has taken in pursuing this legal battle.

> On August 10, 1954, we filed in behalf of Mrs. Gladys Laycock a damage action under the Tucker Act against the United States for damages. The action was filed in Oregon upon an implied contract for compensation for property taken in violation of the due process clause of the United States Constitution. The action was dismissed, an appeal was taken and on June 11, 1956, the Court of Appeals affirmed the dismissal. We thereupon took out a writ of certiorari to the Supreme Court of the United States, without success.
>
> The foregoing action was a damage action at law and the result conclusively showed that plaintiff was without a remedy at law. Thereafter, on June 28, 1956, we filed a declaratory judgment in a suit for injunctive relief against Mr. George Humphrey, Secretary of the Treasury. After having been served in Washington, D. C., Mr. Humphrey refused to make an appearance and therefore we did not have jurisdiction. Thereafter, on August 30, 1956, we filed the same against Mr. Humphrey's representative in Oregon, Frank J. Kenney, asking the court to enjoin him from enforcing the Gold Reserve Act of 1934 and the Gold Regulations issued thereunder. Since an act of Congress was involved, the statute required a three judge court. On April 8, 1957, our motion to convene the three judge court to decide the constitutionality of the Gold Reserve Act was denied. We thereupon applied to the Supreme Court of the United States for a writ of mandamus to enforce the calling of a three judge court. That writ was denied. Thereafter, we amended the complaint against Mr. Kenney, who incidentally is the head of the Secret Service in Oregon, and eliminated any reference to the Gold Reserve Act of 1934. Rather we challenged the constitutionality of the Gold Regulations which are promulgated by the Treasury Department of the United States. Upon exhaustive hearings the motion allowing dismissal of that complaint was entered. Thereafter, we appealed to the Court of Appeals in San Francisco, with the result noted in the news item (see below). It will be our next step to appeal to the Supreme Court in the hope that our justiciable claim will be recognized.

The news item referred to by Mr. Easley is given below. It was an Associated Press dispatch dated September 2, 1959.

> The U.S. Court of Appeals ruled Tuesday that Congress and the secretary of the treasury were acting within constitutional powers in regulating the sale and processing of gold in the United States.
>
> The appeals court's opinion, written by Gilbert H. Jertberg, said Congress acted within its constitutional powers authorizing it to provide a "sound and uniform currency for the country." Mrs. Laycock's allegation "that the price has ruined the gold mining industry, even if true, is beside the point," the appeals court said. "The act was not intended to encourage gold mining; it is concerned only with the monetary system of the United States. Under it the secretary is not required to consider the condition of the gold mining industry in setting the price; he need only be concerned with carrying out the policy of Congress as expressed in the act." The appeals court said that this policy "may be found wanting in a purely political matter, the wisdom of which is not for this court to decide. Our concern ends upon a showing that Congress in adopting a policy acted within its constitutional authority."

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MINERALS RESOLUTION APPROVED

A resolution (House Concurrent Resolution 177) requesting the President to review present government minerals policy and report promptly to Congress on steps he proposes to aid depressed branches of the mining industry, was approved August 26 by the House of Representatives and September 1 by the Senate Interior Committee. Rep. Wayne N. Aspinall (Colorado), the sponsor of the resolution, stated in House debate that the hearings held before his Committee contained statements of 21 members of the House, 2 State Governors, and 67 other persons. (William W. Gardner, President of the Grant County Miners Association, and Hollis M. Dole, Director of the Oregon Department of Geology and Mineral Industries, testified on mineral conditions in Oregon.) The hearings showed, according to Aspinall, that the health of most segments of the mining industry was "desperate." Aspinall said the rising unemployment in mining areas is disturbing and added, "Perhaps more disturbing is the seeming excessiveness to which our government has gone in sacrificing the well-being of our mining and mineral industries and the workers who compromise them to accomplish our foreign policy objectives. When our foreign policy conflicts with our domestic mining policy, it seems that the latter has been sacrificed at times, ruthlessly."

Rep. Al Ullman (Oregon), who testified before the Committee hearings, stated on the House floor:

> As a sponsor of identical legislation and as a member of the Interior and Insular Affairs Committee, I urge prompt enactment of this legislation. It is indeed paradoxical that our mining industry has been allowed to languish at the very time when the mineral needs of the Nation are expanding. Nearly everyone agrees that our country stands on the threshold of an era of unparalled economic expansion. All agree that natural resources will be required for this economic development. Yet, mines continue to close, domestic production continues to fall and chronic unemployment continues as the norm for the Nation's miners. I believe this is a serious situation requiring immediate remedial action. From the standpoint of a sound economy, it is essential that a stable domestic mining industry be fostered; from a standpoint of our national defense, it is equally essential to develop domestic mineral reserves adequate for any foreseeable national emergency. We in the West are proud of the role mining has played in the development of our section of the Nation. We are confident that mining can be of equal importance to our present economy. Rich deposits of mineral wealth exist throughout the West. Small independent mining operators stand ready to insure the proper and expeditious development of these natural resources. All that is lacking is a national policy providing necessary incentives for the expansion of this essential industry. Passage of the legislation now under consideration will effectively declare congressional dissatisfaction with the lack of a mining program and congressional support for a policy of encouragement for the discovery and development of mineral wealth.

Many other Congressmen supported the legislation, among whom was Mr. Simpson of Pennsylvania who stated in part:

> The debate that has occurred in connection with this resolution must point up to each member present that this legislation purports to deal with a very limited field in which the great difficulty confronting the employees in the mining industry finds a similar relationship in many industries in the country. Reference was made to the reciprocal trade agreements program, to which I personally attribute a great many of the ills that are reflected in unemployment in industrial and mining areas of the Nation. With the reciprocal trade agreements program and the so-called commitments we have made under that program, we are limited in the relief which Congress can give to the unemployed miner and to the unemployed worker in many of our industries. While we might want to exercise our jurisdiction as legislators in the Congress of the United States and pass a law directing that this or that be done to help the unemployed miner by safeguarding his job against destructive imports or to help the gentleman who is unemployed in industry because of cheap foreign imports, we find that we cannot do it without paying a penalty through compensatory tariff cuts. Very often we forget that these alleged reciprocal trade agreements in fact have not proved to be reciprocal, and we are the ones who make the sacrifice and the other nation does not abide by its concession made to us. Time after time it has been proved that when these negotiators of ours make their agreements abroad and come back home, we find that unhappily the other country, hardly before the ink is dry on the agreement, through depreciating their currency or voiding the

agreement, have, in effect, wiped out the concession which they made to us. In fact, instances exist where the foreign country raised more barriers against American exports abroad than there were at the time we started with the reciprocal trade agreement program. American manufacturers today cannot ship many American produced articles into Western Europe because quota barriers and other trade restrictions have been raised against our exports. Today Congress is called upon to consider legislation which will authorize American business to send our dollars abroad to build plants, under the promise of preferential tax treatment so that we can service markets from factories we are to build abroad. Under the reciprocal trade agreements program, where we undertake to protect an industry providing domestic jobs, we have to, in effect, obtain permission of the GATT (Geneva Agreement on Tariffs and Trade) member countries and, if a member country asks us to make concessions in some other area as compensation, we have to pay dollar for dollar for the protection we have bought for the American worker. This reciprocal trade program, I repeat, is not reciprocal because we do not get the concessions that are promised. We do not insist on them. We sit back and let the other countries have their way with us. And then if and when - and a case in point is in front of us right now - if and when we want to protect the jobs of our own workers, if we want to reopen certain mines which under the reciprocal trade program are facing unfair competition, we have to pay the other country by making concessions in some other field of industrial output.

Even though Congress approves the resolution, which seems likely, the Administration could continue to take no action. A resolution of this type does not have the force of law. It merely expresses the desire of Congress. Interior Secretary Seaton recently reiterated that the Administration, rebuffed by the House last year when it defeated the Seaton minerals stabilization plan, would let Congress initiate any new minerals program.

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SEPTEMBER LAND WITHDRAWALS

The U.S. Bureau of Land Management has notified the Department of two withdrawals this month. Withdrawal No. 60-1 is an application from the U.S. Forest Service for the withdrawal of 6,470 acres in strips 330 feet each side of the center line of the following highways:

Willamette State Highway 58 - T. 23 S., R. 6 E.; T. 24 S., R. 7 E.; T. 25 S., R. 7 E.; T. 25 S., R. 8 E.; and T. 26 S., R. 8 E.

Fremont State Highway 31 - T. 23 S., R. 11 E.; T. 24 S., R. 11 E.; T. 25 S., R. 12 E.; and T. 25 S., T. 13 E.

Santiam U.S. Highway 20 - T. 13 S., R. 7½ E.; T. 13 S., R. 8 E.; T. 13 S., R. 9 E.; T. 14 S., R. 9 E.; T. 14 S., R. 10 E.; and T. 15 S., R. 10 E.

McKenzie U.S. Highway 126 - T. 14 S., R. 8 E.; T. 14 S., R. 9 E.; T. 15 S., R. 8 E.; T. 15 S., R. 9 E.; and T. 15 S., R. 10 E.

Cascade Lakes Forest Road 46 - T. 18 S., R. 8 E.; T. 18 S., R. 9 E.; T. 18 S., R. 10 E.; and T. 18 S., R. 11 E.

This is the third withdrawal this year by the U.S. Forest Service for roadside zones to "protect and preserve the aesthetic value of the highways." As usual, these withdrawals are subject to valid existing rights but will prevent appropriation under the general mining laws. Total acreage proposed for withdrawal this year by the Forest Service for roadside strips now amounts to 11,591 acres.

The second application for withdrawal (No. 60-2) of land is for 115 acres in T. 11 S., R. 12 E., Jefferson County. This withdrawal notes as an exception the general mining laws and mineral leasing laws. All other forms of land appropriation will be banned.

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
1069 State Office Building, Portland 1, Oregon

PUBLICATIONS*

BULLETINS**

		Prices (subject to change)
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
8.	Feasibility of steel plant in lower Columbia River area, rev. ed., 1940: R. M. Miller	0.40
14.	Oregon metal mines handbooks: by the staff	
	C. Vol. II, Section 1, Josephine County, 1952 (2d Ed.)	1.25
	D. Northwestern Oregon, 1951	1.25
16.	Field identification of minerals for Oregon prospectors and collectors (rev. ed.), 1954: compiled by R. C. Treasher	1.00
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
33.	Bibliography (supplement) of the geology and mineral resources of Oregon (2d printing) 1958: J. E. Allen	1.00
34.	Mines and prospects of the Mt. Reuben mining district, Josephine County, Oregon, 1947: E. A. Youngberg	0.50
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
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
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
49.	Lode mines of the central part of the Granite Mining District, Grant County, Oregon, 1959: Geo. S. Koch, Jr.	1.00
50.	Field guidebook - geologic trips along Oregon highways, 1959: Prepared under direction of W. D. Wilkinson	1.50

SHORT PAPERS

2.	Industrial aluminum - a brief survey, 1940: Leslie L. Motz	0.10
4.	Flotation of Oregon limestone, 1940: J. B. Clemmer and B. H. Clemmons	0.10
7.	Geologic history of the Portland area, 1942: Ray C. Treasher	0.25
13.	Antimony in Oregon, 1944: Norman S. Wagner	0.25
14.	Notes on building-block materials of eastern Oregon, 1946: Norman S. Wagner	0.15
17.	Sodium salts of Lake County, Oregon, 1947: Ira S. Allison and Ralph S. Mason	0.15
18.	Radioactive minerals the prospectors should know (2d rev.) 1955: White and 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

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, Oregon, 1939: F. G. Wells and others	0.40
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 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.	0.25
Geologic map of the Valsetz quadrangle, Oregon, 1947: E. M. Baldwin	0.25
Preliminary 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 Coos Bay quadrangle, 1944: J. E. Allen and E. M. Baldwin (sold with Bull. 27)	----
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 (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
7.	Bibliography of theses on Oregon geology, 1959: H. G. Schlicker	0.50

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

* A complete list of publications will be mailed upon request. Please include remittance with order. Postage free.

** Missing report numbers out of print.

7/8/59

Uranium Project - General

The uranium project was scheduled for completion to the point of producing some kind of a publication this year. Plans may have to be changed.

At the present time the White King is the only uranium mine worthy of the name. The Lucky Lass is a "producer" but at the present time seems to have very little reserves. On the other hand, the reserves at the White King are extensive and offer the best chance for a large uranium operation.

It is amazing no other good prospects have been turned up by this time. It would be very strange if these two properties turn out to be the only producers in the area. There should be more. The principal objects of the project should probably be answers to the questions: Why are deposits here; where are some more, and if there are no more, why not. Good luck.

Since the White King, and to a lesser extent the Lucky Lass, offers about the only real starting place, most of the time should be spent in Lake County. There are several other occurrences of academic interest that should be studied, namely the Salem Hills and Paval Butte occurrence. Also, some data on all the radioactive occurrences even though they may be of absolutely no importance.

The work in Lake County was mainly in three parts: a detailed map of the mine area using areal photos conned from the A.E.C. The scale is about 435'/inch. Secondly, recon mapping on quadrangle sheets (no topog) at 1:62,500 or 1:31,680. Third, very broad recon to try to correlate with rocks in mapped areas (to north). Incidentally, the U.S.G.S. has a topog map (100' contour intervals) at some enormous scale which might be of value. Small?

This map should be obtained for reference, and might possibly be of some use in the mapping of the area.

The A.E.C. may put a man in the area full-time, if so it will probably be Perry Halstead of the Reno office who has done most of the work in the area. The Reno A.E.C. has been very helpful with information. A conference with these people and a several days in the field with them might be helpful.

The U.S.G.S. is planning to map the SE¼ of the state starting in 1957 or 1958 under George Walker, probably. This should probably take a couple of years, and might be very interesting work if they could see their way clear to include a department geologist in the project. Actually, the mapping of the quadrangles in and around the map area would fit both the G.S. and the State projects very nicely.

The amount of work to be done in other areas is doubtful. Probably particular problems should determine this. The Salem area is interesting enough to keep a close watch on this area and to do enough to get a good idea on the origin of the deposit. The Bear Crk. deposit in Crook County will bear watching. They were planning on doing drilling. I personally doubt if there is much of a deposit there, but it is an occurrence of identifiable minerals. Wagner has an occurrence in his area which nothing has been said about. The guy who has it is bashful, I guess. The Powell Butte deposit may have an interesting origin but not much else.

This leaves Lake County for any extensive work. Have fun.

Uranium Thus Far

Lakeview Area

Introduction -- Practically two full summers of field work have been spent by Schafer and several weeks time have been spent by other personnel (Wagner, Corcoran and Schlicker) on various aspects of the uranium project. Time other than Schafer's has been spent principally in property inspections other than Lakeview.

Principal area of interest is Lakeview where the White King could well become a good producer. This property is the only one in which any good competent work has been done. The success of this deposit rests upon the building of a mill or up-grading plant, as the ore is too lean to ship to the nearest mill at Salt Lake City.

The property was discovered and is owned by Lakeview people who have leased it to Thornburg Bros. of Gunnison, Colo. It is now Lakeview Mining Company. Thornburgs have other mining properties, one in Gunnison where they just got authorization to erect a mill. They are backed by some Texas oilmen. The geologist's name is Howard Dutro, the mine sup. is Jim Polous.

This mining company seems sometimes to leave much to be desired in their operation. Principal is the lack of a trained mining engineer. Dutro is a good geologist and has run an intelligent exploration program on the White King main claim. Most of the exploration has been done on one or two claims generally east to south of the discovery pit. This is because of the hurry to develop significant tonnage of ore quickly.

Exploration has been done with diamond drill rigs generally using plug or non-coring bits. Attempts to recover core are generally futile because of the different degrees of hardness and brittleness and the

fractured nature of the ground.

General Geology - Age -- Much reconnaissance has been done but very little concrete facts have been noted.

Generally, the rocks present are predominantly flows, tuffs and tuffaceous sediments of Pliocene (?) or Plio-Pliestocene (?) age. This is nothing more than a guess.

Evidence for this is as follows: (1) A roadside recon. from Bend to Lakeview to attempt a correlation with Dalles fm. and Tcr was inconclusive. If anything, it appeared that Dalles equivalent could be traced to Silver Lake and that the flows and tuffs of Abert Rim were below Dalles.

At Silver Lake, areas of heavy faulting begin, and continue southward. The block bounded by Abert Rim on the west and Adel and Plush on the east is relatively undisturbed. If the criteria of "the more deformation, the older the rocks" holds true in this area, the rocks to the west of Abert and Goose Lakes are older. This may not be the case, however.

It is entirely possible that there are beds ranging from Oligocene John Day time (See letter to Shotwell and answer, Sept. 18 & Oct. 1, 1956). This occurrence of John Day seems to be authentic although it was not confirmed by me. (Try Tex Britton and (Mr. & Mrs.) Louis and Estelle Johnson in Paisley for the locality Shotwell mentions.) If this information is true, and there is not too much reason to doubt it, the rocks in Lake County could range all the way from Eocene to Recent.

Correlation may be made also from the west, near Klamath Falls. The two references on this area are a thesis by E. Allen Mereweather (about 1952) and an unpublished water resources study of Klamath County by Meyers of the U.S.G.S. Bedrock, according to these references is Plio. or Plio.-Plies. The only half-way decent job done on Lake County is an unpublished

water-resources map with geology by F. D. Trauger who has Olig.?-Miocene as the oldest rocks in the county. He has no John Day, as such, on his map. This is a quick recon. job but might be pretty good. It can be improved upon, however.

Another angle which might be worked is the diatomite. Diatomite 3 miles W of Paisley. There is diatomite in Klamath County and there should be some in Lake County, possibly in the rim above the Summer Lake store. An age determination might be obtained from material such as this.

If any correlation can be made from beds from other parts of the state, the rocks in the Lakeview area would probably be closer to Pliocene Dalles fm. than anything else. This fact probably means little or nothing, however.

Vistillas 1, Oregon, Quadrangle

Some detailed mapping has been accomplished in the S½ of this quad. It was done on a scale of about 1 inch = ½ mile. Not much of any value has been determined from this mapping.

Mapping is difficult because of the poor exposures of all rocks except the hard basalt or rhyolite flows.

Present are volcanic rocks, flows and tuffs and tuffaceous sediments. Later sediments have filled recent stream valleys.

A tentative column (older to younger) is as follows: Extensive deposits of tuffs, and tuffaceous sediments with inter-calated olivine basalts; lighter colored tuffs, tuffaceous sediments and rhyolite (welded tuff?). Above (?) this is a restricted flat basalt flow lying above older basic tuffs near upper Thomas Creek. This flow is the only flat struc-

ture in the area, hence its youth.

To the east of the mine area (and the Vistillas 1 quad) on the Augur Crk. road is a series of thick basalts which may be an older series. However they seem to be conformable.

The older tuffs and flows are present in all of the S½ of the Vistillas quad. except the area north and just south of Cox Flat, to the west of Cox Flat where the higher ridges are covered with the before-mentioned flat-lying basalt. This belt of older rocks is cut by Augur, Thomas, Drews, Howard and Cottonwood Creeks.

The basalt flows are the most distinctive part of the older volcanic series because of the fact that they are the only consistent outcrops. The flows in the mine area average about 30-50' thick and contain about 10 percent olivine, with labradorite, augite and a little magnetite making up the rest of the rock. They are usually greyish, fine-grained and are often vesicular. Vesicles range in size and sometimes are elongated in the direction of flow. Vesicularity is not a good criteria for matching flows. These flows often give a pretty good indication of structural trends. In practically all cases they are conformable with underlying tuffs and sediments. The exception to this along Thomas Creek where the capping basalt is flat and overlies dipping sediments.

The tuffs and tuffaceous sediments range from acid to basic, including welded tuffs or rhyolites to dark basaltic tuffs. In the mine area, the greater thickness is water-laid material. To the west, the greater thicknesses are of tuff and flows with a smaller percentage of sediments. To the west of Cottonwood Meadow on Howard Creek a thick section of sandstones is present. Also just west of the Dairy Creek Guard Station is a

thick massive sandstone ("Thick" means 100-200').

The sections along Thomas and Cottonwood Creeks, west of the mine area are composed of thick sections of tuffs. Usually the tuffs are iron-stained, sometimes porphyritic.

Most of them are loosely consolidated. The tuffs often carry small amounts of biotite and/or muscovite, feldspar phenocrysts; the groundmass consists of glass and feldspar.

The sediments are probably all tuffaceous, but some seem to have little directly contributed volcanic material. They range in size from f-g sands to agglomerates with angular fragments up to several inches across. There are two good sandstones (as mentioned before) on Howard Creek and near Dairy Creek Guard Station. These sediments range from fine sands to grits. Some of the rest of the sediments contain angular fragments and look like they might have been mudflows or similar beds. Well-rounded fragments are lacking as might be expected in an area with the great amount of uplift. Some of the very recent sediments bordering the east side of Summer Lake have large basalt boulders up to 2 feet in diameter.

Clay galls are common in the finer tuffaceous seds. These are usually smaller than $\frac{1}{2}$ inch in diameter.

As mentioned before these rocks, particularly the sediments, do not form outcrops. The best chances are in stream beds and sometimes in cliff faces. The ground underlain by these rocks will be covered with basalt float. However, I don't think it is far wrong to map basalt only when the outcrop is seen, ignore the basalt float, and call the rest tuff-seds.

Structure

Folding — In the mine area it appears as if a NW-SE trending fault

goes through the mine area. If this is a fold, it may have some bearing on the ore. It was formerly stated that all dips were the expression of faulting and that the dips were caused by the tilting of fault blocks. When that statement was made, the reversal of dips north of the mine area was not noted. The presence of this fold and others should be checked. Waring (1908, Water Supply Paper #220, U.S.G.S.) has plotted a long fold bearing about N. 30° W. passing through the mine area (approx.). This might be used as a starting point.

Faulting -- The faults are the most important structural feature of Lake County. There are several directions possibly correlated with different ages of faulting. Many "faults" are apparent on the areal photos of the area. It has been concluded that, in previous work the writer got a little carried away with plotting these faults. It is now thought that a lot more caution should be exercised in this method. However, it is also thought that the NE trending faults are essentially all valid. Some NW faults were put in where these lineations are simply the traces of the strike of flows and tuffs. Any such structure trending NW should be viewed with suspicion on areal photos. However, no evidence was found in the field to repudiate the NE trending faults. In fact, mapping of the mine area in detail, has shown that the same NE faults exist that are apparent on the areal photos (See photos CH2 26K-50 & 51). I think there are possibly more faults than show up on the photos.

Generally these faults are not of great magnitude. They probably h have a movement of 300 feet at the most. If the movement was horizontal, this distance could be slightly less. Dutro has stated that the faults in the mine area as determined by the drilling program have throws in

the order of 150 feet to 200 feet.

The two general directions of faulting appear to be vertical faults and seem to be fairly contemporaneous, or, at least no one direction seems to have stopped and another direction began. I would rather have all the faulting starting more or less contemporaneously and movement continuing in "fits and starts" over long periods of time. The large obvious faults on Abert Rim, etc., have probably been moving continuously and are probably moving now. Lake County, in spite of the sparse population, has several recent recorded earthquakes.

It is thought that the ore control at Lakeview is the faulting. Dutro said that one of the reasons for the presence of the mine at the White King is the concentration of small faults. This may well have been a contributing factor. It is fairly certain that the control should be mainly structural. The presence of a fold, with the crest at the mine, could be a factor.

White King and Surrounding Area

As noted before, an area between the White King and Lucky Lass was mapped in detail. Particular attention was paid to the basalt flows to see if some correlation between them could be made on petrographic evidence. Sampling of the flows could have been better. If possible, fresh samples from as near the same position in the flows should be obtained. With poor samples, some success was gained and it is thought that flows can be correlated over short distances. If extended for any distance, this could become very dangerous.

The NE trending faults have displaced the lava flows with the SE blocks moving down or NE. No NW faults were discovered. Petrographic evidence indicates the lava flows shown are not faulted and repeated down

$20,000,000

dip but are different flows. The NE faults have offset these flows across the strike and they are repeated in this manner.

As mentioned before, the basalts make up very little of the total rock volume. In the mine area, a guess of volumes would be 75 percent tuffs & seds., and 25 percent basalt. This basalt guess is probably too high.

The basalts are olivine rich, averaging about 5-10 percent, the rest labradorite and augite. Textures range from micro-porph. to sub-ophitic and inter-granular.

Dips of flows and seds. are all to the SW in the mine area.

The White King mine was first discovered in a hard opalized tuff bed. Above this is a clayey bed. It appeared as if the hard opalized layer was exposed to the air at one time. At least, a fragment of this banded rock appeared 3 feet above the rest of the outcrop in the clayey tuff in one of the cuts at the mine. It appeared as if a boulder had rolled off a high spot in the hard tuff into the overlying clayey tuff.

The problem of the opalized tuff should be worked out. Several outcrops, some extensive, of a very similar rock appear on the Thomas Creek road. These should be sampled and thin sections made to determine whether these rocks are all the same.

If the boulder is not misleading, this opalized rock may be part of a definite strata and is the same as the outcrops on Thomas Creek. It also could be directly associated with the mineralization of the mine. (Read the U.S.G.S. Report on the Opalite District, Malheur County.)

Dutro says that the ore is associated with opalization of tuffs, especially an agglomerate or breccia. This zone is faulted down to the N & E away from the main pit.

The ore minerals are probably novacekite and saleite, hydrous uranium magnesium arsenates and phosphates, respectively. Bray at the U. of O. did some X-ray diffraction work on the minerals at school and his results are inconclusive. However, he did say (see his letter) that the minerals were close to the structure of autunite and that they are probably novacekite and saleite. Also found near the surface is considerable mercury, and rare stibnite, realgar and orpiment and pyrite. Several specimens of a black "opal" that was very radioactive. No discreet particles other than opal could be discerned under the mike.

Recently, in drill holes, coffinite, a hydrous uranium silicate, has been discovered. (This ident by the A.E.C.) This mineral is associated with small cubes of galena and is a dense, black, sooty mineral. The "opal" just mentioned may have been solid coffinite which is described as looking like a high-rank coal. It is nearly opaque under the mike. In the samples collected near the surface, no lead was seen.

It is probable that the coffinite marks the unoxidized ore, but it will be interesting to see if the low T-P minerals which occur near the surface occur with the unoxidized uranium ore. they do

The Lucky Lass mine, a short distance to the NW of the White King is a filled (mineralized) shear zone in tuffs, flows (?) and sediments.

Agglomerates, welded tuffs and vesicular basalt boulders are mineralized. The basalt is probably dragged into the fault. Uranium mineralization is disseminated through porous rocks, lines vesicles, fractures and shears in other rocks.

STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Head Office: 1069 State Office Bldg., Portland 1, Oregon
Telephone: CApitol 6-2161, Ext. 488

Field Offices

2033 First Street
Baker

239 S.E."H"Street
Grants Pass

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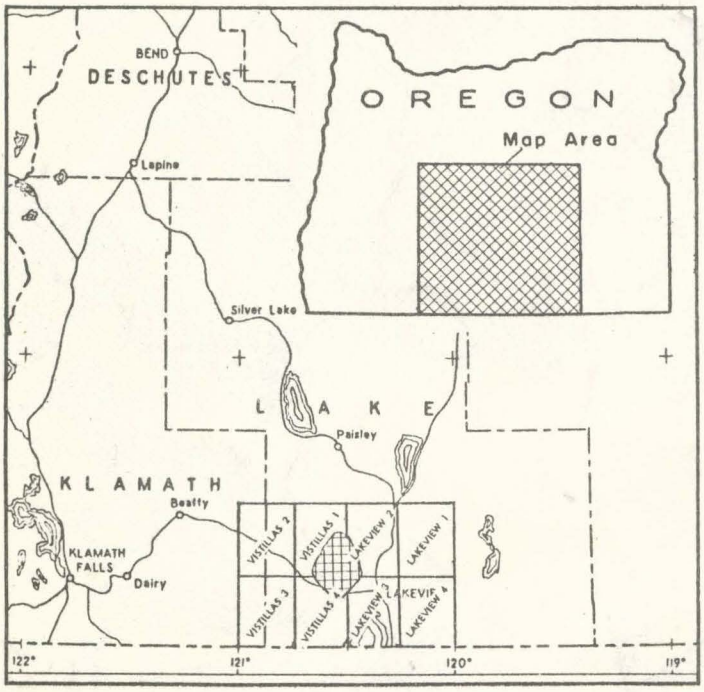
PRELIMINARY GEOLOGY OF THE LAKEVIEW URANIUM AREA, OREGON

By
Norman V. Peterson*

Introduction

This preliminary report is part of the Department's continuing uranium project intended both to enlighten and encourage the uranium prospector and to obtain basic stratigraphic information in areas of mineral significance that may lead to additional mineral discoveries. This basic information may also be used as needed to fill in gaps in the State Geologic Map.

The White King and the nearby Lucky Lass deposits of Lake County are the only economic occurrences of uranium so far discovered in Oregon. These deposits served as a starting point for the reconnaissance and semidetailed geologic mapping (see accompanying map) that was done during the summer field season of 1958. Mapping was begun in the vicinity of the uranium occurrences and extended in all directions to cover about 140 square miles.



Index Map showing location of area mapped.

Location

The Lakeview uranium area is in southwestern Lake County about 20 miles northwest of Lakeview. The area lies in the southern part of the Fremont Mountains just west of the northern edge of the Goose Lake Valley and within the Basin and Range physiographic province. Elevations vary from just over 5,000 feet above sea level at the base of the foothills northwest of Goose Lake to 7,925 feet at the top of Cougar Peak.

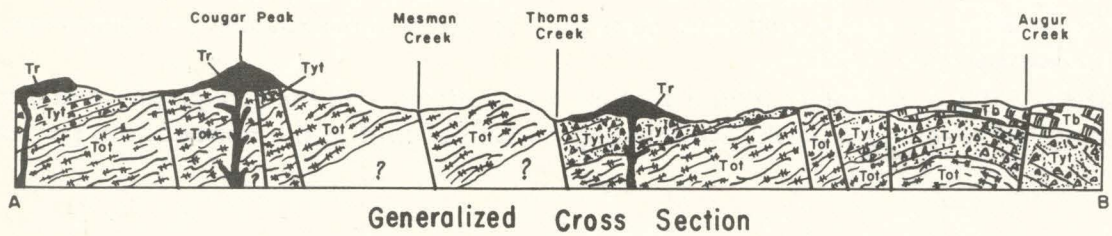
Northwest-trending fault-block ridges and their parallel streams that drain southeast into Goose Lake are typical of the topography in this part of the Fremont Mountains. Heavy soil cover and abundant timber are common throughout the area.

General geology

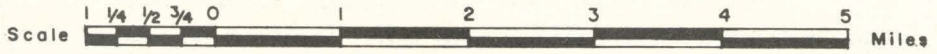
The general area is underlain by a great variety of volcanic rocks of Tertiary and Quaternary age. The oldest rocks are a series of indurated, light-colored, acid-to-intermediate tuffs, lapilli tuffs, and welded tuffs. For mapping purposes this series is called "Older tuffs."

These Older tuffs are overlain apparently conformably by another group of pyroclastic rocks mapped as "Younger tuffs" that are generally less indurated agglomerates, clayey tuffs, and a thick section of tuffaceous lake beds.

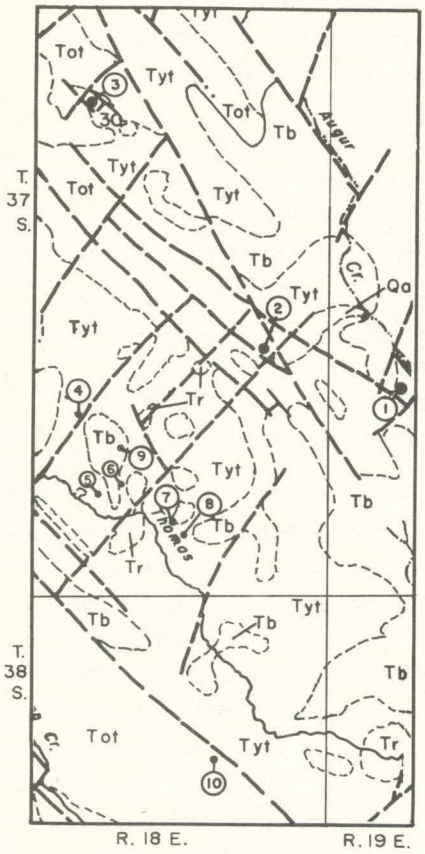
*Geologist, State of Oregon Department of Geology and Mineral Industries.



Generalized Cross Section



Feb. 1959



Section of Geologic Map Showing Radioactive Occurrences in the Vicinity of the White King Mine

1. White King
2. Lucky Lass
3. Marty K
4. Los Oros
5. Diamond Vee
6. Don Tracy Claims
7. Pie 1
8. Hammersley Claim
9. No Name
10. S & M #1

EXPLANATION

Quaternary
- Pleistocene & Recent — Qal — Alluvium

Tertiary
- Pliocene (?) — Tr — Glassy, flow-banded rhyolite
- Pliocene — Tb — Olivine basalt flows (Warner basalt)
- Pliocene — Ti — Basalt or gabbro dikes, sills, and necks
- Mio-Pliocene — Tyt — Younger tuffs (easily eroded clayey tuffs, lapilli tuffs, agglomerates, and tuffaceous lake beds)
- Miocene — Tot — Older tuffs (indurated acid tuffs, lapilli tuffs, and welded tuffs; minor tuffaceous sediments)

Dip and Strike 30

Fault

Contacts

Limit of Mapped Area

The Younger tuffs are in turn covered by a series of thin-to-thick olivine basalt flows (Warner basalt). The tuffs have been intruded by basalt dikes and sills that have a composition similar to the basalt flows.

The youngest rocks recognized in the area are light-gray glassy rhyolites that occur occasionally in dikelike masses and more commonly in conspicuous rounded to cone-shaped hills and elongate ridges.

Faulting is the dominant structural feature and controls both the topography and drainage. Field mapping has revealed a northwest-trending anticlinal fold in the northeastern part of the map area.

Stratigraphy

Older tuffs: The series of rocks that has been mapped as Older tuffs is at least 2,000 feet thick. It contains indurated light-colored acid tuffs, lapilli tuffs, welded tuffs, and a minor amount of dark red tuffaceous sedimentary beds. The color of the tuffs is variable but they are mainly tans, greens, and reddish browns. The Older tuffs occur in bold outcrops mainly in northwest-trending fault-block ridges. They are the most prominent rocks between Cottonwood Creek and Thomas Creek, and they form spectacular outcrops along U.S. Highway 66 in Antelope Canyon just west of the Goose Lake Valley.

In the lowest part of the Older tuffs there are about 250 feet of dark-red sedimentary beds. In these sedimentary beds a vertebrate tooth was found and later identified by Dr. J. Arnold Shotwell, of the University of Oregon, as being from a Diceratherium a rhinoceros of John Day age (lower Miocene). Several fossil leaves from the same fossil locality have been identified and compared to species in a flora that appears to be of Middle Miocene (Hemingfordian) age by Jack A. Wolfe of the University of California. Wolfe adds that an early or late Miocene age for these leaves would not be impossible.

Even though the lithology appears quite different this series may be correlative with a part of the Cedarville series as described by Russell (1928) in northeastern California.

Younger tuffs: The Younger tuffs are another group of highly variable pyroclastic rocks that appear to lie conformably on the Older tuffs. They are generally less indurated and consist of massive beds of clayey tuff, pumiceous lapilli tuff, agglomerates, and a thick section of thin-to-thick-bedded lacustrine sediments. The thickness of this group of tuffs is variable. As much as 1,000 feet have been measured in one section near the head of Howard Creek in the southwestern part of the mapped area. The rocks in this group are very easily eroded and usually do not form conspicuous outcrops. They are the predominant rocks northeast of Thomas Creek and underlie a large area in the vicinity of Cox Flat the largest upland meadow in the area. Along Howard Creek and to the northwest of the mapped area the lake bed section is exposed in sharp cliffs as much as 100 feet high. Fossil leaves were collected from several localities within the Younger tuffs and the one species identified is known elsewhere from late Miocene and earliest Pliocene. There is the possibility that this sequence may also correlate with the uppermost Cedarville series of Russell (1928), or with the Alturas formation in northeastern California described by Dorf (1930), and later by La Motte (1936), as having a Pliocene florule and a lower to middle Pliocene vertebrate fauna. Newcomb (1958) has recently described similar pyroclastic rocks as the Yonna formation of middle Pliocene age to the west in the Klamath Basin. No positive correlation of the Younger tuffs is proposed at this time.

Olivine basalt flows (Warner basalt): In the series of thin-to-thick olivine basalt flows that have been mapped as Warner basalt there are two distinct textural types. These textures appear to represent two periods of closely related volcanic activity. The lowermost flows are black porphyritic lavas with occasional large phenocrysts of feldspar (1 by 1-inch crystals are common) in a dense groundmass. The upper and most predominant flows are the typical light-

gray open-textured "diktytaxitic" variety of olivine basalt. Both types of basalt are highly fractured, show rough columnar jointing, and at tops and bottoms are highly vesicular. The total thickness of the basalt is variable from a few thin flows a few feet thick to many flows as much as 800 feet thick. Massive exposures of basalt are found east of Augur Creek and in the Camp Creek burn area. Residual fragments of basalt often form a thin layer on the Younger tuffs so that in most cases float cannot be used to map the underlying rocks.

The basalt appears to overlie the Younger tuffs conformably except in a few cases where the contact resembles an old erosion surface. Its stratigraphic position makes a correlation with the Warner basalt of Pliocene age plausible.

Basalt and gabbro dikes: Occasional dense to coarse-grained olivine basalt and olivine gabbro dikes and sills cut the Older tuff and Younger tuff sequences. Their composition is similar to the basalt and they are probably the source of the flows. The dikes range in size from 6 inches thick to more than 100 feet thick and some, like the prominent gabbro dike just north of Fish Lake in the southern part of the area, can be traced for more than a mile.

Rhyolite: The youngest Tertiary rocks recognized in the area are white to light-gray glassy flow-banded rhyolites that occur occasionally in dikelike masses and more commonly in conspicuous rounded to cone-shaped hills and domes. The domes appear to be accumulations of blocks and fragments of platy flow-banded rhyolite and are believed to be similar to the cumulo-domes described by Cotton (1952). Cotton describes them as being acid lavas extruded in such a highly viscid condition that they will not flow. They disintegrate explosively and while still hot are buried in debris. The highest peak in the area, Cougar Peak, is an excellent example of this type. It is a cone-shaped peak made up of rhyolitic rubble and is perched on a fault-block ridge of Older tuff. A cluster of smaller domes can be seen just north of Cox Flat.

The rhyolites appear to be in part intrusive and in part extrusive. They generally contain bands and irregular masses of white ashy material and, in most cases, intricate flow banding is highly developed. Perlite is well developed at the edges of many of the exposures and locally the rhyolite is partially to completely opalized. The age of the rhyolite is not known except that it is post-Warner basalt. The very slight erosional effects on the domes give them the appearance of being very young features and they may be of Pleistocene or even Recent age.

Structure

Waring (1908) suggested a major anticline extending from Silver Lake southward through the Goose Lake Valley. In the course of the present field work, the axis of an anticlinal fold trending about N. 35° W. to N. 45° W. was found just east of Augur Creek in the northeast part of the map area. Dips on the limbs of the fold range from 15° to 40° to the southwest and northeast.

Faulting is the dominant structural feature, in fact the whole area has been intricately faulted. The topography and drainage are controlled by prominent fault sets in three directions: N. 45° W., N. 45° E., and N. 15° E. The faults appear to be high-angle normal faults showing rather small displacements ranging from a few tens to a few hundred feet. There are at least two exceptions, however: the fault zone paralleling Mesman Creek where at least 2,000 feet of the Older tuff sequence is repeated, and again along Thomas Creek where 2,000 feet of Older tuffs are exposed in the upthrown block and the top of the Younger tuff is exposed on the northeast or downthrown side. The faulting does not appear to be of different ages, that is, one direction does not appear to consistently truncate another direction. Movements along the faults probably began contemporaneously in late Tertiary time and have probably continued sporadically up to the present.

Mineral deposits

Preliminary reports on the mineralogy and origin of the White King and Lucky Lass deposits by Schafer (1955, 1956) and Peterson (1958) show that the uranium was probably introduced into agglomerate and tuff beds of the Younger tuff unit along numerous fault and shear zones as a late phase of volcanic activity. Black uranium oxides (uraninite, sooty pitchblende, coffinite(?)) and associated realgar, stibnite, pyrite, cinnabar, molybdenum sulfides, galena, and chalcedony indicate a hydrothermal origin at relatively low temperature and pressure. Opalization and clay alteration are also prominent in the ore bodies especially in the vicinity of faults. The presence of the porous agglomerate bed with the large number of small faults probably accounts for the localized mineralization at the White King mine. Movement on the numerous faults occurred both before and after the uranium was emplaced,and ore bodies are offset by the later movement.

Although the age of mineralization has not been determined, bleaching and alteration of the Pliocene flow basalt near the White King mine and the occurrence of secondary minerals in vesicles of the basalt at the Lucky Lass deposit show that the mineralization is post basalt. The direct association with the younger rhyolite intrusive rocks makes a late Pliocene or younger age for the mineralization possible.

From a study of the White King deposit there are several structural, lithologic, and mineralogic guides that may be used to indicate a favorable location for uranium mineralization:

1. Areas in which there are intersections of fault zones or a concentration of faults or shear zones.

2. The presence of near-surface intrusive bodies of rhyolite or acid rocks and especially the contact between the glassy flow-banded rhyolite and the Younger tuff unit.

3. Silicified and opalized zones within the rhyolite or Younger tuff unit.

4. Bleached or heavily iron-stained rock outcrops should be checked for evidence of metallic minerals such as pyrite, cinnabar, or secondary uranium minerals.

After determining favorable geological locations there are many geochemical prospecting methods such as soil sampling and testing of ground water or surface stream waters that may lead to the discovery of concealed deposits.

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GEOLOGY CONFERENCE TO BE HELD AT OREGON STATE COLLEGE

Oregon State College has been singled out by the National Science Foundation to conduct the 1959 Summer Conference in Geology for College Teachers. This conference is one of 19 to be sponsored this summer by the Foundation. Other conferences will cover the fields of biology, chemistry, engineering, mathematics, physics, and psychology, and will be held at various institutions in the United States.

The geology conference will be held from June 15 through June 27, 1959, on the campus of Oregon State College. It will consist of one week of lectures and discussions followed by two field trips. The topic selected for the conference is "Stratigraphy and structural development of the Mesozoic of the Pacific Coast with particular reference to the problems of the Pacific Northwest." Noted specialists in Mesozoic geology will be on the conference staff. The following program is planned:

June 15 - Triassic - Dr. Siemon Muller, Stanford University

June 16 - Jurassic - Dr. Ralph Imlay, U. S. Geological Survey

June 17 - Cretaceous - Dr. David Jones, U. S. Geological Survey
Dr. E. L. Packard, Oregon State College (Emeritus)

June 18-19 - Structural development - Dr. A. J. Eardley, University of Utah

June 20-22 - Regional Correlation - Dr. H. E. Wheeler, University of Washington

Field trips: June 21 - Oregon Coast - Oregon State College staff

June 23-27 - Central Oregon and Columbia River Gorge

W. D. Wilkinson - Oregon State College
T. P. Thayer - U. S. Geological Survey
Ralph Imlay - U. S. Geological Survey
J. E. Allen - Portland State College

Professor W. D. Wilkinson, who was responsible for securing the grant from the National Science Foundation to conduct the conference, will be in charge. Those interested in participating in the program may obtain information and application forms from Dr. Wilkinson, Geology Department, Oregon State College, Corvallis, Oregon. Applications should be submitted as promptly as possible. Only those applicants actively engaged in teaching undergraduate college geology who have had at least three years of experience will be considered. Most of the participants will have Ph.D. degrees, although some applicants having Masters' Degrees will be chosen if they are otherwise qualified. Selection of thirty college teachers will be made.

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U.S. BUREAU OF MINES CONTINUES OUTSTANDING NEW DEVELOPMENTS

The recent announcements by the U.S. Bureau of Mines Electrodevelopment Laboratory at Albany, Oregon, of the production of ductile yttrium metal and the shape-casting of molybdenum marks two more important achievements by its staff members. These metallurgical triumphs climax 15 years of dedicated research which has gone practically unnoticed by the general public.

The Laboratory was established in 1944 on the campus of the old Albany College, and here the Bureau assembled a topnotch staff of scientists, technicians, and engineers. Today this Laboratory is recognized throughout the world as a leading metallurgical research center. Originally the facility was to develop new uses for Northwest electric power through the beneficiation of the area's raw mineral materials. In the ensuing years the scope of activities has expanded far beyond this concept and it is now engaged in not only studying processes for upgrading ores and metals but in conducting pilot-plant operations designed to smooth the difficult transition from test tube to full-scale private commercial operation. The Bureau's Laboratory does a lot of "pure" research but it should not be called an "ivory tower."

Ductile yttrium metal was long considered an impossibility, as the metal formerly produced was brittle and could not be formed. The Bureau succeeded in developing special metallurgical techniques which enabled it to produce a tissue-thin yttrium foil.

The other Bureau "first" recently announced is the shape-casting of molybdenum. Molybdenum has a high melting point and for this reason has resisted being cast in conventional molds. The Bureau solved the problem with a water-cooled copper crucible and special procedures. The missile program uses molybdenum to combat extremely high temperatures developed in exhaust systems. The new availability of cast shapes will make fabrication much simpler since pieces will not have to be machined "out of the solid."

The production of ductile zirconium, using a process perfected by Dr. W.J. Kroll, was one of the first major developments at Albany. The Kroll process was the basis for the successful processing of ductile yttrium. Zirconium and yttrium are called "reactive metals" as they are useful in atomic reactors because of special nuclear properties. Pure hafnium, another reactive metal, was first prepared by the Bureau, which also perfected a process by which columbium and tantalum could be separated economically and in sufficient volume to make the metals commercially useful. The Bureau at Albany is still the world's only source of high-purity, ductile chromium which is drawn into fine wire, made radioactive, and used in cancer research.

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DEFINITION OF "COMMON VARIETIES" IS AMPLIFIED

In a letter to Senator James E. Murray, the Bureau of Land Management's definition of "common variety" materials as provided under Public Law 167 was amplified by Earl J. Thomas, acting director.

According to Thomas, the department believes that a "common variety" of material is one that has no special physical or chemical properties which differentiate it from other deposits of such material so as to give it a special or distinct value. By stressing the chemical or physical properties of the material itself, he said, the department has attempted to differentiate from geographical location as it is of the opinion that location alone would not be a determining factor as to whether a material is a "common variety" or not.

"Under our definition of the term," Thomas continued, "limestone, quartzite, or other material valuable for metallurgy, limestone suitable for cement making, stone suitable for cutting into blocks or naturally cleavable into slabs suitable for building, or silica sand suitable for glass manufacture or foundry use, for example, would not be a 'common variety.' Such materials would remain subject to location under the mining laws upon a valid discovery and would, as in the past, be subject to patent upon proper application."

The "common varieties" of sand, stone, gravel, pumice, pumicite, cinders, clay, etc., may be acquired only under terms of the Materials Disposal Act. Since enactment of Public Law 167 on July 23, 1955, these materials are no longer considered "valuable mineral deposits" within the meaning of the mining laws, and thus no longer subject to such locations.

In Circular No. 1961, giving general mining regulations and rights acquired by location pursuant to Public Law 167, the Department of Interior has stated:

> "Common varieties as defined by decision of the department and of the courts include deposits which, although they may have value for use in trade, manufacture, the sciences, or in the mechanical or ornamental arts do not possess a distinct, special economic value for such use over and above the normal uses of the general run of such deposits." (From Pay Dirt, December 19, 1958.)

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GEOLOGY CONFERENCE TO BE HELD AT OREGON STATE COLLEGE

Oregon State College has been singled out by the National Science Foundation to conduct the 1959 Summer Conference in Geology for College Teachers. This conference is one of 19 to be sponsored this summer by the Foundation. Other conferences will cover the fields of biology, chemistry, engineering, mathematics, physics, and psychology, and will be held at various institutions in the United States.

The geology conference will be held from June 15 through June 27, 1959, on the campus of Oregon State College. It will consist of one week of lectures and discussions followed by two field trips. The topic selected for the conference is "Stratigraphy and structural development of the Mesozoic of the Pacific Coast with particular reference to the problems of the Pacific Northwest." Noted specialists in Mesozoic geology will be on the conference staff. The following program is planned:

June 15 - Triassic - Dr. Siemon Muller, Stanford University

June 16 - Jurassic - Dr. Ralph Imlay, U. S. Geological Survey

June 17 - Cretaceous - Dr. David Jones, U. S. Geological Survey
Dr. E. L. Packard, Oregon State College (Emeritus)

June 18-19 - Structural development - Dr. A. J. Eardley, University of Utah

June 20-22 - Regional Correlation - Dr. H. E. Wheeler, University of Washington

Field trips: June 21 - Oregon Coast - Oregon State College staff

June 23-27 - Central Oregon and Columbia River Gorge

W. D. Wilkinson - Oregon State College
T. P. Thayer - U. S. Geological Survey
Ralph Imlay - U. S. Geological Survey
J. E. Allen - Portland State College

Professor W. D. Wilkinson, who was responsible for securing the grant from the National Science Foundation to conduct the conference, will be in charge. Those interested in participating in the program may obtain information and application forms from Dr. Wilkinson, Geology Department, Oregon State College, Corvallis, Oregon. Applications should be submitted as promptly as possible. Only those applicants actively engaged in teaching undergraduate college geology who have had at least three years of experience will be considered. Most of the participants will have Ph.D. degrees, although some applicants having Masters' Degrees will be chosen if they are otherwise qualified. Selection of thirty college teachers will be made.

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U.S. BUREAU OF MINES CONTINUES OUTSTANDING NEW DEVELOPMENTS

The recent announcements by the U.S. Bureau of Mines Electrodevelopment Laboratory at Albany, Oregon, of the production of ductile yttrium metal and the shape-casting of molybdenum marks two more important achievements by its staff members. These metallurgical triumphs climax 15 years of dedicated research which has gone practically unnoticed by the general public.

The Laboratory was established in 1944 on the campus of the old Albany College, and here the Bureau assembled a topnotch staff of scientists, technicians, and engineers. Today this Laboratory is recognized throughout the world as a leading metallurgical research center. Originally the facility was to develop new uses for Northwest electric power through the beneficiation of the area's raw mineral materials. In the ensuing years the scope of activities has expanded far beyond this concept and it is now engaged in not only studying processes for upgrading ores and metals but in conducting pilot-plant operations designed to smooth the difficult transition from test tube to full-scale private commercial operation. The Bureau's Laboratory does a lot of "pure" research but it should not be called an "ivory tower."

LEGISLATIVE COMMITTEES

In January 1959 the Eighty-sixth Congress of the United States and the Fiftieth Legislative Assembly of the State of Oregon convened. It is expected that both bodies will enact laws affecting the mining industry. For convenience a memorandum of both Federal and State Senate and House committees that would deal with mining legislation is listed below:

Congressional Committees

Senate Interior and Insular Affairs Committee

Murray (Mont.), Chairman; Anderson (N.M.); Jackson (Wash.); O'Mahoney (Wyo.); Bible (Nev.); Neuberger (Ore.); Carroll (Colo.); Church (Idaho); Gruening (Alaska); Moss (Utah); Dworshak (Idaho); Kuchel (Calif.); Goldwater (Ariz.); Allott (Colo.); and Martin (Iowa).

House Interior and Insular Affairs Committee

Aspinall (Colo.), Chairman; O'Brien (N.Y.); Rogers (Tex.); Pfost (Idaho); Haley (Fla.); Powell (N.Y.), Chairman, Mines and Mining Subcommittee; Edmondson (Okla.); Christopher (Mo.); Sisk (Calif.); Udall (Ariz.); Rutherford (Tex.); Baring (Nev.); Ullman (Ore.); Anderson (Mont.); Saund (Calif.); McGinley (Neb.); Morris (N.M.); Rivers (Alaska); Burdick (N.D.); Saylor (Pa.); Wharton (N.Y.); Berry (S.D.); Westland (Wash.); Hosmer (Calif.); Chenoweth (Colo.); Collier (Ill.); Withrow (Wis.); Wilson (Calif.); Cunningham (Neb.); Langen (Minn.); and Simpson (Ill.).

Senate Interstate and Foreign Commerce Committee

Magnuson (Wash.), Chairman; Pastore (R.I.); Monroney (Okla.); Smathers (Fla.); Thurmond (S.C.); Lausche (Ohio); Yarborough (Tex.); Engle (Calif.); Bartlett (Alaska); Hartke (Ind.); McGee (Wyo.); Schoeppel (Kan.); Butler (Md.); Cotton (N.H.); Case (N.J.); Morton (Ky.); and Scott (Pa.).

House Interstate and Foreign Commerce Committee

Harris (Ark.), Chairman; Williams (Miss.); Mack (Ill.); Roberts (Ala.); Moulder (Mo.); Staggers (W.Va); Dollinger (N.Y.); Rogers (Tex.); Friedel (Md.); Flynt (Ga.); Macdonald (Mass.); Rhodes (Pa.); Jarman (Okla.); O'Brien (N.Y.); Moss (Calif.); Dingell (Mich.); Kilgore (Tex.); Rogers (Fla.); Hemphill (S.C.); Rostenkowski (Ill.); Brock (Neb.); Bennett (Mich.); Springer (Ill.); Bush (Pa.); Schenck (Ohio); Derounian (N.Y.); Younger (Calif.); Avery (Kan.); Collier (Ill.); Glenn (N.J.); Devine (Ohio); Nelson (Minn.); and Keith (Mass.).

State Legislative Committees

Senate Natural Resources Committee

Naterlin (Tillamook, Lincoln), Chairman; Thiel (Clatsop, Columbia), Vice-Chairman; Cameron (Josephine); Hopkins (Union, Wallowa, Baker); Key (Umatilla); Leth (Polk); and Ziegler (Benton).

Senate Ways and Means Committee

Alfred Corbett (Multnomah), Chairman; Cook (Multnomah), Vice-Chairman; Durno (Jackson); Key (Umatilla); Lewis (Multnomah); Thiel (Clatsop, Columbia); and Ziegler (Benton).

House Forestry and Mining Committee

Monaghan (Clackamas), Chairman; Christopher (Multnomah), Vice-Chairman; Back (Coos, Curry); Bristol (Josephine); Fisher (Lane); Flegel (Douglas); Haight (Baker); Hoyt (Benton); and Metke (Deschutes).

House Planning and Development Committee

Benedict (Multnomah), Chairman; Turner (Columbia), Vice-Chairman; Goss (Multnomah); Heider (Marion); Kelsay (Douglas); Orr (Clackamas); and Chadwick (Marion).

House Ways and Means Committee

Skelton (Lane), Chairman; Annala (Hood River), Vice-Chairman; Barton (Coos); Cady (Grant, Harney, Lake); Chadwick (Marion); Davis (Washington); and Hansell (Umatilla).

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THREE NEW LAND WITHDRAWALS

The Portland office of the U.S. Bureau of Land Management has notified the Department that three applications for withdrawal of land in Oregon were made in February. Total land embraced in the three withdrawals is a little more than 4,000 acres. Applications have been submitted to the Bureau of Land Management by the U.S. Bureau of Reclamation, U.S. Department of Agriculture (Forest Service), and the U.S. Bureau of Sport Fisheries and Wildlife. All withdrawals are subject to valid existing rights and all would prevent location of mining claims under the general mining laws. General location and bureaus requesting withdrawals are as follows:

U.S. Bureau of Reclamation - proposes to use land for reclamation purposes in the proposed development of the Lower Grande Ronde and Catherine Creek areas of the Grande Ronde Project.

T. 2 S., R. 36 E., part of sec. 34.
T. 3 S., R. 36 E., parts of secs. 2, 3, 4, 8, 9, 10, 11, 15, 16, 17, 20, and 30.
T. 5 S., R. 41 E., part of sec. 7.
Approximately 3,917 acres.

U.S. Department of Agriculture - desires use of land for the Sunshine Bar Recreation Area.
T. 33 S., R. 14 W., part of sec. 13.
Approximately 55 acres.

U.S. Bureau of Sport Fisheries and Wildlife - desires the land for use by the Oregon State Game Commission for the purpose of developing and providing public access to the Wallowa River for fishing in connection with the Wallowa River Wildlife Management Area.
T. 2 N., R. 41 E., parts of secs. 19, 20, and 30.
Approximately 140 acres.

All persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawals have 30 days in which to present their views in writing to the State Supervisor, Bureau of Land Management, 809 N.E. 6th Avenue, Portland 12, Oregon.

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STONE CUTTING AND POLISHING DESCRIBED

"Stone Cutting and Polishing," by Oliver Bowles, has been issued by the U.S. Bureau of Mines as Information Circular 7863. The 26-page publication describes techniques and equipment for cutting and polishing stones for architectural, memorial, jewelry, and other varied uses. It contains photographs and a bibliography on cutting and polishing stones and gems. The publication is available only from the Superintendent of Documents, Washington 25, D.C., at 25 cents a copy.

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CENTURY OF OIL INDUSTRY DESCRIBED

The 100-year history of the petroleum industry is presented in a magnificent issue of The Oil and Gas Journal entitled "Petroleum Panorama." This commemorative number (vol.57, no. 5, Jan. 28, 1959) traces the development of exploration, drilling, production, transportation, and refining from earliest days to the present. It contains hundreds of illustrations, many of which are published for the first time. "Petroleum Panorama" may be obtained from The Oil and Gas Journal, Box 1260, Tulsa 1, Oklahoma. The price is $2.50.

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Page 66 Wasatch Range Utah

Gilbert, G.K., 1928, Studies of Basin-Range Structure USGS PP 153 –

A. the range is a structural ridge, uplifted between 2 faults

1. Western or frontal fault is the larger

It is determined as a fault by structural and physiographic evidence.

Structural evidence

friction products

fault gauge, breccias, horses, and slickensides.

Physiographic evidence includes:

an escarpment, with aligned base and aligned facets, which truncates the sculpture and antecedent structure of the range and which is bordered by a broad alluvial plain, and piedmont scarps.

The ground plan of the fault is neither straight nor approximately straight but includes noticeable flexures and some angular turns.

Average dip of the fault is 34° and the direction of slip was with the dip. A conservative estimate of the throw is 10,000 feet in some places.

The east side fault was determined wholly from physiographic features, escarpment, valley aggradation, etc.

In the northern 1/3 of the range the eastern fault is characterized by large grabens, and the dropped blocks are themselves broken by cross faults. The

367

Before the range arose its site – or at least a part of its site – was a tract of land of low relief, as is shown by remnants and other vestiges of a peneplain. ~~The records~~ ... These imperfectly compiled data, although they fail to fix the date of birth of the range, serve to show that the period of diastrophism to which its growth belongs is distinct from the period of the great post-Jurassic revolution being separated by the period of quiet in which the peneplain was developed. The period of the peneplain which immediately preceded the birth of the range, may have coincided with that of Eocene deposition a few miles farther east or it may have followed not only Eocene deposition but the dislocation of the Eocene strata.

After the range had achieved the greater part of its growth

MEMORANDUM:

The following article from April 1963 E & M J p. 106 should spike rumors that the Vitro Corporation, Salt Lake City Uranium Mill will be shut down in the near future:

VITRO CONVERTS S L C PLANT TO VANADIUM

Initial production of vanadium pentoxide, ammonium metavanadate and other vanadium compounds is due this spring from Vitro Corp.'s former exclusively uranium-producing plant in Salt Lake City, according to William B. Hall, president of Vitro Chemical Co.

Ultimate vanadium capacity of the Salt Lake mill could be plus-3-million lb of oxides and products, if no uranium were produced at all. Uranium capacity (ore input) is 800 tpd.

The vanadium operations will be alternated in the plant with uranium ore processing--a step which "will permit the processing of more uranium ore at Salt Lake City over a longer period of time than would otherwise be possible."

Vitro is at present negotiating an extension of its uranium contract with the AEC to December 1966, under an earlier agreement.

Raw material for the vanadium operation will be vanadium-containing ferro-phosphorus, produced as a by-product by FMC Corp. at its Pocatello, Idaho, phosphate plant. Vitro, according to Hall, has developed a process to directly handle raw ferrophosphorus via a salt roasting and solvent extraction technique without prior concentration. A "washing-out" of parts of the process line permits the switch from U_3O_8 to V_2O_5 and back.

Pilot plant studies on beryllium processing have been conducted at the plant in recent years, and a Vitro spokesman conceded the ultimate possibility that, should market conditions demand, the two-product facility might add that third commodity to its flowsheet.

Kermac Nuclear Fuels will also be making vanadium pentoxide from ferro-phosphorus slab wastes by late spring or early summer. Kermac is building a plant near Soda Springs, Idaho, and will get its ferrophosphorus from nearby Central Farmers Fertilizers Co. and Monsanto Chemical Co.

p 1208 Anderson, E.M. The Dynamics of Faulting

Wrench fault - dominant relative motion of one block to the other is horizontal and the fault planes essentially vertical.

Is synonomous with strike-slip fault and "transcurrent fault".

Wrench fault is interchangeable with lateral fault where that expression means actual rather than apparent relative movement. Right lateral and left lateral refer to the apparent movement of the two blocks viewed in plan; right lateral indicate clockwise and left lateral " counterclockwise separation.

p 1208 ..... large-scale wrench faults may be a dominant type of failure in the earth's crust. Large areas, probably continental in dimensions, appear to have been subjected to rather uniform stresses for extended periods

Left Lateral

Right Lateral

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M029034
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... L6
- MAP CODE NO. OF REC..

REPORTER
- NAME..... WALKER, GEORGE W.
- DATE..... 78 01

NAME AND LOCATION

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COLEMAN POINT

LATITUDE	LONGITUDE
42-28-30N	120-39-30W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4704959.8	692492.4	+10

- TWP..... 036S
- RANGE.... 017E
- SECTION.. 01
- MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... U HG

ANALYTICAL DATA(GENERAL)
- 0.10 - EU; 0.1 - U

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 1
- PRESENT/LAST OWNER..... LEWIS A. KOEHN

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M029029
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
DEPOSIT NO..... L1
MAP CODE NO. OF REC..

REPORTER
NAME..... WALKER, GEORGE W.
DATE..... 78 01

NAME AND LOCATION
DEPOSIT NAME..... WHITE KING MINE

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-20-00N	120-31-15W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4689549.8	704255.3	+10

TWP..... 037S
RANGE.... 019E
SECTION.. 30
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT..... U AS HG SB MO

ORE MATERIALS (MINERALS,ROCKS,ETC.):
URANINITE, AUTUNITE, HEINRICHITE, COFFINITE, TORBERNITE, ABERNATHYITE, URANOSPINITE, NOVACEKITO

ANALYTICAL DATA(GENERAL)
LESS THAN 0.1 TO MORE THAN 0.7 - U

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
VEIN-DISSEMINATION

PRODUCTION
YES
MEDIUM PRODUCTION

GEOLOGY AND MINERALOGY
HOST ROCK TYPES..... OPALIZED RHYOLITE AND TUFF

GENERAL REFERENCES
1) COHENOUR, 1960 , GEOL. AND URAN. OCCURRENCES.... USAEC RME-2070
2) MATTHEW, T.C., 1955 , OREGON RADIO. DISC.: ORE BIN

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... FS00032
RECORD TYPE..... XIN
COUNTRY/ORGANIZATION. USGS
FILE LINK ID..... FSR06 - 00033
MAP CODE NO. OF REC..

REPORTER
NAME..... SIERK, BETTY M.
DATE..... 75 09

NAME AND LOCATION
DEPOSIT NAME..... SPRING CREEK GROUP

MINING DISTRICT/AREA/SUBDIST. ON WINEMA NF

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE
NAME OF FOREST..... WINEMA
DRAINAGE AREA..... 17
PHYSIOGRAPHIC PROV..... 13

LATITUDE	LONGITUDE
42-40-	121-52-

UTM NORTHING	UTM EASTING	UTM ZONE NO
4724207.8	592877.0	+10

TWP..... 033S
RANGE.... 008E
SECTION.. 32 33 34
MERIDIAN. WM

COMMODITY INFORMATION
COMMODITIES PRESENT..... DIT

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.....
OCCURRENCE..... DIT

EXPLORATION AND DEVELOPMENT

YEAR WORK TYPE ORGANIZATION AND RESULTS
1) 1966 COMPILE FS, GEOLOGIC INTERPRETATION

PRODUCTION
NO PRODUCTION

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... PLIO
HOST ROCK TYPES..... PEAT, SAND, DIATOMITE

AGE OF ASSOC. IGNEOUS ROCKS.. PLIO

AGE OF MINERALIZATION..... PLEIS

PERTINENT MINERALOGY..... BASALT, PUMICE

GEOLOGY (SUPPLEMENTARY INFORMATION)
REGIONAL GEOLOGY
MAJOR REGIONAL STRUCTURES.. YEARS FAULT PLANES

LOCAL GEOLOGY

SIGNIFICANT LOCAL STRUCTURES:
CRATER LAKE

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M020347
RECORD TYPE..... X1M
INFORMATION SOURCE... 12
MAP CODE NO. OF REC..

REPORTER
NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
AFFILIATION..... DOGMI
DATE..... 81 03

NAME AND LOCATION
DEPOSIT NAME..... RYAN GROUP

MINING DISTRICT/AREA/SUBDIST. GLASS BUTTES

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE
DRAINAGE AREA..... 17070303 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV..... 10 HIGH LAVA PLAINS
LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 250000	BURNS

LATITUDE	LONGITUDE
43-32-14N	119-57-02W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4824500	261600	+11

TWP..... 023S
RANGE.... 023E
SECTION.. 34

ACCURACY OF LOCATION
ACCURATE

POSITION FROM NEAREST PROMINENT LOCALITY: 50 MILES WEST OF BURNS; 3 MILES SOUTH OF HIWAY 20

COMMODITY INFORMATION

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CINNABAR

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 8
YEAR OF DISCOVERY..... 1933
BY WHOM..... P.L. FORBES
YEAR OF FIRST PRODUCTION. 1967
YEAR OF LAST PRODUCTION. 1968
PRESENT/LAST OWNER..... VERN RYAN
PRESENT/LAST OPERATOR.... JACKSON MOUNTAIN MINING CO., 1968

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MINERALIZED FRACTURE ZONE; OPALITE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
COMMENTS(DESCRIPTION OF DEPOSIT):
2 SMALL OREBODIES ABOUT 1/4 MILE APART

DESCRIPTION OF WORKINGS
SURFACE

COMMENTS(DESCRIP. OF WORKINGS):
2 SMALL OPEN PIT AREAS

PRODUCTION
YES
SMALL PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 HG	ACC	0000.368	FL	1967-1968	ORE AVERAGED 0.6 LB. HG/TON

SOURCE OF INFORMATION (PRODUCTION).. COMPANY RECORDS VIA H.C. BROOKS, ODGMI

PRODUCTION COMMENTS.... MILL CUTOFF GRADE WAS 0.5 LB HG/TON

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... MIO
HOST ROCK TYPES..... OPALITE DERIVED FROM GLASSY SILICIC LAVA AND TUFF

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054989
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 76 08

NAME AND LOCATION
DEPOSIT NAME..... ROSALITE

MINING DISTRICT/AREA/SUBDIST. QUARTZ MOUNTAIN

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COUGAR PEAK

LATITUDE	LONGITUDE
42-18-00N	120-43-52W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4685380.0	687030.0	+10

TWP..... 038S
RANGE.... 017E
SECTION.. 05
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED ON MINE SYMBOL

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

ORE MATERIALS (MINERALS,ROCKS,ETC.):
IRON OXIDE

MAIN ORE MINERALS:

EXPLORATION AND DEVELOPMENT

STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE

YEAR OF DISCOVERY..... 1957

BY WHOM..... PRESENT OWNERS

PRESENT/LAST OWNER..... E. H. ROSBOROUGH, WAYNE NEIHAUS, H. C. SMITH, 1963

DESCRIPTION OF DEPOSIT

FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA

SIZE OF DEPOSIT..... SMALL

DESCRIPTION OF WORKINGS

SURFACE

PRODUCTION

NO PRODUCTION

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... TERT

HOST ROCK TYPES..... TUFF

GEOLOGICAL DESCRIPTIVE NOTES. FE - OXIDE MAY HAVE BEEN MISTAKEN FOR CINNABAR

GENERAL REFERENCES

1) BROOKS, H. C., 1963, QUICKSILVER IN OREGON: OREGON DEPT. OF GEOLOGY AND MINERAL INDUSTRIES, BULL. 55, 223 P.

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M020346
RECORD TYPE..... X1M
INFORMATION SOURCE... 12
MAP CODE NO. OF REC..

REPORTER
NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
AFFILIATION..... ODGMI
DATE..... 81 03

NAME AND LOCATION
DEPOSIT NAME..... POLARIS

MINING DISTRICT/AREA/SUBDIST. GLASS BUTTES

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE
DRAINAGE AREA..... 17070303 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV..... 10 HIGH LAVA PLAINS
LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 250000	BURNS

LATITUDE	LONGITUDE
43-31-59N	119-56-30W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4824000	262000	+11

TWP..... 023S
RANGE.... 023E
SECTION.. 34

ACCURACY OF LOCATION
ACCURATE

POSITION FROM NEAREST PROMINENT LOCALITY: 50 MILES WEST OF BURNS; 3 MILES SOUTH OF HIWAY 20

COMMODITY INFORMATION

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CINNABAR

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. B
YEAR OF DISCOVERY..... 1933
BY WHOM..... P.L. FORBES
YEAR OF FIRST PRODUCTION. 1956
YEAR OF LAST PRODUCTION. 1970
PRESENT/LAST OWNER..... ASA GODDARD

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MINERALIZED FRACTURE ZONE, OPALITE
FORM/SHAPE OF DEPOSIT: TABULAR

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
STRIKE OF OREBODY.... NW
DIP OF OREBODY..... STEEP NE

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND
DEPTH OF WORKINGS BELOW SURFACE. 100 FT
LENGTH OF WORKINGS..... 1000 FT

COMMENTS(DESCRIP. OF WORKINGS):
AN ADIT WITH SEVERAL BRANCHES AND A GLORY HOLE RAISE TO AN OPEN CUT IN THE ORE ZONE; SEVERAL TRENCHES AND SHALLO
SHAFTS

PRODUCTION
YES
SMALL PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 HG	ACC	0000.109	FL	1956-1968	

SOURCE OF INFORMATION (PRODUCTION).. BROOKS, 1968

RESERVES AND POTENTIAL RESOURCES

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE OR USE

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... MO54974
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 75 08

NAME AND LOCATION
DEPOSIT NAME..... MUDDY

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	DREW'S GAP

LATITUDE	LONGITUDE
42-10-47N	120-35-20W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4672320.0	699130.0	+10

TWP..... 039S
RANGE.... 018E
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED AT CENTER OF TOWNSHIP

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE
PRESENT/LAST OWNER..... C.H. GILMORE & OTHERS

DESCRIPTION OF DEPOSIT

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M029031
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... L3
- MAP CODE NO. OF REC..

REPORTER
- NAME..... WALKER, GEORGE W.
- DATE..... 78 01

NAME AND LOCATION
- DEPOSIT NAME..... MARTY K CLAIMS

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-22- N	120-34- W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4693142.1	700373.0	+10

- TWP..... 037S
- RANGE.... 018E
- SECTION.. 14
- MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... U HG

- ORE MATERIALS (MINERALS,ROCKS,ETC.):
  AUTUNITE, CINNABAR ?

- ANALYTICAL DATA(GENERAL)
  0.3 - EU; 0.38 - U; 0.2 - EU; 0.31 - U

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... WO17079
RECORD TYPE..... X1M
MAP CODE NO. OF REC..

REPORTER
NAME..... WEEKS, ROBERT
DATE..... 76
UPDATED..... 78 10
BY..... BRADLEY, R.; WALKER, G. W.

NAME AND LOCATION
DEPOSIT NAME..... MARTY K

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT (1964)

LATITUDE	LONGITUDE
42-21-37N	120-32-24W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4692525.0	302550.0	+10

TWP..... 037S
RANGE.... 018E
SECTION.. 13
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT..... U

PRODUCER(PAST OR PRESENT):
MAJOR PRODUCTS.. U

ORE MATERIALS (MINERALS,ROCKS,ETC.):
AUTUNITE

MAIN ORE MINERALS:

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M029037
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
DEPOSIT NO..... L9
MAP CODE NO. OF REC..

REPORTER
NAME..... WALKER, GEORGE W.
DATE..... 78 01

NAME AND LOCATION
DEPOSIT NAME..... LUCKY DAY AND TOPPER CLAIMS

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-19-30N	120-33-30W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4688535.0	701192.1	+10

TWP..... 037S
RANGE.... 018E
SECTION.. 26 35
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT..... U

ORE MATERIALS (MINERALS,ROCKS,ETC.):
AUTUNITE ?

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PRESENT/LAST OWNER..... DON TRACY

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M029035
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... L7
- MAP CODE NO. OF REC..

REPORTER
- NAME..... WALKER, GEORGE W.
- DATE..... 78 01

NAME AND LOCATION
- DEPOSIT NAME..... LOS OROS & BVD GROUPS
- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES
- STATE CODE..... OR
- STATE NAME: OREGON
- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-20- N	120-33-30W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4689460.4	701165.6	+10

- TWP..... 037S
- RANGE.... 018E
- SECTION.. 26
- MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... U

ORE MATERIALS (MINERALS,ROCKS,ETC.):
- AUTUNITE ?

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 2

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054979
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 76 08

NAME AND LOCATION
DEPOSIT NAME..... KINGWELL

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	PAISLEY

LATITUDE	LONGITUDE
42-44-58N	120-30-00W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4735820.0	704600.0	+10

TWP..... 032S
RANGE.... 019E
SECTION.. 32
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATION VERY APPROXIMATE

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M029041
- RECORD TYPE..... X1N
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... L13
- MAP CODE NO. OF REC..

REPORTER
- NAME..... WALKER, GEORGE W.
- DATE..... 78 01

NAME AND LOCATION
- DEPOSIT NAME..... HOPE CLAIMS

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-15-30N	120-33-30W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4681132.1	701404.5	+10

- TWP..... 038S
- RANGE.... 018E
- SECTION.. 23
- MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... U

- ANALYTICAL DATA(GENERAL)
  - 0.05 - U3O8

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 2
- PRESENT/LAST OWNER..... ROY SANDBERG

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M054980
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- INFORMATION SOURCE... BAILEY, E. H.
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 75 08

NAME AND LOCATION
- DEPOSIT NAME..... HART MOUNTAIN

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	HART LAKE

LATITUDE	LONGITUDE
42-26-37N	119-46-34W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4702550.0	271680.0	+11

- TWP..... 036S
- RANGE.... 025E
- MERIDIAN. WILLAMETTE

- LOCATION COMMENTS: LOCATED AT CENTER OF TOWNSHIP

COMMODITY INFORMATION
- COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 1
  PROPERTY IS INACTIVE

RIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M029039
RECORD TYPE..... K1N
COUNTRY/ORGANIZATION. USGS
DEPOSIT NO..... L11
MAP CODE NO. OF REC..

REPORTER
NAME..... WALKER, GEORGE W.
DATE..... 78 01

NAME AND LOCATION
DEPOSIT NAME..... HAMMERSLEY CLAIM

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-19- N	120-33-30N

UTM NORTHING	UTM EASTING	UTM ZONE NO
4687609.6	701218.7	+10

TWP..... 037S
RANGE.... 018E
SECTION.. 35
MERIDIAN. WILLAMETTE

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 2

DESCRIPTION OF DEPOSIT
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... MC54987
- RECORD TYPE..... XIM
- COUNTRY/ORGANIZATION. USGS
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 76 08
- UPDATED..... 78 10
- BY..... BRADLEY, R.; WALKER, G. W.

NAME AND LOCATION
- DEPOSIT NAME..... GRAY PROSPECT
- SYNONYM NAME..... WINDY HOLLOW, HOT SPOT

MINING DISTRICT/AREA/SUBDIST. LOST CABIN (ALSO KNOWN AS COYOTE HILL OR CAMP LOFTUS DISTRICT).

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	RABBIT HILLS SW

LATITUDE	LONGITUDE
42-32-02N	119-58-53W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4713140.0	255140.0	+11

- TWP..... 035S
- RANGE.... 023E
- SECTION.. 14 15
- MERIDIAN. WILLAMETTE

POSITION FROM NEAREST PROMINENT LOCALITY: 11 MI NW OF PLUSH

LOCATION COMMENTS: LOCATED ON SHAFT SYMBOL

COMMODITY INFORMATION

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CINNABAR; PYRITE, LIMONITE

MAIN ORE MINERALS:
CINNABAR

MINOR ORE MINERALS:
PYRITE, LIMONITE

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 4
PROPERTY IS INACTIVE
YEAR OF DISCOVERY..... 1934
BY WHOM..... ART CHAMPION
PRESENT/LAST OWNER..... GLENN GRAY, LYNN GRAY, ZANE GRAY, 1963

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
DISSEMINATED, FRACTURE COATINGS
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
STRIKE OF OREBODY.... NE
DIP OF OREBODY..... N

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND
LENGTH OF WORKINGS..... 230 FT

PRODUCTION
YES
SMALL PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 HG	ACC	0000.003	FL	TO 1963	

PRODUCTION YEARS..... 1941 - 1943

SOURCE OF INFORMATION (PRODUCTION).. BROOKS

PRODUCTION COMMENTS.... POSSIBLY 7 FL PRODUCED

GEOLOGY AND MINERALOGY

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... N054993
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 76 08
- UPDATED..... 81 03
- BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
- DEPOSIT NAME..... GLASS RIDGE MINE
- SYNONYM NAME..... CASCADE

- MINING DISTRICT/AREA/SUBDIST. GLASS BUTTES

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE
- DRAINAGE AREA..... 17070303 PACIFIC NORTHWEST
- PHYSIOGRAPHIC PROV..... 10 HIGH LAVA PLAINS
- LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 250000	BURNS

LATITUDE	LONGITUDE
43-31-20N	119-56-15W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4822800.	262600.	+11

- TWP..... 024S
- RANGE.... 023E
- SECTION.. 03
- MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... HG

POTENTIAL.....
OCCURRENCE..... HG

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CINNABAR

MAIN ORE MINERALS:
CINNABAR

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 6
PROPERTY IS INACTIVE
PRESENT/LAST OWNER..... ELMER SURRATT AND DEE TURNIDGE, 1978
PRESENT/LAST OPERATOR.... JACKSON MOUNTAIN MINING CO., 1968

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MINERALIZED FRACTURE ZONE, OPALITE
FORM/SHAPE OF DEPOSIT: POCKETS

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
STRIKE OF OREBODY.... NW

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND

PRODUCTION
YES
NO PRODUCTION
SMALL PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 HG	EST	0000.119	FL	1967-1968	

SOURCE OF INFORMATION (PRODUCTION).. COMPANY RECORDS VIA BROOKS, H. C., ODGMI

PRODUCTION COMMENTS.... PRODUCTION WAS FROM ABOUT 10000 TONS OF ORE

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... TERT
HOST ROCK TYPES..... OPALITE DERIVED FROM GLASSY SILICIC FLOWS AND TUFF

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M020018
RECORD TYPE..... X1M
INFORMATION SOURCE... 12
MAP CODE NO. OF REC..

REPORTER
NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
AFFILIATION..... ODGMI
DATE..... 81 01

NAME AND LOCATION
DEPOSIT NAME..... GAYLORD TUNNEL

MINING DISTRICT/AREA/SUBDIST. BRATTAIN

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE
DRAINAGE AREA..... 17120006 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 24000	PAISLEY

LATITUDE	LONGITUDE
42-38-20N	120-33-14W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4723400	700560	+10

TWP..... 033S
RANGE.... 018E
SECTION.. 11 12
MERIDIAN. WILLAMETTE

ALTITUDE.. 5800 FT

COMMODITY INFORMATION
COMMODITIES PRESENT..... AU AG ZN PB CU

POTENTIAL.....
OCCURRENCE..... AU CU

ORE MATERIALS (MINERALS,ROCKS,ETC.):
SPHALERITE, GALENA, PYRITE

MAIN ORE MINERALS:

MINOR ORE MINERALS:
CHALCOPYRITE, SILVER SULFIDES

ANALYTICAL DATA(GENERAL)
ODGMI SAMPLES ASSAYED 0.04-0.05 OZ/TON AU; TRACE-6.10 OZ/TON AG; TRACE-12.49% PB; TRACE-12.53% ZN

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 2
YEAR OF DISCOVERY..... 1900
BY WHOM..... FRANK BOSWELL

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
SHEAR ZONE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
MAX WIDTH..... 5 FT
STRIKE OF OREBODY.... N55W
DIP OF OREBODY..... 90

DESCRIPTION OF WORKINGS
UNDERGROUND

COMMENTS(DESCRIP. OF WORKINGS):
136 FT CROSSCUT WITH 65 FT DRIFT

PRODUCTION
NO PRODUCTION

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... EO-OLIGO
HOST ROCK TYPES..... RHYOLITE, ANDESITIC TUFFS AND BRECCIAS

AGE OF ASSOC. IGNEOUS ROCKS.. EO-OLIGO
IGNEOUS ROCK TYPES..... QUARTZ MONZONITE, DIORITE

PERTINENT MINERALOGY..... QUARTZ, CALCITE, CLAYS

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M020019
- RECORD TYPE..... X1M
- INFORMATION SOURCE... 12
- MAP CODE NO. OF REC..

REPORTER
- NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
- AFFILIATION..... ODGMI
- DATE..... 81 01

NAME AND LOCATION
- DEPOSIT NAME..... ENNIS BUTTE PROSPECTS

- MINING DISTRICT/AREA/SUBDIST. BRATTAIN

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE
- DRAINAGE AREA..... 17120006 PACIFIC NORTHWEST
- PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
- LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 24000	MORGAN BUTTE

LATITUDE	LONGITUDE
42-36-59N	120-31-42W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4720950	702720	+10

- TWP..... 034S
- RANGE.... 019E
- SECTION.. 18 19
- MERIDIAN. WILLAMETTE

- LOCATION COMMENTS: LOCATION APPROXIMATE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... PB ZN CU

SPHALERITE, GALENA, PYRITE, CHALCOPYRITE

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
SHEAR ZONES
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
STRIKE OF OREBODY.... N60W

DESCRIPTION OF WORKINGS
SURFACE

COMMENTS(DESCRIP. OF WORKINGS):
SEVERAL MINING COMPANIES HAVE DONE SHALLOW TRENCHING.

PRODUCTION
UNDETERMINED

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... OLIGO
HOST ROCK TYPES..... QUARTZ MONZONITE, DIORITE

AGE OF ASSOC. IGNEOUS ROCKS.. OLIGO
IGNEOUS ROCK TYPES..... QUARTZ MONZONITE, DIORITE

LOCAL GEOLOGY

COMMENTS (GEOLOGY AND MINERALOGY):
MINERALIZATION IS SPOTTY AND APPEARS TO BE CONFINED TO N60W TRENDING SHEARS

GENERAL REFERENCES
1) PETERSON, N.V. AND MCINTYRE, J.R., 1970, THE RECONNAISSANCE GEOLOGY AND MINERAL RESOURCES OF EASTERN KLAMATH COUNTY AND WESTERN LAKE COUNTY, OREGON; ODGMI BULL. 66, P. 51
2) MUNTZERT, J.K., 1969, GEOLOGY AND MINERAL DEPOSITS OF THE BRATTAIN DISTRICT, LAKE COUNTY, OREGON; OREGON STATE UNIV. MS THESIS, 70 PP.

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054975
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 76 08

NAME AND LOCATION
DEPOSIT NAME..... DOZER AND LUCKY STRIKE

COUNTRY CODE..... JS
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	CRANE MOUNTAIN

LATITUDE	LONGITUDE
42-02-26N	120-12-02W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4657870.0	731720.0	+10

TWP..... 041S
RANGE.... 021E
SECTION.. 01 02
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED AT CENTER OF SECTION BOUNDARY

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE
PRESENT/LAST OWNER..... JOHN RAUCH

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M029036
- RECORD TYPE..... X1N
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... L8
- MAP CODE NO. OF REC..

REPORTER
- NAME..... WALKER, GEORGE W.
- DATE..... 78 01

NAME AND LOCATION
- DEPOSIT NAME..... DIAMOND VEE

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-19- N	120-33-30W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4687609.6	701218.7	+10

- TWP..... 037S
- RANGE.... 018E
- SECTION.. 35
- MERIDIAN. WILLAMETTE

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 1

PRODUCTION
NO PRODUCTION

GEOLOGY AND MINERALOGY
- HOST ROCK TYPES..... TUFFS ?

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M054976
- RECORD TYPE..... MIM
- COUNTRY/ORGANIZATION. USGS
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 76 08
- UPDATED..... 81 03
- BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
- DEPOSIT NAME..... DIGMORE

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE
- DRAINAGE AREA..... 18020001 CALIFORNIA
- PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
- LAND CLASSIFICATION..... 00

QUAD SCALE	QUAD NO OR NAME
1: 24000	CROOKED CREEK VALLEY

LATITUDE	LONGITUDE
42-17-14N	120-17-48W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4684980.0	722900.0	+10

TWP.....	038S	038S
RANGE....	020E	021E
SECTION..	12	07
MERIDIAN.	WILLAMETTE	

- LOCATION COMMENTS: LOCATED AT CENTER OF SECTION BOUNDARY

COMMODITY INFORMATION
- COMMODITIES PRESENT..... HG

MAIN ORE MINERALS:
CINNABAR

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE
PRESENT/LAST OWNER..... J.W. REHART

DESCRIPTION OF DEPOSIT
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL

PRODUCTION
NO PRODUCTION

PRODUCTION COMMENTS.... NO PRODUCTION DATA

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... TERT
HOST ROCK TYPES..... TUFF

LOCAL GEOLOGY

SIGNIFICANT ALTERATION:
OPALIZED

GENERAL REFERENCES
1) MERCURY IN OREGON, 1965, USBM IC 8252

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... MO54988
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- INFORMATION SOURCE... BAILEY, E. H.
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 76 08
- UPDATED..... 81 03
- BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
- DEPOSIT NAME..... CURRIER
- SYNONYM NAME..... LUCKY BOY NO. 1

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE
- DRAINAGE AREA..... 17120005
- PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
- LAND CLASSIFICATION..... 01

QUAD SCALE	QUAD NO OR NAME
1: 24000	HARVEY CREEK

LATITUDE	LONGITUDE
42-44-58N	120-45-50W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4735200.	683000.	+10

- TWP..... 032S
- RANGE.... 016E
- SECTION.. 36
- MERIDIAN. WILLAMETTE

POSITION FROM NEAREST PROMINENT LOCALITY: 12 MI NW OF PAISLEY

LOCATION COMMENTS: LOCATED AT CENTER OF SECTION

MAJOR PRODUCTS.. HG

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.....
OCCURRENCE..... BA

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CINNABAR, NATIVE MERCURY

MAIN ORE MINERALS:
CINNABAR, NATIVE MERCURY, BARITE

MINOR ORE MINERALS:
PYRITE, LIMONITE

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 6
PROPERTY IS INACTIVE
YEAR OF DISCOVERY..... 1934
BY WHOM..... PRESENT OWNER
PRESENT/LAST OWNER..... W. M. CURRIER, 1963

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MINERALIZED SHEAR ZONE
FORM/SHAPE OF DEPOSIT: POCKETS

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
STRIKE OF OREBODY.... N
DIP OF OREBODY..... E

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND
LENGTH OF WORKINGS..... 100 FT

PRODUCTION
YES
SMALL PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 HG	ACC	0000.003	FL	TO 1963	

SOURCE OF INFORMATION (PRODUCTION).. BROOKS

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054981
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 76 08

NAME AND LOCATION
DEPOSIT NAME..... CHEWANCAN RIVER

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	PAISLEY

LATITUDE	LONGITUDE
42-37-44N	120-36-04W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4722180.0	696720.0	+10

TWP..... 034S
RANGE.... 018E
SECTION.. 09 16
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED AT CENTER OF SECTION BOUNDARY

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE
YEAR OF DISCOVERY..... ABOUT 1935
BY WHOM..... JACK BARHAM

RIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054977
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 76 08

NAME AND LOCATION
DEPOSIT NAME..... BOBCAT
SYNONYM NAME..... BOT CAT (?)

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE
1: 24000

QUAD NO OR NAME
FITZWATER POINT

LATITUDE
42-02-27N

LONGITUDE
120-36-00W

UTM NORTHING
4656890.0

UTM EASTING
698640.0

UTM ZONE NO
+10

TWP..... 041S
RANGE.... 018E
SECTION.. 04
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED AT CENTER OF SECTION

OMMODITY INFORMATION
COMMODITIES PRESENT..... HG

XPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE
PRESENT/LAST OWNER..... G.L. BATMAN, A.G. HUNTLEY, & DON MORRISON

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054978
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 75 08

NAME AND LOCATION
DEPOSIT NAME..... BIG SURPRISE

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	FITZWATER POINT

LATITUDE	LONGITUDE
42-01-18N	120-35-25W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4654790.0	699500.0	+10

TWP..... 041S
RANGE.... 018E
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED AT APPROXIMATE CENTER OF TOWNSHIP

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE
PRESENT/LAST OWNER..... G.L. BATMAN

SIZE OF DEPOSIT..... SMALL

PRODUCTION
NO PRODUCTION

PRODUCTION COMMENTS.... NO PRODUCTION DATA

GENERAL REFERENCES
1) MERCURY IN OREGON; 1965, USBM IC 8252

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M029033
- RECORD TYPE..... X1N
- COUNTRY/ORGANIZATION. USGS
- DEPOSIT NO..... L5
- MAP CODE NO. OF REC..

REPORTER
- NAME..... WALKER, GEORGE W.
- DATE..... 78 01

NAME AND LOCATION
- DEPOSIT NAME..... BIG ENOUGH CLAIM

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COX FLAT

LATITUDE	LONGITUDE
42-19- N	120-36- W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4687511.9	697784.7	+10

- TWP..... 037S
- RANGE.... 018E
- SECTION.. 33
- MERIDIAN. WILLAMETTE

ANALYTICAL DATA(GENERAL)
- 0.03 - EU

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 1
- PRESENT/LAST OWNER..... J.W. STOTT

PRODUCTION
- NO PRODUCTION

RIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M015527
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... BRADLEY, R.; WALKER, G. W.
DATE..... 78 10
UPDATED..... 81 03
BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
DEPOSIT NAME..... BIG ENOUGH CLAIM

MINING DISTRICT/AREA/SUBDIST. LAKEVIEW AREA

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE
DRAINAGE AREA..... 18020001 CALIFORNIA
PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE

QUAD SCALE	QUAD NO OR NAME
1:	COX FLAT (1964)

LATITUDE	LONGITUDE
42-18-41N	120-36-33W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4686900.	697050.	+10

TWP..... 037S
RANGE.... 013E
SECTION.. 33
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT..... U

ORE MATERIALS (MINERALS,ROCKS,ETC.):
APPLE GREEN URANIUM MINERALS

ANALYTICAL DATA(GENERAL)
U3O8 EQUIV. = .035

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 2
PRESENT/LAST OWNER..... J. W. STOTT, 1955

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MINERALIZED FRACTURE ZONE

PRODUCTION
NO PRODUCTION

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... MIO-PLIO
HOST ROCK TYPES..... SILICIC ASH FLOW TUFF CARBONACEOUS ARGILLITE CARBONIZED WOOD

GENERAL REFERENCES
1) MATTHEWS, T.C., DEC. 1955 , OREGON RADIOACTIVE DISCOVERIES IN 1954 AND 1955 : OOGMI ORE BIN, VOL. 17 , NO. 12
2) PETERSON, N. V. AND MCINTYRE, J. R., 1970, THE RECONNAISANCE GEOLOGY AND MINERAL RESOURCES OF EASTERN KLAMATH COUNTY AND WESTERN LAKE COUNTY, OREGN: OOGMI BULL. 66, P. 46

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M054982
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 76 08

NAME AND LOCATION
- DEPOSIT NAME..... BATMAN
- SYNONYM NAME..... BATMAN AND WILSON

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	FITZWATER POINT

LATITUDE	LONGITUDE
42-02-27N	120-36-00W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4655890.0	698640.0	+10

- TWP..... 041S
- RANGE.... 018E
- SECTION.. 04
- MERIDIAN. WILLAMETTE

- LOCATION COMMENTS: LOCATED AT CENTER OF SECTION

COMMODITY INFORMATION
- COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
- STATUS OF EXPLOR. OR DEV. 1
  PROPERTY IS INACTIVE
- YEAR OF DISCOVERY..... PRIOR TO 1940

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M029032
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
DEPOSIT NO..... L4
MAP CODE NO. OF REC..

REPORTER
NAME..... WALKER, GEORGE W.
DATE..... 78 01

NAME AND LOCATION
DEPOSIT NAME..... BALD BUTTE CLAIM

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COFFEEPOT CREEK

LATITUDE	LONGITUDE
42-33-30N	120-38- W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4714270.7	694289.2	+10

TWP..... 035S
RANGE.... 018E
SECTION.. 06
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT..... U

ANALYTICAL DATA(GENERAL)
0.04 - EU

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M015526
RECORD TYPE..... X1M
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... BRADLEY, R.; WALKER, G. W.
DATE..... 78 10

NAME AND LOCATION
DEPOSIT NAME..... BALD BUTTE CLAIM

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	COFFEE POT CREEK (1966)

LATITUDE	LONGITUDE
42-33-49N	120-38-15W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4714870.0	693930.0	+10

TWP..... 035S
RANGE.... 018E
SECTION.. 05
MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
COMMODITIES PRESENT..... U

ORE MATERIALS (MINERALS,ROCKS,ETC.):
URANIUM MINERALS UNKNOWN

MAIN ORE MINERALS:
URANIUM MINERALS UNKNOWN

ANALYTICAL DATA(GENERAL)
U3O8 EQUIV. = .035

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M054592
- RECORD TYPE..... X1M
- COUNTRY/ORGANIZATION. USGS
- INFORMATION SOURCE... BAILEY, E. H.
- MAP CODE NO. OF REC..

REPORTER
- NAME..... PETERSON, JOCELYN A.
- DATE..... 75 08
- UPDATED..... 81 03
- BY..... FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
- DEPOSIT NAME..... ANGEL PEAK
- SYNONYM NAME..... FOUR SQUARE

- MINING DISTRICT/AREA/SUBDIST. QUARTZ MOUNTAIN

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE
- DRAINAGE AREA..... 18020001 CALIFORNIA
- PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
- LAND CLASSIFICATION..... 41

QUAD SCALE	QUAD NO OR NAME
1: 24000	COUGAR PEAK

LATITUDE	LONGITUDE
42-19-16N	120-44-35W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4687680.0	685980.0	+10

- TWP..... 037S
- RANGE.... 017E
- SECTION.. 32
- MERIDIAN. WILLAMETTE

- LOCATION COMMENTS: NW/4 NW/4 SEC 32

MAJOR PRODUCTS.. HG

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CINNABAR

MAIN ORE MINERALS:
CINNABAR

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 6
PROPERTY IS INACTIVE
YEAR OF DISCOVERY..... 1956
BY WHOM..... PRESENT OWNERS
PRESENT/LAST OWNER..... LYNN TOMLIN, G. B. JOHNSTON, D. V. MORRISON, 1963

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
MINERALIZED FRACTURE ZONE
FORM/SHAPE OF DEPOSIT: PODS

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
MAX LENGTH..... 40 FT
MAX WIDTH..... 20 FT
MAX THICKNESS..... 15 FT

DESCRIPTION OF WORKINGS
SURFACE

PRODUCTION
YES
SMALL PRODUCTION

CUMULATIVE PRODUCTION (ORE,COMMOD.,CONC.,OVERBUR.)

ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE,REMARKS
15 HG	ACC	0000.034	FL	TO 1963	ORE AVERAGED LESS THAN 4 LBS HG PER TON

PRODUCTION YEARS..... 1958 - 1959

SOURCE OF INFORMATION (PRODUCTION).. BROOKS

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... TERT-QUAT
HOST ROCK TYPES..... SILICIC LAVAS TUFF TUFF BRECCIA VITROPHERE

RIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M054983
RECORD TYPE..... XIM
COUNTRY/ORGANIZATION. USGS
MAP CODE NO. OF REC..

REPORTER
NAME..... PETERSON, JOCELYN A.
DATE..... 76 08

NAME AND LOCATION
DEPOSIT NAME..... ADEL

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE

QUAD SCALE	QUAD NO OR NAME
1: 24000	ADEL

LATITUDE	LONGITUDE
42-10-53N	119-53-06W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4673720.0	261740.0	+11

TWP..... 039S
RANGE.... 024E
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: LOCATED AT CENTER OF TOWNSHIP

COMMODITY INFORMATION
COMMODITIES PRESENT..... HG

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 1
PROPERTY IS INACTIVE

DESCRIPTION OF DEPOSIT

Other Uranium Occurrences

First, the Josephine County occurrence listed in the Ore-Bin summaries is false. This sample is said to have come from someplace in Utah not the Greenback district.

The principal remaining occurrence is the Bear Creek claim east of Bend in Crook County. This claim is being worked sporadically by Roseburg, Oregon people.

This operation should be watched. I don't believe it will make a mine but it is the "best of the rest." Drilling was contemplated.

The best reference on this is a thesis by W. A. Lowry, Geology of the Bear Creek Area, Crook and Deschutes Counties, Oregon, 1940, OSC. A brief recon to check contacts on this map was made.

It is thought that the Salem Hills and Powell Buttes occurrences are of academic interest only. The Salem Hills minerals are disseminated in Illahee (Eugene Olig. equiv.). It is thought that the source of the uranium is through the weathering of tuff and release of contained uranium. Two questions arise: Is there enough tuff present, and would uranium be released as volcanic glass went to a clay. This last question also applies to a proposed origin of the radioactivity at Powell Butte. Two theories for this deposit have been proposed: leaching and weathering of volcanic rocks by ground water traveling along fractures and subsequent re-deposition along these fractures; or, uranium deposited in a collapse breccia by uranium-rich late-magmatic or deuteric solutions as a last stage of volcanic activity. One angle on this latter theory might be a hunt for other trace elements which would be concentrated in a residual liquid (?) along with uranium. The presence of a suite of these elements would help to substantiate this latter idea. Personally, I would rather have the

first idea, at this stage anyway.

About all the information available on these deposits and other occurrences is contained in the green-sheet reports on uranium which I have collected together, and in past Ore-Bin articles. Wag has a deposit near Baker which no one has been allowed to look at, and Brooks in Baker is a uranium "expert". Call on him for any "idea thrashing".

Main Questions

Following are some of the principal problems that have presented their ugly but fascinating countenances during the work thus far. It is felt that most of these problems will relate only to one or a couple of different occurrences. Broadly speaking, there does not seem to be much correlation between separate localities. Further work will undoubtedly fix this statement.

Foremost will be the problem at the White King-Lucky Lass properties --age of the rocks, geologic column, status of the opalized rock (definite layer, series of plugs, etc.) paragenesis of ores (two distinct generations of low and med. T minerals? or low T galena in deeper. (It just occurs that some of the "realgar" in the upper parts of the mine might be litharge, a lead mineral.) The structural details need a lot more work. This is a beginning.

At the other occurrences, origin and ore control are probably the outstanding problems. The origin of these deposits is probably the most interesting problem of most of them.

This is about all for a brief summary of what has been done. Have fun.

Elementary particles

Nucleon - either proton or neutron have almost equal mass
proton has positive charge -

The largest occurring nucleus is that of uranium 238 which contains 92 protons and 146 neutrons

The nucleus is a tightly bound structure of high density

Nuclear charge or atomic number Z is the integral number of protons in the nucleus. The total number of nucleons in a nucleus is the mass number A

Nuclei of same Z but of different A are different forms of the same element and are called isotopes.

The mass of an electron or a beta particle is only about 1/2000 the mass of a proton — when a nucleus decays by beta emission Z increases by 1 unit, because 1 negative charge is removed and A remains essentially constant.

Alpha particles are essentially the nuclei of helium $(He^4)^{++}$ and thus have a mass of 4 atomic mass units thus a particle decaying by α emission, ~~it~~ Z will decrease by 2 and A by 4.

ev = electron volts = 1.6×10^{-12} erg
Mev = million " "
Bev = billion " "

α particles have energies of several Mev
beta rays range from fractions of ev to several Mev
energy of cosmic rays goes up into the Bev

high energy = hard radiation
low energy = soft

A series is said to be in equilibrium when for each decaying parent atom one of each intermediate daughter atom also decays (on the average). The number of atom of each intermediate daughter will then be in direct proportion to its halflife T or inverse proportion to the respective decay constant λ. The ultimate (Stable) daughter will continue to increase at a decreasing rate.

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$$t = \frac{c\,Pb}{a}$$

t = age in millions of years
Pb = lead in parts per million
a = is the radioactivity in alphas per milligram hour
c = constant 2600 for U alone and 1990 for Th alone

PROJECT NAME: COYOTE HILLS

ALSO KNOWN AS: P C CLAIMS, COY CLAIMS, COY GROUP

OWNER(S): COMINCO AMERICAN INC (OPTIONEE)
U S MINERALS EXPLORATION CO (OPTIONOR)

METAL(S): GOLD
SILVER

EXPL. STATUS: EXPLORATION
ACTIVITY STATUS: ACTIVE

MINESEARCH #: 101106

MOST RECENT SOURCE: OCTOBER 1985

LOCATION

STATE: OREGON
COUNTY: LAKE

THE PROPERTY IS IN T35S, R23E, LAKE COUNTY.

GENERAL COMMENTS

USMX FIRST EVALUATED THE PROPERTY IN 1981 AND DISCOVERED ANOMALOUS GOLD AND SILVER VALUES. THE CLAIMS WERE DRILLED BY CHEVRON, AND ARE CURRENTLY BEING DRILLED BY COMINCO. (DC 7/85)

DESCRIPTION OF CLAIMS

THIS PROPERTY CONSISTS OF UNPATENTED CLAIMS ON 2,066 ACRES.

WORK HISTORY

1981: USMX DID INITIAL EVALUATIONS OF THE PROPERTY.
1983: CHEVRON TOOK AN OPTION IN JANUARY AND PUT DOWN SOME DD HOLES.
1984: CHEVRON DROPPED ITS OPTION EARLY IN THE YEAR AND COMINCO PICKED IT UP. COMINCO STARTED DRILLING IN MAY. (DC 10/85)

CURRENT WORK PLAN

1985: COMINCO PLANS TO CONDUCT AN EXTENSIVE ROTARY DRILL PROGRAM. (DC 7/85)

TRANSACTION REPORT 1

TRANSACTION DATE:1984
TRANSACTION TYPE:EARN-IN

PARTY#1: U S MINERALS EXPLORATION CO
DESIGNATION 1: OPTIONOR
ORIGINAL INT 1: 100
POTENTIAL INT 1: 40

PARTY#2: COMINCO AMERICAN INC
DESIGNATION 2: OPTIONEE
ORIGINAL INT 2: 0
POTENTIAL INT 2: 60

COMINCO CAN EARN UP TO 60% IN THE PROPERTY BY SPENDING $715,000 FOR EXPLORATION AND DEVELOPMENT OVER A FIVE-YEAR PERIOD.
USMX CAN EITHER RETAIN A 40% WORKING INTEREST OR CONVERT IT TO A 5% NSR. (USMX 10K 1984)

TRANSACTION REPORT 2

TRANSACTION DATE:1982
TRANSACTION TYPE:EARN-IN-TERMINATED

PARTY#1: U S MINERALS EXPLORATION CO
DESIGNATION 1: OPTIONOR
ORIGINAL INT 1: 100
POTENTIAL INT 1: 40

PARTY#2: CHEVRON RESOURCES
DESIGNATION 2: OPTIONEE
ORIGINAL INT 2: 0
POTENTIAL INT 2: 60

THE AGREEMENT IS FOR CHEVRON TO EXPLORE THE COY PROPERTY. IF THE EXPLORATION IS SUCCESSFUL, CHEVRON MUST BRING THE PROPERTY TO THE STAGE OF FEASIBILITY BEFORE USMX ELECTS EITHER TO PARTICIPATE AS A 40% WORKING INTEREST PARTNER OR RETAIN A 5% NSR. USMX RECEIVED $10,000 UPON SIGNING THE AGREEMENT. MINIMUM ANNUAL PAYMENTS AND WORK COMMITMENTS MUST BE MET BY CHEVRON TO KEEP THE AGREEMENT IN FORCE. (USMX 1QR 1982)

COMPANY INFORMATION

Cominco American Inc.
818 Riverside Ave.
Spokane, WA 99201
(509) 747-6111

BIBLIOGRAPHY

U.S. minerals Exploration Co Annual Report 1981
U.S. Minerals Exploration 1st Quarter Report 1982
Personal Conversation 1/83
U.S. Minerals exploration Annual Report 1983, 1984
Personal Conversation 6/85 and Direct Correspondence 7/85, 10/85
Oregon Geology 4/85

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO..... M020028
RECORD TYPE..... X1M
INFORMATION SOURCE... 12
MAP CODE NO. OF REC..

REPORTER
NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
AFFILIATION..... ODGMI
DATE..... 81 01

NAME AND LOCATION
DEPOSIT NAME..... JUMBO
SYNONYM NAME..... ELEPHANT

MINING DISTRICT/AREA/SUBDIST. LOST CABIN (WINDY HOLLOW)

COUNTRY CODE..... US
COUNTRY NAME: UNITED STATES

STATE CODE..... OR
STATE NAME: OREGON

COUNTY..... LAKE
DRAINAGE AREA..... 17120007 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 24000	RABBIT HILLS SW (1967)

LATITUDE	LONGITUDE
42-31-41N	119-58-45W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4712500	255000	+11

TWP..... 035S
RANGE.... 023E
SECTION.. 14 15 23
MERIDIAN. WILLAMETTE

LOCATION COMMENTS: N 1/2 SEC 23

COMMODITY INFORMATION
COMMODITIES PRESENT..... AU AG CU

ORE MATERIALS (MINERALS,ROCKS,ETC.):
FREE GOLD

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 2
YEAR OF DISCOVERY..... 1912
BY WHOM..... JOHN LOFTUS

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
DISSEMINATED; SHEAR ZONE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND

COMMENTS(DESCRIP. OF WORKINGS):
SHAFT AND 175 FT TUNNEL.

PRODUCTION
NO PRODUCTION
UNDETERMINED

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... MIO?
HOST ROCK TYPES..... RHYOLITE TUFF AND BRECCIA

PERTINENT MINERALOGY..... HEMATITE, OPAL, HYALITE

IMPORTANT ORE CONTROL/LOCUS.. SHEAR ZONES

LOCAL GEOLOGY

GEOLOGICAL PROCESSES OF CONCENTRATION OR ENRICHMENT:
SECONDARY ENRICHMENT

COMMENTS (GEOLOGY AND MINERALOGY):
PRIMARY SULPHIDES ARE OCCASIONALLY FOUND AS SPARSE DISSEMINATIONS OR AS FINE STRINGERS IN A LIGHT COLORED RHYOLITE. SECONDARY ENRICHMENT HAS PRODUCED LOCAL HIGH-GRADE POCKETS

GENERAL COMMENTS
LITTLE INFORMATION AVAILABLE.

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M020027
- RECORD TYPE..... X1M
- INFORMATION SOURCE... 12
- MAP CODE NO. OF REC..

REPORTER
- NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
- AFFILIATION..... ODGMI
- DATE..... 81 01

NAME AND LOCATION
- DEPOSIT NAME..... COYOTE HILLS MINING CO.
- SYNONYM NAME..... LYON PROSPECT

- MINING DISTRICT/AREA/SUBDIST. LOST CABIN (WINDY HOLLOW)

- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES

- STATE CODE..... OR
- STATE NAME: OREGON

- COUNTY..... LAKE
- DRAINAGE AREA..... 17120007 PACIFIC NORTHWEST
- PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
- LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 24000	COOPER DRAW (1968)

LATITUDE	LONGITUDE
42-31-58N	120-00-19W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4713050	745950	+10

- TWP..... 035S
- RANGE.... 023E
- SECTION.. 15 16
- MERIDIAN. WILLAMETTE

COMMODITY INFORMATION
- COMMODITIES PRESENT..... AU AG CU

FREE GOLD, COPPER SULPHATES

ANALYTICAL DATA(GENERAL)
ODGMI SAMPLES ASSAYED NIL-1.11 OZ/TON AU

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 2

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
DISSEMINATED; SHEAR ZONE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL

DESCRIPTION OF WORKINGS
UNDERGROUND

COMMENTS(DESCRIP. OF WORKINGS):
ABOUT 600 FT OF TUNNELS

PRODUCTION
NO PRODUCTION
UNDETERMINED

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... MIO
HOST ROCK TYPES..... RHYOLITE AND RHYOLITE BRECCIA

PERTINENT MINERALOGY..... MANGANESE OXIDES, QUARTZ, LIMONITE

IMPORTANT ORE CONTROL/LOCUS.. SHEAR ZONES

LOCAL GEOLOGY

GEOLOGICAL PROCESSES OF CONCENTRATION OR ENRICHMENT:
SECONDARY ENRICHMENT

COMMENTS (GEOLOGY AND MINERALOGY):
OXIDES AND FREE GOLD ARE APPARENTLY DERIVED FROM OCCASSIONAL AREAS OF PYRITIC RHYOLITE.

GENERAL COMMENTS
LITTLE INFORMATION AVAILABLE

GENERAL REFERENCES

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
- RECORD NO..... M020017
- RECORD TYPE..... X1M
- INFORMATION SOURCE... 2
- MAP CODE NO. OF REC..

REPORTER
- NAME..... FERNS, MARK L. (BROOKS, HOWARD C.)
- AFFILIATION..... ODGMI
- DATE..... 81 01

NAME AND LOCATION
- DEPOSIT NAME..... BALDEAGLE
- MINING DISTRICT/AREA/SUBDIST. BRATTAIN
- COUNTRY CODE..... US
- COUNTRY NAME: UNITED STATES
- STATE CODE..... OR
- STATE NAME: OREGON
- COUNTY..... LAKE
- DRAINAGE AREA..... 17120006 PACIFIC NORTHWEST
- PHYSIOGRAPHIC PROV..... 12 BASIN AND RANGE
- LAND CLASSIFICATION..... 49

QUAD SCALE	QUAD NO OR NAME
1: 24000	PAISLEY (1966)

LATITUDE	LONGITUDE
42-38-41N	120-33-01W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4724045	700840	+10

- TWP..... 035S
- RANGE.... 018E
- SECTION.. 01 02
- MERIDIAN. WILLAMETTE
- ALTITUDE.. 5800 FT

COMMODITY INFORMATION
- COMMODITIES PRESENT..... AU AG ZN PB CU

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.....
OCCURRENCE..... CU

ORE MATERIALS (MINERALS,ROCKS,ETC.):
SPHALERITE, GALENA, PYRITE

ANALYTICAL DATA(GENERAL)
ODGMI SAMPLES ASSAYED 0.015-0.030 OZ/TON AU; TRACE AG; TRACE PB; 0.20-3.69% ZN

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 2

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
SHEAR ZONE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT..... SMALL
MAX WIDTH..... 5 FT
STRIKE OF OREBODY.... N10E
DIP OF OREBODY..... 90

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND

COMMENTS(DESCRIP. OF WORKINGS):
70 FT SHAFT WITH SEVERAL SHALLOW PITS ANDS TRENCHES

PRODUCTION
NO PRODUCTION

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS..... EO-OLIGO
HOST ROCK TYPES..... RHYOLITE, ANDESITE TUFFS AND BRECCIAS

AGE OF ASSOC. IGNEOUS ROCKS.. EO-OLIGO
IGNEOUS ROCK TYPES..... DIORITE, QUARTZ MONZONITE

PERTINENT MINERALOGY..... QUARTZ, CALCITE, CLAYS

GENERAL REFERENCES
1) BALDWIN, E.M. AND MASON, R.S., 1947, PAISLEY LEAD-ZINC DISTRICT: ODGMI UNPUBLISHED FILE REPORT

STATUS OF STUDIES - MAY 1960
STATE OF OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Publications - 1959

(1) Lode mines of the central part of the Granite mining district, Grant County, Oregon: Bulletin 49, by George S. Koch, Jr.

(2) Field guidebook - geologic trips along Oregon highways: Bulletin 50, prepared under direction of W. D. Wilkinson.

(3) Dry hole map of Oregon: available on request at reproduction cost. Prepared by V. C. Newton, Jr.

(4) Natural sources of carbon dioxide in Oregon: ORE.-BIN, Vol. 21, no. 11, p. 103-113, by N. S. Wagner.

Manuscripts completed

(1) Chromite deposits of southwestern Oregon: by Len Ramp. (Will be published as a bulletin.)

(2) Geology of the Ironside Mountain quadrangle: by Wallace D. Lowry. (Will be published as a bulletin.)

(3) Stratigraphic implications of foraminifera from the Tertiary of western Oregon: by R. E. Stewart. (Will be published as a bulletin.)

(4) Fossil localities of western Oregon: by Margaret L. Steere. (Will be published as a bulletin.)

(5) Bibliography of Oregon geology and mineral resources: by Margaret L. Steere. (Will be published as a bulletin.)

NOTE: All field work and editing of manuscripts have been completed. Publication must await availability of funds from the 1961-63 biennium.

Field work completed and manuscripts in preparation

(1) Geology of the Mitchell Butte quadrangle: by R. E. Corcoran. Map drafting complete. Manuscript 60 percent complete. Corcoran will return to the Department's staff June 1960, at which time manuscript progress will be accelerated. Completion date set for January 1961. Publication must await availability of funds. Will be published in the Map Series.

(2) Quicksilver in Oregon: by H. C. Brooks. Field work completed 1959. First draft of manuscript received May 1960. Map preparation one-third complete. Finish date set for March 1961. Publication must await availability of funds. Will replace old Bulletin 4.

(3) Intrusive rocks of the central Coast Range, Oregon: a cooperative project between the Fuels Branch, U.S. Geological Survey, and the Department. H. G. Schlicker, Department author. Manuscript under preparation and review. Finish date set for April 1961. Publication will be as a bulletin of the Department but must await availability of funds.

(4) (Exact title not established): by L. W. Vigrass and W. R. Dickinson. Arrangements have been completed with the authors for publishing of their detailed work in the Izee 3, Dayville 4, Riley 1, and Burns 2 quadrangles at a scale of 1:36,000. Authors will submit map manuscript and text manuscript when possible - probably in 1960. Publication schedule not definitely established. Will be published as a bulletin.

Established projects, field work under way (1960)

(1) Physical characteristics of the nepheline syenite deposits of the Coast Range, Oregon: a cooperative project between the U.S. Bureau of Mines and the Department. Under the direction of H. G. Schlicker (Department of Geology and Mineral Industries) and Hal Kelly (U.S. Bureau of Mines Ceramic Laboratory). Department's work to be completed June 30, 1960. May be published as a separate section of bulletin on intrusive rocks of the Central Coast Range.

(2) Copper in Oregon: project under the direction of George S. Koch, Jr. Purpose: to determine environment of copper mineralization in the State of Oregon. The project is divided into three units with subdivisions in each unit. Unit 1 (northeastern Oregon) is presently under investigation. Results of studies on Units 1 and 3 (southwestern Oregon) will be published together and as a bulletin. Publication target date set for 1965.

Northeastern Oregon: Emphasis to be placed on rock types and field relations of Clover Creek greenstone.

Sparta quadrangle: Mapping by Harold Prostka, assisted by J. N. Lukanuski. This will be Mr. Prostka's second season and Mr. Lukanuski's first in this quadrangle. Field work completion date set for September 1960. The work will be used by Prostka as a PhD dissertation at The Johns Hopkins University. Summary of geology and geologic map will be published in Geologic Map Series. Target for publication is set for early 1962.

Baker 1 and Telocaset 4 quadrangles: mapping by Richard Bowen, assisted by R. L. Bateman. This will be Bowen's and Bateman's first year on the project and a continuation of the mapping by Koch in 1959. Field work completion date set for September 1960. Summary of geology and geologic map of Baker 1 quadrangle will be published in Geologic Map Series. Target for publication is set for early 1962.

(3) Uranium deposits in Oregon: by Norman V. Peterson. This is a continuation of the work begun in 1956 and marks Peterson's third season on the project. Completion date for field work originally set for end of season 1960. The project is to be expanded and a field assistant is to be added in 1961. Present target date for field completion set for September 1961. Preliminary maps and reports were published in THE ORE.-BIN of December 1958 and February 1959. Paper delivered at 1960 AIME Pacific Northwest Metals and Minerals Conference. Publication date of bulletin tentatively set for 1963.

(4) Geology of central Oregon: by H. J. Buddenhagen. Buddenhagen is on a WAE basis with the Department. This work, started in 1957, is a combination of new field work, extensive photogeologic studies, and the compilation of existing work. Work continues throughout the year as Buddenhagen can find time from his consulting and farm work. It now appears that field work and manuscript will be completed in 1961. This is not firm. Publication in bulletin form.

(5) Stratigraphy and micropaleontology of the Paleozoic rocks of Oregon: by David A. Bostwick. Half of this project will consist of field work, the other half will be examination of fossils and lithologies. Stratigraphic correlation will be made, where possible, between Paleozoic units in Oregon and between those of Oregon and adjoining states. Where feasible, geologic sections will be logged in detail to include lithologies and fossils. This work will be, in large part, for the State geologic map. This will be Bostwick's second and final year on this project. Manuscript target set for 1962 and publication as a bulletin for 1963.

(6) Special studies: (These are studies covering limited areas, reactivation of recessed studies which were nearly complete or salvage of recessed studies, and examinations that are a continuing part of the Department operation. In most cases, publication will be in THE ORE.-BIN. Work by field office personnel as time allows from other duties.)

(a) Native building stones and sources of lightweight aggregates in Oregon by Ralph S. Mason. Purpose: to bring attention to the many suitable building stones, especially the volcanic tuffs, of Oregon. Target date for publishing as a Short Paper, early 1962.

(b) Spectrographic analyses of volcanic cinders and volcanic ash by T. C. Matthews. An informal cooperative study with James Barlow, geologist with Leonard Lundgren, Bend, Purpose: to determine if volcanic materials have any special soil building characteristics.

(c) Reconnaissance map of the Dale quadrangle by N. S. Wagner. State geologic map. Completion of work started in 1956.

(d) Reconnaissance map of the Durkee quadrangle by H. C. Brooks. State geologic map. Completion of work started in 1957.

(e) Revision of Metal Mines Handbooks, eastern Oregon, by N. S. Wagner and H. C. Brooks. Purpose: to update old Bulletin 14, now out of print.

(f) Investigation of magnetite in the Brogan area of northern Malheur County by N. S. Wagner and H. C. Brooks. Preliminary work, summer 1960.

(g) Investigation of black sands in pre-Tertiary inlier of central Oregon by N. S. Wagner and H. C. Brooks. Preliminary work, summer 1960.

(h) Diatomite in eastern Oregon by H. C. Brooks. Purpose: to determine feasibility of project on diatomite. Summer 1960.

(i) Geology of the Quartz Mountain area by Len Ramp. An informal cooperative project with Hanna Mining Company. Completion of work started in 1959. ORE.-BIN publication.

(j) Detailed mapping of selected areas in the metasedimentary bands in the Applegate series by Len Ramp. Work mainly in areas of limestone lenses. A continuing project. ORE.-BIN publication.

Authorized projects, field work to start 1960

(Funds available for current biennium)

(1) Copper in Oregon: project under the direction of George S. Koch, Jr.

Northeastern Oregon (Unit 1): Geochemical investigations by Richard G. Bowen. Field work to begin upon completion of geologic mapping, estimated at late September 1960, and to continue until weather prohibits work. Target for 1960 is to determine geochemical background of whole area. Detail work to commence in May 1961. Completion date tentatively set for October 1961.

Bohemia district (Unit 2 - western Oregon): geologic mapping and geochemical investigations by Richard J. Lutton. Field work to begin June 6, 1960. Field work completion date set for October 1961. Lutton will use this work for a PhD dissertation at the University of Arizona. Publication will be as a Department bulletin and is tentatively set for 1963.

(2) Geology of the Dallas and Valsetz quadrangles: by Ewart M. Baldwin. Revision of Bulletin 35, now out of print. Work to begin July 1 and end August 31, 1960. Republishing as soon as funds are available.

(3) Landslide areas in the Portland Hills by Herbert G. Schlicker. Purpose: to delineate areas of past and present landsliding as an aid in the housing and recreation development of metropolitan Portland. Field work to begin July 1, 1960, and terminate July 1, 1961. Publication to be in Map Series, late 1962.

(4) Geologic reconnaissance of southeastern Oregon: by R.E. Corcoran. Purpose: for State geologic map. Mr. Corcoran, a stratigrapher, will join the staff May 16, 1960. He replaces R. E. Stewart, micropaleontologist, retired. The micropaleontology study of Tertiary sediments will be recessed within the Department. Emphasis will now be placed on completing the State geologic map.

(5) Structure and petrography of the Juntura welded tuff by Hollis M. Dole, Richard G. Bowen, and R. E. Corcoran. Purpose: to accurately determine late Tertiary faulting in southeastern Oregon and contribute to the welded tuff problem. Work to be a combination of photogeologic, petrographic and field studies. Work as time permits. Publication in THE ORE.-BIN.

(6) Geology of State Parks: by Margaret L. Steere. Commencement will depend on release from responsibilities as librarian. Purpose: to answer surging demand of interested layman in the areas of the rapidly developing State Park system. Results to be published separately on selected areas of park concentrations and as a new publication series.

Future projects

(1) Geology of Ivers Peak, Tyee, Sitkum, Camas Valley, Bone Mountain, and Dutchman Butte quadrangles: by Ewart M. Baldwin, Hollis M. Dole, Norman V. Peterson, and Len Ramp. A cooperative project between the Fuels Division of the U.S. Geological Survey and the Department. Purpose: to present geologic data on the Klamath Mountains - Coast Range border and Coast Range basin and the Umpqua formation - Tyee formation contact problem. Work to commence June 1961. Target date for completion of field work September 1962. Tentative publication date as a bulletin set for 1964.

(2) Engineering geology of southern Willamette Valley: by H.G. Schlicker. Purpose: to delineate construction materials adjacent to and within the Willamette Valley, and to map surficial deposits with emphasis on construction characteristics. Work to commence upon completion of landslide study in Portland Hills. Target date set for start, July 1, 1961. Completion date not determined.

(3) Geochemical prospecting for quicksilver ores in Oregon: by Robert Learned. Purpose: to add general knowledge to the occurrence of quicksilver deposits in the State of Oregon and to determine if geochemical prospecting can assist prospectors in the search for this mineral. Tentative discussions have been had with Prof. George Tunell, University of California at Los Angeles, on the procurement of Mr. Learned for the summer of 1961. Learned has had previous field experience in New Mexico and Central America and will be on the staff of the New Idria mine this summer and a full-time research assistant collaborating with Professors Dickson and Tunell next year.

(4) Copper in Oregon: (Unit 3 - southwestern Oregon) Project under the direction of George S. Koch, Jr. Initial work will start in 1961. Field work completion date estimated at end of season 1963.

Remarks

State geologic map work is distributed through various projects. Of especial note is the work being done on the copper project in which the Sparta and Baker 1 quadrangles will be mapped in their entirety. Reconnaissance work on the uranium project will be available for the State map as well as the work on the Geology of Central Oregon project. Completion of the reconnaissance mapping of the Dale and Durkee quadrangles is essentially State map work. The stratigraphy and micropaleontology of the Paleozoic rocks are to derive basic information for State geologic map correlation.

Stratigraphic correlations in the Tertiary of central and southeastern Oregon are very difficult due to the scarcity of fossils. So far the Department must rely on vertebrate identifications by Arnold Shotwell of the University of Oregon and identification of fossil leaves by Jack Wolfe of the U.S. Geological Survey. It would be most helpful if more work could be done on diatom identification. Field work in eastern Oregon has revealed that many volcanic tuffs contain diatoms and these are the only fossils to be found over wide areas.

The decision of the Department to stop its micropaleontological work on the Tertiary of western Oregon was influenced by an informal understanding with the Fuels Division of the U.S. Geological Survey that this work would be carried forward by them. The Tertiary micropaleontologist for the Fuels Division has now resigned and is working for the State of Washington Division of Mines and Geology. It could be that this important area of fossil identification will slow down. This would be undesirable as great strides have been made over the last few years.

Tertiary megascopic invertebrate identifications for the Department will continue to be referred to Professor Ewart M. Baldwin of the University of Oregon.

Identification of fossils from the Jurassic and Cretaceous by U.S. Geological Survey personnel has been prompt and extremely helpful. This fine cooperation is of tremendous help to the Department. Identification of fossils from the Triassic has not become too much of a problem as yet but it would be desirable if arrangements could be made to have this work done as promptly as it is for the rest of the Mesozoic.

An area of stratigraphic correlation that should be investigated is the possibility of correlating lava flows through remnant magnetism or like studies. The paleomagnetism work of Donald H. Lindsley in the Spray quadrangle will be awaited with great interest. It would be desirable if a large-scale research program on lava correlation could be established.

SLIDES TO ACCOMPANY NORM PETERSON'S PAPER

(1) Index map - Lakeview uranium area.

(2) Klamath Falls 1/25,000 topographic map

(3) Geologic map - Lakeview uranium area.

(4) Looking west toward Cougar Peak from east of Cottonwood Reservoir.

(5) Drum Hill. Sedimentary tuffs, lake beds, cross-bedding, etc.

(6) Olivine basalt dike, 3' to 4' wide. Along Bavers Creek

(7) Sheep Rock. Columnar jointing, basalt plug - Thomas Creek.

(8) Looking west toward Cougar Peak from Shoestring Lookout.

(9) Headframe at White King mine, Lakeview.

(10) Abandoned shaft.

(11) Lucky Lass open pit. (Perry Halstead, Reno, AEC)

(12) Lakeview Mining Company uranium mill and mine and mill office.

210 tons The State Dept of Geology has in effect a continuing uranium project aimed to both enlighten and encourage the prospector and to determine basic stratigraphic information in areas of possible mineral significance to possibly aid in finding more. This basic info can also be used as needed to fill in gaps in the State Geology map.

OAS Paper

Introduction

Because of the intensive search for and later With the discovery of commercial uranium in Lake County early in 1955 the State Dept. of Geology established a continuing uranium project. During 1955 and 1956 the project was concerned mainly with the examination of radioactive occurrences to enlighten and encourage prospectors. As time permitted reconnaissance mapping to determine basic stratigraphic information in the areas of possible mineral significance has been carried on. This information will also be used to fill in blank areas on the State Geologic map. The White King Mine and the nearby Lucky Lass deposit are so far the only economic occurrences of uranium in Oregon and served as a starting point for reconnaissance and semi-detailed mapping and which will be covered in this report. that was done during the summer field season of 1958 Field Work summer of 1958

Slide #1

Location and extent of the area.

The Lakeview uranium area lies roughly is in southwestern Lake County centered about 20 miles northwest of Lakeview, the county seat. It is in the southern part of the Fremont Mountains just west of the northern edge of the Goose Lake Valley within the Basin and Range physiographic province. Elevations vary from just over 5,000 feet above sea level at the base of the foothills northwest of Goose Lake to 7,925 feet at the top of Cougar Peak. relief of about 3000' Northwest trending fault block ridges are common and generally southeast trending streams drain most of the mapped area. The principal streams are Cottonwood, Thomas, and Augur Creeks. A heavy soil cover and abundant timber is typical throughout the area. A heavy soil cover and abundant timber is typical throughout the area.

General Geology.

The rocks underlying the area are all of Tertiary or Quaternary age

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relief about 3000'

General Geology.

The rocks underlying the area are all of Tertiary or Quaternary age

and consist of a great variety of volcanic rocks and associated ~~lacustrine~~ lake bed deposits.

The oldest rocks ~~are of early Miocene age and~~ consist of a series of indurated light colored acid tuffs, ~~and~~ lithic tuffs, with a minor amount of dark red tuffaceous sedimentary beds. A vertebrate tooth found near the base of this series has been identified by Dr. Arnold Shotwell of U. of Oregon, as being from a "Diceratherium" a rhinoceros of John Day age (lower Miocene). This series may be correlative with a part ~~(upper part)~~ of the Cedarville series as described by Russell in northeastern California. ~~There are at least 2,000 feet~~. These older tuffs are overlain apparently conformably by another group of pyroclastic rocks that are generally less indurated and consist of massive beds of clayey tuffs, pumiceous lapilli tuffs, agglomerates, and a thick section of thin to thick bedded lacustrine ~~deposits~~. The thickness of this group of tuffs is variable and up to 1,000 feet has been measured in one section. The rocks in this group are very easily eroded and do not form conspicuous outcrops.

Fossil leaves have been collected from several localities within the younger tuffs but so far have not been identified.

The younger tuffs are in turn covered by a series of thin to thick olivine basalt flows which have tentatively been correlated with the Pliocene Warner Basalt described by Russell in northeastern California. Their total thickness is variable from 15 feet to at least 800 feet. Two textural types are found one dark, dense, and porphyritic with large feldspar phenocrysts (1" x 1" XLS are common). The other and predominant flow basalt is a light gray open textured "dikty taxitic" variety. Both types are tilted, show columnar jointing and at tops and bottoms are highly vesicular, almost scoriatious in places.

Tr The youngest rocks recognized are light gray, glassy rhyolites that occur occasionally in dike-like masses and ~~most~~ more commonly in conspicuous rounded to cone-shaped hills and elongate ridges. These ~~outcrops are~~ appear to be accumulations of blocks + fragments of platy flow banded rhyolite and are believed to be similar to the cumulo-domes described by Howel Williams in many of his papers on volcanic rocks. Protrusive - effusive - ~~extrusive~~ intrusive -

The highest peak in the area, Cougar Peak, is a good example of this type. It is a cone-shaped peak made up of rhyolitic rubble and perched on a fault block ridge of the older tuffs. The rhyolites quite often occur at the intersections of faults and generally appear to be post-faulting. They ~~do not~~ show ~~the effects~~ only slight effects of erosion and though they are considered to be Pliocene(?) they may be late Pleistocene or even Recent.

Structure

Waring in Water Supply Paper #220 (1908) suggested a major anticline extending from Silver Lake southward through Goose Lake Valley. Field evidence indicates the presence of a rather broad anticlinal fold that trends NW/SE with the axis just to the east of Augur Creek at the south end and generally following Elder Creek to the north. Dips on both ~~sides~~ limbs of the anticline range from 15 to 40 to the SW and NE respectively.

The whole area has been intricately faulted with a greater condentration of faults near the axis of this anticline. — Post basalt

The topography and drainage are controlled by prominent fault sets in 3 directions; N. 45 W., N. 45 E, and N. 15 E. The faults appear to be high angle normal faults with rather small displacements from a few tens up to a few hundred feet in most cases. There are at least 2 exceptions - the fault zone paralleling Mesman Creek where at least 200? feet of the older tuffs are repeated and again along Thomas Creek where there are 2000 feet of

of older tuffs in the upthrown fault scarp and the top of the younger tuffs is exposed on the northeast or downthrown side. The faulting does not appear to be of different ages -- that is one direction does not appear to truncate another direction consistantly but movements ~~that began~~ along the faults probably began contemporaneously in late Tertiary time and have probably continued until the recent.

The White King uranium mine resulted from the discovery of secondary uranium minerals in a surface outcrop at (Slide 2) by Don Tracy of Lakeview. Exploration and development by the Lakeview Mining Co. has proved reserves of about 500,000 tons of uranium ore ~~in the~~ that contains about 0.3% ~~UO2~~ U_3O_8 ~~range~~. Figuring U_3O_8 at about $8.00/lb. this would make the ore worth about 45.00 per ton.

Mineralogy -- A variety of minerals are reported in the ore including coffinite (uranium silicate) sooty pitchblende (powdery black oxide) and the secondary uranyl phosphates and arsenates, autunite, torbernite, and a new mineral Lakeviewite. Associated minerals in the ore include: stibnite, realgar, cinnabar, jordesite, ilsemannite, and galena. Opal and chalcedony is also common in the mineralized area. A preliminary examination of thin sections of the ore indicate the possibility of at least two periods of mineralization -- the first contains the low temperature minerals cinnabar, realgar, stibnite, and opal.. A later period of mineralization is indicated by black primary (?) uranium minerals and galena. Analysis shows that the radioactivity series has not readhed equilibrium indicating a late period of mineralization.

Mineralization appears to be directly related to the intrusive flow banded rhyolite and localization of the mineralization is a result of the concentration of small faults in the mine area.

The ore-body or bodies are contained in a small upfaulted block of

of the younger tuffs and is surrounded on all sides by downfaulted basalt flows. Intrusive rhyolite is found both at the surface and underground in the mine. The ore is found mainly in a massive agglomerate body which is overlain by a clayey finer grained tuff. Rock types are very difficult to recognize underground as they have been highly opalized and in some places completely altered to clay.

Horst
Horst

Later ~~faulting~~ small but numerous faults northwest trending have broken the once tabular orebody into smaller blocks and offset them downward and to the east. Over 30 separate faults in the mine area complicate the geology underground.

If I may take a few minutes more I would like to show just a few slides to show the predominent rock types and the progress of the ~~Silv~~ Oregons only Uranium Mine.

Equilibrium -- A series is said to be in equilibrium when for each decaying parent atom one of each intermediate daughter atoms also decays (on the average). The number of atoms of each intermediate daughter will then be in direct proportion to its halflife T or inverse proportion to the respective decay constant (Lambda). The ultimate (stable daughter) will continue to increase at a decreasing rate.

The State Department of Geology has in effect a
Continuing Uranium project aimed at encouraging and enlightening prospectors and by reconnaissance
and detailed mapping in areas of possible mineralization to determine
both the basic stratigraphic information and mineral association with
the purpose of helping to discover more uranium deposit as needed
The stratigraphic information will also be used to fill in
gaps in the State geologic map.

Location

SW Lake County
20 miles NW of Lakeview
Fremont Mts

GEOLOGY OF THE LAKEVIEW URANIUM AREA, OREGON

The geologic mapping of the Lakeview uranium area was done during the summer field seasons of 1958 and 1959 under the Oregon Department of Geology and Mineral Industries uranium project. The aims of this project were to both enlighten and encourage the prospector as well as to determine basic stratigraphic information in areas of possible mineral significance with the idea that it might lead to additional discoveries of uranium. This basic information may also be used to fill in gaps in the State Geologic Map.

The White King and Lucky Lass deposits of Lake County are the only economic occurrences of uranium so far discovered in Oregon and these deposits served as a starting point for the geologic mapping. Mapping was begun in the vicinity of the uranium occurrences and extended in all directions to cover about 150 square miles.

Location

The Lakeview uranium area is in southwestern Lake County centered about 20 miles northwest of Lakeview. It is in the southern part of the Fremont Mountains just west of the northern edge of the Goose Lake Valley within the Basin and Range physiographic province. Elevations vary from just over 5000 feet above sea level at the base of the foothills northwest of Goose Lake to 7,925 feet at the top of Cougar Peak.

Northwest trending fault block ridges and their parallel streams that drain southeast into Goose Lake are typical of the topography in this part of the Fremont Mountains. Heavy soil cover and abundant timber are common throughout the area.

General Geology

The general area is underlain by a great variety of volcanic rocks of Tertiary and Quaternary age.

Stratigraphy--Older Tuffs

The oldest rocks are a ~~The~~ series of pyroclastic volcanic rocks that have been mapped as Older tuffs. ~~is~~ There are at least 2,000 feet of these tuffs exposed. They are ~~thick and contains~~ indurated light-colored acid to intermediate tuffs, lapilli tuffs, welded tuffs, and a minor amount of dark red tuffaceous sedimentary beds. The color of the tuffs is variable but is mainly tans, greens, ~~and~~ or reddish browns. The older tuffs occur in bold outcrops mainly in northwest trending fault block ridges. They are the most prominent rocks between Cottonwood Creek and Thomas Creek; they also form rugged outcrops along U. S. Highway 66 in Antelope Creek Canyon just west of the Goose Lake Valley.

In the lowest part of the Older tuffs there are about 250 feet of dark-red tuffaceous sedimentary beds. In these ~~xxdx~~ tuffaceous sediments a vertebrate tooth was found. It has been identified by Dr. J. Arnold Shotwell of the University of Oregon as being from a Diceratherium, a rhinoceros of John Day age (lower Miocene). ~~Several~~ Fossil leaves from this same locality have been identified and compared to species in a flora that appears to be of Middle Miocene (Hemingfordian) age by Jack A. Wolfe of the University of California. Wolfe adds that an early or late Miocene age for these leaves would not be impossible.

Even though the lithology appears quite different this series may be correlative with a part of the Cedarville series as described by Russell (1928) in northeastern California. / page 3

Younger Tuffs

The Younger tuffs are another group of highly variable pyroclastic rocks that appear to lie conformably on the Older tuffs. They are generally less indurated and consist of massive beds of clayey tuff, pumice lapilli tuffs, agglomerates, and a thick section of thin to thick bedded

lacustrine sediments. The thickness of this group is variable. As much as 1,000 feet have been measured in one section near the head of Howard Creek in the southwestern part of the area. The rocks in this group are very easily eroded and usually do not form conspicuous outcrops. Fossil leaves were collected from several localities within the Younger tuffs and the one species identified is known elsewhere from late Miocene and earliest Pliocene. There is the possibility that this sequence may also correlate with the Cedarville series of Russell.

Uranium mineralization at the White King Mine occurs in the Younger Tuffs.

Olivine basalt flows

In this rock unit there are basalt flows of two distinct textural types. These textures appear to represent two periods of closely related volcanic activity. The lowermost flows are black porphyritic lavas with occasional to abundant large phenocrysts of labradorite. Crystals 1" x 1" are common. The overlying and most predominant flows are the light gray open-textured diktytaxitic variety of basalt. Flows of both textural types are highly fractured, show rough columnar jointing, and are highly vesicular at tops and bottoms. Total thickness of the flows is variable from a few thin flows a few feet thick to many flows as much as 800 feet thick. Residual fragments and blocks of basalt often form a thin layer of lag material on the easily eroded Younger tuff so that in most cases float cannot be relied upon to indicate the underlying rocks.

The basalt in most cases appears to be conformable to the older rocks but in a few places the contact resembles an old erosion surface. No definite information for dating the basalt flows has been found but their stratigraphic position makes a correlation with the Pliocene

Warner basalt, described by Russell in the northeastern California area.

Basalt and diabase plugs, dikes

Associated with the basalt flows are basalt and diabase dikes, sills, and ~~necks.~~ plugs. These intrusive rocks cut the Older Tuffs and Younger Tuffs. They range in size from 6 inches thick to more than 100 feet and some can be traced for more than a mile. Their composition is very similar to the flows and they are probably the source.

Rhyolite

The rocks shown in red on the geologic map are white to light gray glassy flow-banded rhyolite and dacite. They occur in small to large dike-like masses but more commonly in rounded to cone-shaped hills and domes. These domes appear to be accumulations of blocks and fragments of platy flow-banded rhyolite or dacite. These acid lavas were extruded in such a highly viscid condition that they would not flow but rather disintegrate explosively and while still hot are buried in debris. Cougar Peak is an excellent example of this type. This cone-shaped peak is made up entirely of rhyo-dacite rubble. A cluster of smaller domes are conspicuous just north of Cox Flat. These rocks appear to be in part intrusive and in part extrusive. They generally contain bands and irregular masses of white ashy material and in most cases flow banding is well developed. Perlite selvages are common and locally the rhyolite is partially to completely brecciated and opalized. Cinnabar is common. The age of the rhyolite is not known except that it is post Younger Tuffs. The very slight erosional effects on some of the domes give them the appearance of very young features and they may be of Pleistocene or even Recent age. A small body of flow banded rhyolite occurs at the surface and underground at the White King Mine.

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Structure

Waring (1908) suggested a major anticline extending from Silver Lake

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southward through the Goose Lake Valley. In the course of the present field work, the axis of an anticlinal fold trending about N. 35° W. to to N. 45° W. was found just east of Augur Creek in the northeast part of the map area. Dips on the limbs of the fold range from 15° to 40° to the southwest and northeast. / Page 6

This broad fold has been faulted and the result is a series of homoclinal ridges which show that the influence of the older structure has not been eliminated by the faulting.

Start Structure with this ¶. ~~The~~ faulting is the dominant structural feature, in fact the whole area has been intricately faulted. The topography and drainage are controlled by prominent fault sets in three directions: N. 45° W., N. 45° E., and N. 15° E. The faults all appear to be high-angle normal faults showing rather small displacements ranging from a few tens to a few hundred feet. There are at least two exceptions, however: the fault zone paralleling Mesman Creek where at least 2,000 feet of the Older tuffs are exposed in the upthrown block and the top of the Younger tuff is exposed on the northeast or downthrown side. The faulting does not appear to be of different ages, that is, one direction does not appear to ~~xxxxxxxxxxxx~~ consistently truncate another direction. Movements along the faults probably began contemporaneously in late Tertiary time and have probably continued sporadically up to the present.

Waring (1908) suggested th.

Mineralization

Preliminary reports on the mineralogy and origin of the White King and Lucky Lass deposits by Schafer (1955, 1956) and Peterson (1958) show that the uranium was probably introduced into lapilli tuff and other porous tuff beds of the Younger tuff unit along numerous fault and shear zones as a late phase of the volcanic activity that produced nearby rhyolite dikes and domes. So far, the White King deposit is the only one where primary uranium minerals are found. Black uranium oxide tentatively identified as uraninite, sooty pitchblende, and coffinite (the uranium silicate) are found associated with orpiment, realgar and minor galena, stibnite, pyrite, molybdenum sulfides, and cinnabar. Opalization and clay alteration are prominent in ore bodies especially close to the faults.

A yellow tabular fluorescent secondary uranium mineral occurs at or near the surface in vugs and coating fractures in a brecciated light gray silicified tuff and rhyolite. This mineral a barium uranyl arsenate has recently been described by Gross, Corey, and Mitchell as metaheinrichite.

Although the age of the mineralization has not been determined, bleaching and alteration of basalt flows near the White King Mine and the occurrence of secondary minerals in vesicles of similar flow basalt at the nearby Lucky Lass deposit shows that the mineralization is at least partly post-basalt. This and the association of the mineralization with the rhyolite intrusive-extrusive rocks makes a Pliocene or younger age for the mineralization probable. / Page 7

From the study of the White King deposit there are several structural, lithologic, and mineralogic guides that may be used to indicate a favorable location for uranium mineralization:

1. Areas in which there are intersections of fault zones or a concentration of faults or shear zones.

2. The presence of near-surface intrusive bodies of rhyolite or acid rocks and especially the contact between the glassy flow-banded rhyolite and the Younger tuff unit.

3. Silicified and opalized zones within the rhyolite or Younger rocks of tuff unit.

4. Bleached or heavily iron-stained rock outcrops should be checked for evidence of metallic minerals such as pyrite, cinnabar, or secondary uranium minerals.

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