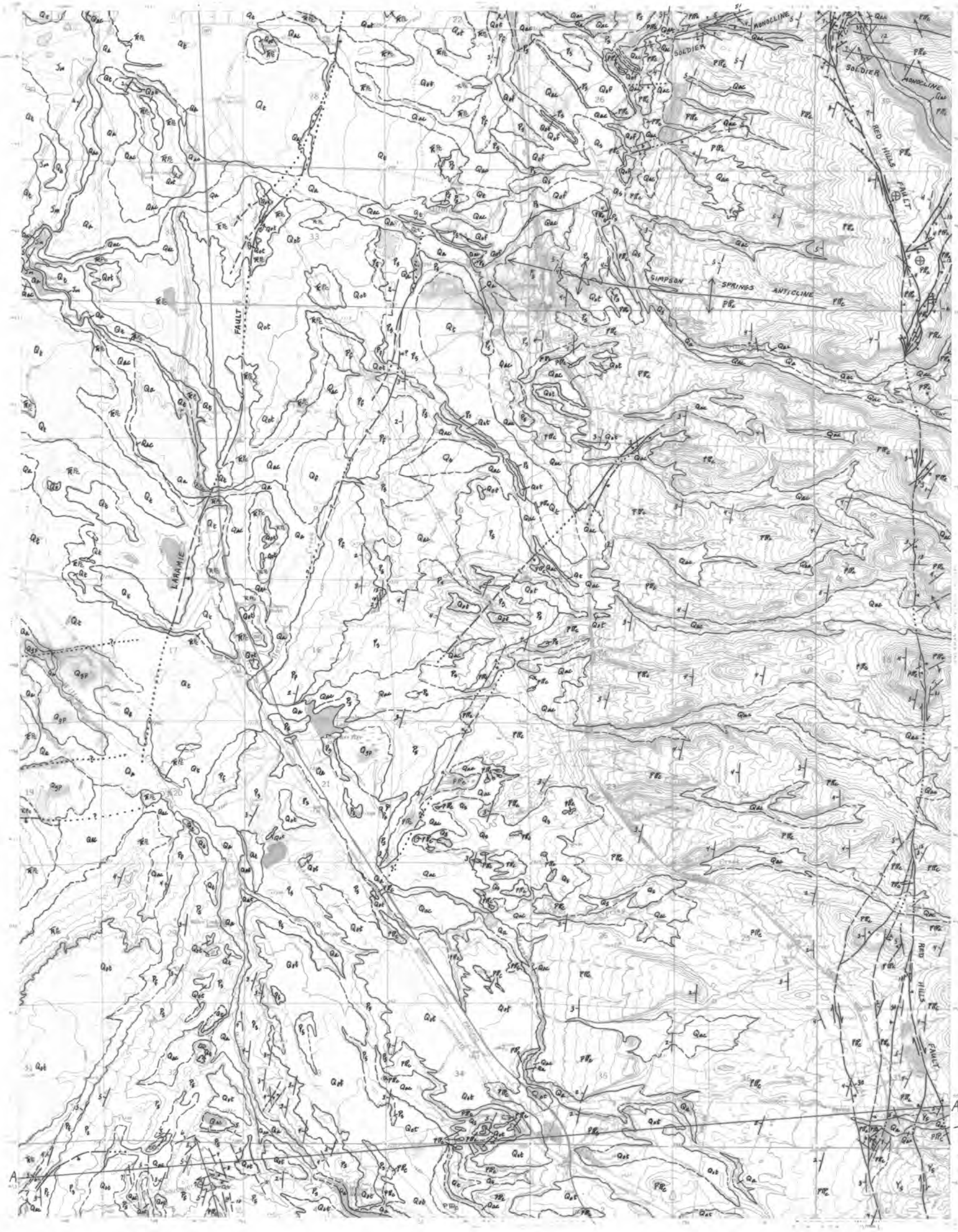
WYOMING STATE GEOLOGICAL SURVEY
Gary B. Glass, State Geologist

PRELIMINARY GEOLOGIC MAP 95-2
Red Buttes Quadrangle
Albany County, Wyoming



EXPLANATION

SEDIMENTARY AND PRECAMBRIAN ROCKS AND SURFICIAL DEPOSITS

Qa **Alluvial deposits**
Unconsolidated and poorly consolidated clay, silt, sand, and gravel, mainly in floodplains and lowest stream terraces. Thickness 0 to 20 feet.

Qac **Mixed alluvium and colluvium**
Sand, silt, clay, and gravel deposited mainly along intermittent streams; includes slope wash and smaller alluvial fan deposits that coalesce with alluvium. Thickness approximately 0 to 20 feet.

Qat **Mixed alluvium and terrace deposits**
Unconsolidated and poorly consolidated clay, silt, sand, and gravel, representing a transition zone between alluvium and terrace deposits; small occurrence along Willow Creek, in the southern part of the map. Thickness approximately 0 to 15 feet.

Qs **Windblown sand deposits**
Active and stabilized dunes, made up of very fine-to fine-grained sand. Although numerous unmapped small-scale examples occur within the map area, mapped examples occur at the mouth of Gilmore Gulch and southeast of Red Buttes in the Red Buttes housing developement. Thickness approximately 0 to 15 feet.

Qf **Alluvial fan deposits**
Poorly sorted clay, silt, and gravel; crudely bedded to nonbedded. Appear to be active receiving sediments from intermittent stream. May have some debris flow component. Only occurrence is on a relatively small scale northeast of Red Buttes. Thickness 0 to 30 feet.

Qt **Terrace deposits**
Beds of coarse sand and gravel with occasional boulders and lenses of silt and clay. Includes fragments of weathered granite and limestone cobbles, predominance varies depending on feeding stream source. Occur along present drainages, a few feet to over 15 feet above modern flood plains. Thickness approximately 0 to 10 feet.

Qgp **Gypsite deposits**
Unconsolidated clay-sized gypsum interbedded with red clay, sand, gravel, and limestone cobbles. Located in stream valleys immediately west of the Laramie Fault, probably related to erosion of gypsum beds of the lower Formation which were brought to the surface or near surface by the Laramie Fault. Thickness approximately 0 to 20 feet.

Qof **Older alluvial fan deposits**
Poorly sorted clay, silt, sand and gravel; crudely bedded to nonbedded with some debris flow component. Limestone cobbles are common. Currently inactive and dissected, often occurring as erosional remnants. Grade into older terrace deposits toward the west, in the northern part of the map area. Thickness 0 to 20 feet.

Qot **Older terrace deposits**
Beds of coarse sand and gravel with occasional boulders and lenses of silt and clay. Limestone cobbles are common. Often occur as erosional remnants ranging from 20 to 40 feet above present stream floodplains. Some remnants may actually be older alluvial fan remnants. Thickness 0 to 10 feet.

UNCONFORMITY

Twr? **White River Formation? (Oligocene)**
Mostly unconsolidated, light gray sand and silt interbedded with lenses of gravel and cobbles composed of limestone and sandstone eroded from outcrops of Casper Formation, as well as, igneous and metamorphic cobbles from the Precambrian outcrops to the east. Outcrops occur in Gilmore Gulch on the east edge of the map. Additional work is required to definitively establish the age of these deposits. Thickness 0 to nearly 100 feet.

UNCONFORMITY

Jm **Morrison Formation (Upper and Middle Jurassic)**
Pale-green, olive-green, blue-green to maroon and chalky white variegated calcareous and bentonitic claystones interbedded with thin drab limestones and buff, non-resistant sandstones. Limestone, locally, contains orange to brown chert inclusions. A thin section of Sundance Formation may exist in the area, but due to few and poor exposures and questionable indentification, it is mapped with the Morrison. Thickness 300 to 400 feet.

UNCONFORMITY

TRPc **Chugwater Formation (Triassic and Permian)**
Red shale and siltstone with interbedded red to salmon to buff, fine-grained sandstone. Lower portion of section contains red shale interbedded with thin to thick gypsum beds and banded wavy gypsiferous thin limestone and associated solution breccia, sometimes mistaken for part of the Forelle Limestone. This portion of the Chugwater along with the underlying Forelle Limestone and Santanka Shale would be mapped as Goose Egg Formation, west of the Laramie Basin. Locally, some possible Jelm Formation sandstone erosional outliers may occur, but due to their lack of persistence and questionable indentification, they are mapped with the Chugwater. One example of possible Jelm Formation occurs east of Harney Creek in Sec 29, T.15N., R.73W. Thickness 650 to 800 feet.

Pf **Forelle Limestone (Permian)**
Gray to purple, thin bedded, sparsely fossiliferous limestone locally interbedded with red siltstone and thin gypsum laminations and associated solution breccia. Wavy outcrops resembling algal structures common. Thickness 10 to 30 feet.

Ps **Satanka Shale (Permian)**
Red siltstone and shale (often banded with white and ocher color zones), soft sandstone, thin limestones, and local gypsum beds, especially near the top. Buff to orange to red, fine-grained sandstone with ripple marks common near base of unit. Gypsum beds in the Satanka are currently being mined south of Red Buttes. Thickness 140 to 200 feet.

UNCONFORMITY

PIPc **Casper Formation (Permian and Pennsylvanian)**
Buff to reddish, calcareous to quartzitic, fine- to coarse-grained, well cemented subarkosic sandstone interbedded with thin buff to purplish-gray limestone and dolomite beds, usually micritic and locally fossiliferous. Sandstone often exhibits large-scale festoon cross-bedding, increasing toward the south. The limestone beds are quite thin and less numerous than in the Laramie area and are for the most part absent in the southern part of the map area. The Casper Formation serves as the prime aquifer in the map area. Intertongues with underlying Fountain Formation, which is up to 400 feet thick in the map area and includes primarily maroon arkosic cross-bedded fine to coarse sandstone and conglomerate interbedded locally with shales and thin limestones. They are mapped together due to the transitional nature of the contact between the Casper and the Fountain. Thickness 600 to 800 feet.

UNCONFORMITY

Ys **Sherman Granite (Middle Proterozoic)**
Coarsely crystalline pink granite ranging in age from 1,414 to 1,435 Ma. Crops out in the southeast corner of the map area.

MAP SYMBOLS

Formation contact
Dashed where approximately located.

Fault
Dashed where approximately located, dotted where concealed. Bar and ball on downthrown block; arrows indicate relative direction of oblique-slip movement.

Anticline
Trace of axial plane and direction of plunge determined by field dip measurements and by photo interpretation. Dashed where approximately located.

Monocline
Trace of axial plane as determined by field measurements and by photo interpretation. Dashed where approximately located. Short arrow denotes steeper dipping limb.

Strike and dip of beds, showing angle of dip

Horizontal beds

Strike and dip measurements from Lundy (1978) and Nicoll (1963)

Cross section location

REFERENCES

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Lundy, D.A., 1978, Hydrology and geochemistry of the Casper aquifer in the vicinity of Laramie, Albany County Wyoming: M.S. thesis, University of Wyoming, Laramie, 76 p., figure 3, scale 1:28,800.

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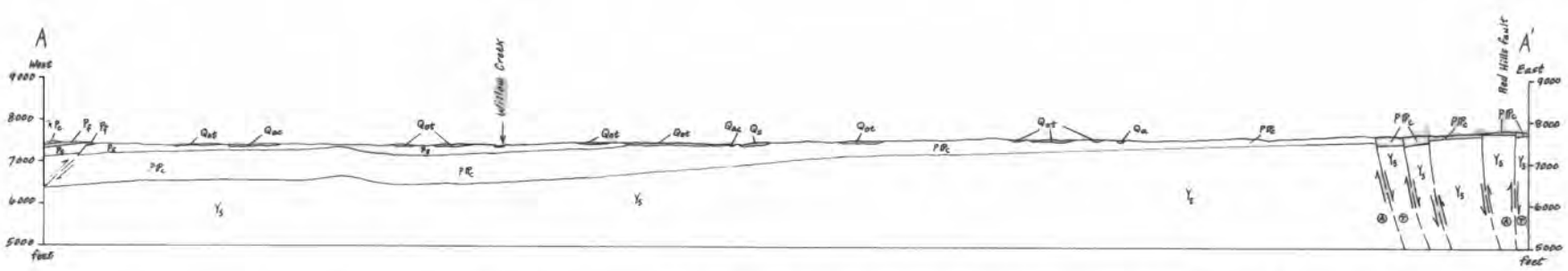
This map has not been edited for conformity with the editorial standards of the Wyoming State Geological Survey. This work was partially funded with support from the Wyoming State Geological Survey general operating budget and by U.S. Geological Survey STATEMAP Award No. 1434-94-A-1262. The views and conclusions expressed on this map are those of the author and should not be interpreted as necessarily representing official policies, either expressed or implied, of the U.S. government.



PRELIMINARY GEOLOGIC MAP OF THE RED BUTTES QUADRANGLE, ALBANY COUNTY, WYOMING

by
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1995