



Recent	
Qal	Alluvium
Qs	Unconsolidated sediments along stream valleys
Surficial deposits	
Qtb	Undifferentiated colluvium, older alluvium, alluvial-fan, landslide, mudflow, and boulder deposits
Tsl	Basalt
Tsl	Dark-gray finely crystalline vesicular augite-olivine basalt
Salt Lake(?) Formation	
	White-weathering conglomerate consisting of pebbles, cobbles, and boulders of chert, limestone, and sandstone in a light-brown calcareous matrix
ANGULAR UNCONFORMITY	
Jtb	Twin Creek Limestone
Jto	Jtb, Member b, gray and yellowish-gray glauconitic sandstone and sandy limestone; about 300 feet thick; top not exposed
Jta	Member a, pale-brown to yellowish-gray limestone interbedded with reddish-brown shale and siltstone; about 300 feet thick
Jn	Nugget Sandstone
Jn	Pale-reddish-orange thick-bedded to massive fine-grained sandstone, commonly crossbedded; as mapped includes 70 feet of reddish-brown shale and siltstone at top; about 1,000 to 1,500 feet thick
Row	Wood Shale Tongue of Ankerah Formation
Row	Reddish-orange to reddish-brown shale, siltstone, and sandstone; about 210 feet thick
Rdl	Deadman Limestone
Rdl	Reddish-brown shale and siltstone; thin limestone beds at top and base and light-gray resistant cherty limestone in middle; about 280 feet thick
Rh	Higham Grit
Rh	Massive ledge-forming gray, pink, buff, and green conglomeratic sandstone; locally mottled red and purple; about 200 to 250 feet thick
Rtpu	Thaynes Formation
Rtpu	Rtt, Timothy Sandstone Member, buff to gray glauconitic sandstone with maroon sandstone interbedded with maroon and pale-green shale and siltstone at base; about 230 feet thick
Rtpu	Upper part of Portneuf Limestone Member, yellowish-gray to yellowish-brown sandstone, siltstone, and shale at base overlain by gray to dark-gray limestone with some interbedded shale, siltstone, and sandstone; about 250 to 290 feet thick
Rtl	Lanes Tongue of Ankerah Formation
Rtl	Thin-bedded reddish-brown to red sandstone interbedded with reddish-brown shale and siltstone; about 500 feet thick
Rtl	Thaynes Formation
Rtl	Rtpl, lower part of Portneuf Limestone Member, massive gray limestone, generally cliff forming, and minor amounts of gray sandstone and siltstone; about 300 to 400 feet thick
Rtl	Rtn, nodular siltstone member, olive- to brownish-gray siltstone and shale containing small dark-gray limestone nodules; interbedded with yellowish-brown sandstone and gray limestone in upper part; about 400 feet thick
Rtl	Rtb, black shale member, gray to black fissile shale with a few thin dark-gray limestone beds near base and top; about 280 feet thick
Rtl	Rts, platy siltstone member, thin-bedded yellowish-brown to olive-gray calcareous platy siltstone; some interbedded olive-gray shale and nodular gray limestone; about 650 to 750 feet thick
Rtl	Rtl, black limestone member, blocky gray to black resistant limestone, weathers gray to bluish gray; some interbedded black shale and siltstone near middle and top; <u>Megaceras</u> fauna at base; about 550 feet thick
Rd	Dinwoody Formation
Rd	Thin-bedded olive-gray shale and siltstone at base grades upward to medium-bedded olive-gray, black-weathering siltstone in lower half; overlain by interbedded gray limestone and olive-gray shale and siltstone with medium-bedded gray limestone predominant in upper part; about 1,700 to 2,200 feet thick
Ppc	Phosphoria Formation
Ppc	Ppc, cherty shale member, thin-bedded dark-brown to black cherty sandstone, mudstone, siliceous shale, and argillaceous chert; about 170 feet thick
Ppr	Ppr, Rex Chert Member, thick-bedded black to white, usually gray to bluish-gray chert and minor amounts of mudstone; locally contains lenses of gray limestone near base and top; ledge-forming; about 80 feet thick
Ppm	Ppm, Meade Peak Phosphatic Shale Member, phosphorite, mudstone, and minor amounts of limestone; thin-bedded, gray to black and brown, phosphorite commonly oolitic or pisolitic; thick high-grade phosphorite zones near base and top; scale-forming; about 110 to 180 feet thick
Pps	Grandeur Tongue of Park City Formation
Pps	Light-gray dolomite and cherty dolomite and minor amounts of sandstone; small silicified brachiopods prominent in upper part; ledge-forming; about 100 feet thick
Ppwu	Wells Formation
Ppwu	Ppwu, upper member, gray fine-grained sandstone that weathers reddish brown to buff and some interbedded gray limestone and dolomite which is locally cherty; distinctive ledge-forming crossbedded light-gray-weathering sandstone bed about 400 feet above base overlies fusilind-bearing limestone bed; contains red beds in uppermost 200 to 300 feet; about 1,350 to 1,450 feet thick
Pwl	Pwl, lower member, gray sandy limestone, commonly cherty and oolitic, interbedded with some fine-grained calcareous buff to gray sandstone; flattened oolites characteristic; contains nodules and lenses of concentrically bedded chert; 2-inch-thick nodular phosphorite found locally about 100 feet below top; fossiliferous in upper part; cliff-forming; about 850 to 950 feet thick
Mb	Brazer Limestone
Mb	Thick-bedded light-gray limestone, some gray and green shale in lower part; locally cherty and massive; contains large horn corals and brachiopods near and at top; about 800 feet thick; base not exposed

EXPLANATION

Contact

Long dashed where approximately located; short dashed where inferred; dotted where concealed; queried where doubtful

Fault

Long dashed where approximately located; short dashed where inferred; dotted where concealed; queried where doubtful; U, upthrown side; D, downthrown side; arrows show relative horizontal movement

Thrust fault

Long dashed where approximately located; short dashed where inferred; dotted where concealed; queried where doubtful

Anticline, showing crestline

Long dashed where approximately located; short dashed where inferred; dotted where concealed; queried where doubtful

Syncline, showing troughline

Long dashed where approximately located; short dashed where inferred; dotted where concealed; queried where doubtful

Overturned syncline, showing direction of dip of limbs

Long dashed where approximately located; short dashed where inferred; dotted where concealed; queried where doubtful

Strike and dip of beds

Strike and dip of overturned beds

Strike of vertical beds

Horizontal beds

Portal of adit

Phosphate trench

1232, 1233, 1256, and 1259 are lot numbers of USGS sampling-program trenches

Prospect pit

Gravel pit

Standard Oil Co. of Calif. Federal 1 7868

Oil and gas well, dry hole, showing total depth

\* r21833

Fossil locality

U.S. Geological Survey fossil collection

ECONOMIC GEOLOGY

The most important mineral commodity found in the Upper Valley quadrangle is phosphate in the Meade Peak Phosphatic Shale Member of the Permian Phosphoria Formation. The phosphate, composed of carbonate fluorapatite minerals, occurs as nodules, pellets, and blocky (tabular) deposits in beds and units throughout the Meade Peak Member; however, phosphatic intervals of economic importance are located mainly in the basal and upper parts of the member. Data from Geological Survey sample localities, within and adjacent to the quadrangle, show that cumulative thicknesses of intervals of high-, medium-, and low-grade phosphate rock range as follows (only intervals 3 or more feet thick are included): high-grade (31+ percent P<sub>2</sub>O<sub>5</sub>), 10 to 20 feet; medium-grade (24+ percent P<sub>2</sub>O<sub>5</sub>), 30 to 60 feet; and low-grade (18+ percent P<sub>2</sub>O<sub>5</sub>), 55 to 117 feet. For calculations of any one grade cutoff, no bed was used more than once, but the same bed may be averaged with adjacent beds for different grades. Along most of Dry Ridge, Ramussen Ridge, and the west side of Dry Valley the Meade Peak Member crops out on dip slopes in such a manner that large tonnages of phosphate rock can be strip mined. Large areas of the surface outcrop of the Meade Peak are presently under Federal phosphate leases and prospecting permits. The El Paso Natural Gas Products Co. started strip-mining operations in 1965 on a Federal lease on Dry Ridge in the W<sub>4</sub> sec. 3, T. 8 S., R. 44 E. The phosphate rock is shipped by railroad to a mill near Conda, Idaho, for processing.

The only oil and gas test in the quadrangle was drilled by the Standard Oil Co. of California (now Chevron Oil Co.) in 1952. The dry hole, located in the NE<sub>1/4</sub> sec. 32, T. 7 S., R. 44 E., and started in the Brazer Limestone, encountered a complexly folded and faulted sequence and tested rocks probably as old as the Madison Limestone of Mississippian age. No shows of oil or gas were reported.

Rock from the cherty shale member of the Phosphoria Formation and basalt have been used for road metal in this region. Both resources are abundant within the quadrangle.

SELECTED REFERENCES

Armstrong, F. C., and Cressman, E. R., 1963, The Bannock thrust zone, southeastern Idaho: U.S. Geol. Survey Prof. Paper 374-J, p. 1-22.

Cressman, E. R., 1956, Geology of the Georgetown Canyon-Snowdrift Mountain area, southeastern Idaho: U.S. Geol. Survey Bull. 1153, 105 p.

Cressman, E. R., and Gulbransen, R. A., 1955, Geology of the Dry Valley quadrangle, Idaho: U.S. Geol. Survey Bull. 1015-I, p. 237-370.

Gulbransen, R. A., McLaughlin, K. P., Honkala, F. S., and Claiborne, S. E., 1956, Geology of the Johnson Creek quadrangle, Caribou County, Idaho: U.S. Geol. Survey Bull. 1062-A, p. 1-23.

Isley, R. W., 1953, Characteristics of the Jurassic Twin Creek Limestone in Idaho, Wyoming, and Utah, in Inter-mountain Assoc. Petroleum Geologists 4th Ann. Field Conf., Guide to the geology of northern Utah and southern Idaho, 1953: p. 54-62.

Kummel, Bernhard, 1954, Triassic stratigraphy of southeastern Idaho and adjacent areas: U.S. Geol. Survey Prof. Paper 254-II, p. 165-194.

Mansfield, G. R., 1927, Geography, geology, and mineral resources of part of southeastern Idaho: U.S. Geol. Survey Prof. Paper 122, 409 p.

McKelvey, V. E., Armstrong, F. C., Gulbransen, R. A., and Campbell, R. M., 1953, Stratigraphic sections of the Phosphoria formation in Idaho, 1947-48, Pt. 2: U.S. Geol. Survey Circ. 301, 58 p.

O'Malley, F. W., Davidson, D. F., Hoppin, R. A., and Sheldon, R. E., 1953, Stratigraphic sections of the Phosphoria formation in Idaho, 1947-48, Pt. 3: U.S. Geol. Survey Circ. 262, 43 p.

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards.

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Base by U.S. Geological Survey, 1949

Geology mapped in 1958-59

Cross sections A-A' and B-B' are omitted from this preliminary map

SCALE 1:20,000

QUADRANGLE LOCATION

PRELIMINARY GEOLOGIC MAP OF THE UPPER VALLEY QUADRANGLE, CARIBOU COUNTY, IDAHO

By

Robert L. Rioux, Robert J. Hite, John R. Dyni, and Willard C. Gere

1966