



PRELIMINARY
GEOLOGIC MAP OF THE CAMP DAVIS QUADRANGLE, TETON COUNTY, WYOMING

CORRELATION OF MAP UNITS						
Qal	Qc	Qt	Ql	Qlg	Qf	Qls
HOLOCENE						
QUATERNARY						
Tertiary						
Pliocene(?)						
Upper Cretaceous						
Lower Cretaceous						
Upper Jurassic						
Upper and Middle Jurassic						
Jurassic(?) and Triassic(?)						
Upper Triassic						
Lower Triassic						
Permian						
Pennsylvanian						
Mississippian						
Upper and Lower Mississippian						
Upper and Middle Devonian						
Devonian						
Upper Ordovician						
Ordovician						

DESCRIPTION OF MAP UNITS	
Qal	Alluvium
Qc	Colluvium
Qt	Talus
Ql	Loess
Qlg	Terrace deposits
Qf	Alluvial-fan deposits
Qls	Landslide deposits and mudflows
GYPSUM DEPOSITS (TERTIARY)-- Present only in two small light-brown vuggy deposits at mouth of Hoback Canyon near Skinking Springs	
CAMP DAVIS FORMATION (PLIOCENE?)	
Tcu	Upper part-- Consists of: upper unit, well-consolidated calcareous red conglomerate that contains abundant Triassic sandstone and siltstone derivatives in its lower part; Paleozoic and granite fragments become more abundant upward; forms cliffs in Horse Creek area; about 4,000 feet thick. Middle unit, poorly consolidated red conglomerate interbedded with dark-reddish-brown silty and sandy mudstone; poorly exposed; about 1,000 feet thick. Lower unit, massive sequence of white to light-pink limestone, conglomerate, mudstone, tuff, pumice, and diatomite; about 200 feet thick. Total thickness about 5,200 feet
Tcl	Lower part-- Well-cemented light-brownish-gray well-rounded to subangular conglomerate that contains predominantly limestone and dolomite pebbles in a light-pinkish calcareous sandy matrix; forms prominent cliffs; about 250-300 feet thick
Kf	FRONTIER FORMATION (UPPER CRETACEOUS)-- Interbedded nonresistant gray to light-brown silty shale, black silty shale, and massive yellowish-brown fine-grained calcareous sandstone; contains well-preserved leaves and silicified wood; 1,200 feet thick, upper part not present in quadrangle
Kau	ASPER FORMATION (LOWER CRETACEOUS)-- Gray and greenish-gray siltstone and salt-and-pepper sandstone; contains interbedded, isolated porcellanite; about 1,200-1,300 feet thick east of Darby thrust. Upper part (Kau) separated from lower part (Kal) by distinctive porcellanite marker bed (p)
Kb	BEAR RIVER FORMATION (LOWER CRETACEOUS)-- Black to dark-gray hard splintery siliceous shale in upper and lower parts. Massive gray cross-bedded tan-weathering sandstone in middle part forms prominent ridges and cliffs; contains some carbonaceous shale interbeds. Puccin markings common in fine-grained rusty-weathering sandstone associated with olive-gray siltstone in lower 10 feet. About 300 feet thick. m, top of Muddy Sandstone Member of Thermopsis Shale as mapped east of the thrust belt
kg	GANNETT GROUP, UNDIFFERENTIATED (LOWER CRETACEOUS)-- Irregularly hematitic-red shale and siltstone; contains some quartzitic sandstone; base is a massive coarse-grained sandstone; uppermost part contains light-gray and reddish-purple to brownish-red fine-grained silty limestone. About 500 feet thick
Js	STUMP AND PREUSS SANDSTONES (UPPER JURASSIC)-- Stump Sandstone, greenish to brownish-gray cross-bedded fine to medium-grained calcareous glauconitic sandstone. Preuss Sandstone, red shaly sandstone and siltstone. About 200 feet thick
Jc	TWIN CREEK LIMESTONE (UPPER AND MIDDLE JURASSIC)-- Light-gray fine-grained limestone and shaly limestone that weathers into splinters; approximately the lowermost 100 feet is correlative to the Gypsum Spring Formation of central Wyoming; 750-800 feet thick
Jm	NUGGET SANDSTONE (JURASSIC? AND TRIASSIC?)-- Light-tan to reddish-orange very fine grained ridge-forming quartz sandstone; 350-400 feet thick
Bc	CHUGWATER FORMATION (UPPER AND LOWER TRIASSIC)-- Interbedded red shale, siltstone, and sandstone; contains silty gray dolomite in uppermost part and fine-grained gray to purplish-red limestone near middle; about 1,000-1,200 feet thick
lw	WOODSIDE FORMATION (LOWER TRIASSIC)-- Interbedded red shale, siltstone, and sandstone; equivalent to lower part of Chugwater Formation; about 500 feet thick
kl	DINWOODY FORMATION (LOWER TRIASSIC)-- Light-brownish-gray siltstone, sandstone, and shale interbedded with thin bluish-gray limestone beds; about 300-350 feet thick
PHOSPHORIA FORMATION AND EQUIVALENT UNITS (PERMIAN)	
Pp	Phosphoria Formation and equivalent units undifferentiated
Ppu	Upper part-- Includes Retort Phosphatic Shale Member of Phosphoria Formation, Hedborn Sandstone, Rex Chert Member of Phosphoria Formation, and Franson Member of Park City Formation; about 190 feet thick
Ppm	Meade Peak Phosphatic Shale Member of Phosphoria Formation-- Nonresistant thin-bedded dark unit of phosphorite, mudstone, and carbonate rock; about 45 feet thick
PPMw	WELLS FORMATION AND ASSOCIATED ROCKS (PERMIAN, PENNSYLVANIAN, AND MISSISSIPPIAN)-- Upper part: light-gray, pink, and white quartzitic sandstone and some interbedded fine-grained light-gray limestone and dolomite; forms prominent outcrops and coarse talus; the lower Permian Grandeur Tongue of Park City Formation mapped with the upper few feet. Lower part: predominantly red argillaceous shale and gray limestone; contains a prominent iron-stained quartzitic sandstone in basal part; in part correlative to the Maden Formation. About 500-1,000 feet thick
Mm	MADISON GROUP, UNDIVIDED (UPPER AND LOWER MISSISSIPPIAN)-- Light- to dark-gray fine- to coarse-grained massive to thin-bedded bioclastic limestone. Upper part equivalent to the Mission Canyon Limestone; lower part equivalent to the Lodgepole Limestone. About 1,600 feet thick
Dd	DARBY FORMATION (UPPER AND MIDDLE DEVONIAN)-- Nonresistant yellowish-brown thin-bedded dolomitic siltstone in upper part; interbedded brownish-gray to dark-brown fine- to medium-grained dolomite and limestone in lower part; about 400-450 feet thick, base not exposed
Ob	BIGHORN DOLOMITE (UPPER ORDOVICIAN)-- White to light-gray fine- to medium-grained massive slightly calcareous dolomite. Shown in cross section only
Contact-- Dashed where approximately located; short dashed where inferred; dotted where concealed	
Fault-- Dashed where approximately located; dotted where concealed. U, upthrown side; D, downthrown side	
Gravity fault-- Marks slip surface of large blocks of rocks of Mesozoic age moved by gravity and incorporated within Camp Davis Formation; dotted where concealed	
Slump fault-- Dotted where concealed; hachures on downthrown side	
Tectonic fault-- Dashed where approximately located; dotted where concealed. Sawtooth on upper plate	
Anticline-- Showing crestline and direction of plunge. Dashed where approximately located; dotted where concealed	
Syncline-- Showing troughline. Dashed where approximately located; dotted where concealed	
Strike and dip of beds	
Strike and dip of overturned beds	
Strike of vertical beds	
CP-70 Phosphate trench	

ECONOMIC GEOLOGY

The quadrangle was mapped as part of the U.S. Geological Survey program of classifying and evaluating mineral lands in the public domain. Resources of economic interest are phosphate rock, sand and gravel, limestone, and road metal.

The phosphate-bearing Phosphoria Formation crops out near the Snake River in the southwestern part of the quadrangle and in the higher mountainous part of the Horse Creek drainage area in the northeastern part. Phosphate rock is found in the Retort Phosphatic Shale Member at the top of the Phosphoria and in the Meade Peak Phosphatic Shale Member at the base; the phosphate-bearing beds are thicker and generally of higher grade in the Meade Peak. The Phosphoria was measured and sampled (Cere and others, 1966) in the SW_{1/4} sec. 24, unsurveyed, T. 40 N., R. 116 W., north of the map area, where the Meade Peak is about 48 feet thick and the Retort is about 28 feet thick. The upper 4.6 feet of the Retort assayed 18.4 percent P₂O₅; the lower 1.0 foot assayed 24.2 percent P₂O₅. The basal 5 feet of the Meade Peak assayed 23.3 percent P₂O₅, which is the thickest relatively high grade phosphate rock trench. A bed 1.0 foot thick at the base of this 5-foot zone assayed 31.7 percent P₂O₅. In 1971 phosphate rock had not been mined in this area.

Sand and gravel are readily available along the Snake and Hoback Rivers and their major tributaries. Relatively pure limestone is abundant and accessible from the upper part of the Madison Group. Road metal can be obtained from the upper part of the Wells Formation where it is accessible in the eastern part of the quadrangle.

Although no drilling has been done in the quadrangle for oil and gas, the area is considered of exploratory interest because of the thick sedimentary sequence.

REFERENCE CITED

Cere, W. C., Schell, E. M., and Moore, K. P., 1966, Stratigraphic sections and phosphate analyses of Permian rocks in the Teton Range and parts of the Snake River and Gros Ventre Ranges, Idaho and Wyoming: U.S. Geol. Survey open-file report, 71 p.

TABLE 1.--Chemical analyses of the Retort and Meade Peak Phosphatic Shale Members of the Phosphoria Formation

[Cane Creek trench (USGS Lot No. CP-12), SW_{1/4} sec. 24, unsurveyed, T. 40 N., R. 116 W. Described and sampled by E. M. Schell and W. C. Cere; analyses by K. P. Moore. Brackets indicate the two richest P₂O₅ zones sampled]

Rock description	Thickness (ft)	Analyses (percent)			Acid Insoluble (percent)
		P ₂ O ₅	U ₂ O ₃	Cr ₂ O ₃	
Retort Member (top).					
Sandstone, phosphatic-----	2.0	17.05	-----	-----	45.26
Phosphorite, sandy, argillaceous-----	2.6	19.50	-----	-----	39.75
Mudstone, calcareous-----	2.5	-----	-----	-----	-----
Base of trench-----	-----	-----	-----	-----	-----
Concealed, mudstone float-----	21.0	-----	-----	-----	-----
Top of trench-----	-----	-----	-----	-----	-----
Phosphorite, sandy-----	1.0	24.22	-----	-----	28.26
Total-----	29.1	-----	-----	-----	-----
Meade Peak Member (top).					
Phosphorite, calcareous, cherty-----	1.6	-----	-----	-----	-----
Mudstone, phosphatic, silty-----	0.1	14.35	-----	-----	46.90
Mudstone, phosphatic-----	0.6	-----	-----	-----	-----
Mudstone, silty-----	1.7	0.00	-----	-----	86.18
Mudstone, silty-----	0.4	0.00	-----	-----	85.85
Mudstone, silty-----	0.8	-----	-----	-----	-----
Phosphorite, argillaceous-----	0.6	17.07	0.05	0.09	37.07
Mudstone, silty-----	0.6	-----	-----	-----	-----
Base of trench-----	-----	-----	-----	-----	-----
Concealed-----	31.8	-----	-----	-----	-----
Top of trench-----	-----	-----	-----	-----	-----
Carbonate rock, argillaceous-----	1.2	0.09	0.39	0.07	21.08
Mudstone, carbonatic-----	0.8	2.01	-----	-----	50.91
Mudstone, calcareous, and phosphatic-----	2.7	8.65	-----	-----	21.35
Phosphorite-----	1.5	25.75	-----	-----	10.19
Carbonate rock-----	0.4	6.11	-----	-----	8.95
Phosphorite-----	1.4	30.10	-----	-----	2.27
Siltstone-----	0.7	2.53	-----	-----	68.03
Phosphorite-----	1.0	31.75	-----	-----	2.15
Base of trench-----	-----	-----	-----	-----	-----
Total-----	47.9	-----	-----	-----	-----

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