6000 0303 (5220)

UNIVERSITY OF NEVADA
MACKAY SCHOOL OF MINES
RENO, NEVADA 89507

Nevada Bureau of Mines

April 18, 1968

Mr. Roger Hope
U. S. Geological Survey
Southwestern Branch
Geologic Division
345 Middlefield Road
Menlo Park, California 94025

Dear Mr. Hope:

I have finished my field work in my thesis area and plan to graduate this June. However, I am presently employed by the Nevada Bureau of Mines and would be available to get together with you sometime this summer. Perhaps I could write you later to arrange a time in the field which would be convenient for both of us. I am very much interested in seeing more of the geology surrounding my mapping area.

I have enclosed a copy of my map, the cross sections, and xerox copies of the described sections. The column accompanying the map has the two volcanic units in reverse order, but is otherwise correct. I feel reasonably certain of the pattern of the stratigraphic units I have mapped, but less certain regarding the nature of contacts which I believe to be faults. Hopefully, a more regional approach, such as your study, may resolve some of these problems.

Thicknesses for the Devonian and Tertiary sediments are given in the enclosed sections; the Diamond Peak(?) is at least 3,500 feet and the rocks called Phosphoria by Steele (Ph.D. thesis 1959, Univ. Wash., p. 176) are as much as 5,000 feet thick. The Tertiary volcanic units are each less than 100 feet thick.

I have been corresponding with Ben Peterson and Douglas Gardner from the University of Oregon (Eugene) and understand that they have been mapping just north of my thesis area (Antelope Peak, etc.). If you are not aware of their work, this may be of interest to you.

If I can be of any further assistance, please write or come in person at any time. If you pass through Reno and have some free time I will be happy to talk with you.

Sincerely yours,

Larry Garside

Larry J. Garside
Economic Geologist

LJG:hm

Stratigraphic Section of Tertiary Sediments

Measured 1 1/2 miles north of Sulphur Hot Spring

Fault contact with Diamond Peak(?) Formation

Thickness in Feet		Unit	
Unit	To Base	No.	
50	5252	24	Red and tan weathering coarse grained sandstone with angular and sub-angular grains of quartz and red chert.
55	5202	23	Reddish weathering conglomerate containing sub-angular to sub-rounded pebbles of Diamond Peak(?) conglomeritic quartzite and red or yellow chert. The matrix is red weathering, buff, medium-grained sand, and the pebbles range from sand-size to 2 1/2 in. in diameter. In some exposures, red conglomeritic sandstone interbeds up to 5 in. thick are seen. This unit is siliceously cemented and often is so dense that pebbles will break across rather than around. The weathered rock surface is quite rough due to projecting pebbles.
35	5147	22	Fine- to very fine-grained, buff to cream colored, platy weathering sandstone. The unit is slightly calcareous and may be cemented with both calcite and silica. It is not so well cemented as the sandstones in unit 23,

Thickness in Feet		Unit
Unit	To Base	No.	
35	5147	22	and can be broken easily. The sand grains are approximately 50 percent quartz, with the rest being mostly red and yellow chert. A small proportion of the rock is probably in the silt-size range.
615	5112	21	Conglomerate like unit 23 but containing pebbles of a light grey or white fine-grained quartzite as well as fragments of Diamond Peak(?) Formation and fine-grained chert. At 250 feet above the base of this unit it becomes much coarser, with sub-rounded cobbles up to 10 in by 6 in. not uncommon. In this portion pebbles and cobbles of the following are seen: light tan rhyolite with phenocrysts of biotite and feldspar, altered green rhyolite(?) with plagioclase laths, grey quartzite, Diamond Peak(?) conglomeritic quartzite, dark reddish-yellow chert, and a light tan rhyolite with large quartz phenocrysts. This cobble portion continues for 200 feet and then the unit becomes less coarse, with the pebbles ranging up to 4 in. in diameter. The matrix and sand interbeds are also similar to unit 23.

Thickness in Feet		Unit No.	
Unit	To Base		
405	4497	20	Covered interval, probably a continuation of the fine-grained sandstone unit below.
585	4092	19	Sandstone, similar to unit 22. This unit contains some conglomerate stringers 3 ft. to 6 ft. thick which resemble unit 21.
15	3507	18	Conglomerate, similar to unit 23.
70	3492	17	Fine-grained, white, siliceously cemented sandstone. This interval has an irregular, "knobby" weathered surface due to variations in cementation. Thin interbeds of red chert grains, and quartz sandstone form several covered intervals.
420	3422	16	Coarse-grained, dark red to maroon, manganese- and iron oxide-stained sandstone. Laminations of about 1/4 in. are due to variations in color and grain size. Much of the unit forms a covered slope, with a few more resistant units cropping out. The sand grains are sub-angular quartz and red chert. In a small dimension stone prospect pit it can be seen that the unit breaks easily into flaggy 3 to 4 in. thick pieces.
371	3002	15	Deep red to orange stained conglomerate with coarse sandstone layers (similar to unit 16) up to 3 in. thick. The matrix is coarse sand,

Thickness in Feet		Unit	
Unit	To Base	No.	
371	3002	15	and pebbles up to 1 1/4 in. are common with 2 to 3 in. pebbles present near the upper contact. The pebbles are from the following rocks: Diamond Peak(?) quartzite, white vein quartz, very fine-grained, light grey quartzite, and rhyolite with biotite and plagioclase phenocrysts like that found as cobbles in unit 21. Within one half mile this unit becomes quite green colored, but retains the same composition.
40	2631	14	Red and white mottled medium to coarse-grained sandstone. The red coloration is due to a combination of iron oxide and approximately 40 percent red chert grains within the rock. In certain portions this rock is quite silicified and stained with manganese oxide.
105	2591	13	Conglomerate, similar to unit 15.
380	2486	12	Reddish stained, buff, medium-grained, tuffaceous sandstone with a siliceous cement. The grains are sub-angular quartz grains. The lower 15 feet are well bedded and form a ledge, while the rest forms a more gentle slope.
500	2106	11	Covered interval, probably a poorly cemented sandstone somewhat resembling unit 12.

Thickness in Feet		Unit No.	
Unit	To Base		
128	1606	10	Conglomerate, similar to unit 15. Twenty feet from the top this unit becomes a coarse cobble conglomerate. Sub-rounded to sub-angular cobbles, especially of Diamond Peak(?) quartzite, up to 6 in. in diameter are not uncommon.
76	1478	9	Sandstone, similar to unit 14.
12	1402	8	Very silicified conglomerate, probably similar in composition to unit 13.
268	1390	7	Sandstone similar to unit 14.
329	1122	6	Covered interval. From float present the unit is believed to be a fine-grained, poorly cemented white sandstone.
368	793	5	Conglomerate, similar to unit 13.
278	425	4	Covered area, probably sandstone or pebbly sandstone.
104	147	3	Red and orange weathering, greenish white, fine-grained quartz sandstone composed of sub-angular grains.
5	43	2	Conglomerate, similar to unit 13. This unit also contains some angular lithic fragments that resemble the sandstone directly below.
38	38	1	Red stained, light grey to white, porcelaneous, fine-grained sandstone.

Boundary fault.

QUATERNARY DEPOSITS

The Quaternary deposits of the thesis area were divided into Quaternary Alluvium and older alluvium. The older alluvium consists of poorly sorted gravels, sands, and soils which are being incised by present drainage systems. The deposits of these streams and the younger soil cover are the Quaternary Alluvium.

Alluvial deposits are rather widespread in the area, but they were mapped only where the underlying rocks did not crop out. In areas where the underlying formations were known but alluvium covered most of the exposures, actual outcrops were shown on the map by fine dotted lines and an increased color intensity.

Bishop Canyon Section of Devonian

Apparently conformable covered contact with the Diamond Peak(?) Formation.

Thickness in Feet Unit	To Base	Unit No.	
1088	3851	6	Grey, light purple, or olive weathering black or very dark grey limestone. This unit has 2 to 3 in. beds which alternate with beds 1 foot or thicker. The upper 60 feet is almost exclusively heavy bedded; below this, thick- and thin-bedded intervals are nearly equal. The thinly bedded intervals are black, somewhat sheared and broken calcilutites or calcisiltites. The bottom surfaces of some of these calcilutite beds sometimes exhibit sole markings which are apparently load casts. The thicker units are medium to coarse calcarenites with 5 to 20 percent sub-rounded clear quartz or black chert grains. Some beds may approach calcareous sandstone, with the resistant sand grains distinctively protruding from weathered surfaces. The entire unit is somewhat veined with white calcite.
1011	2763	5	Dark grey, massive calcilutite or calcisiltite which contains several 3 foot intervals of thinly laminated calcilutite about 560 feet from the base. A few completely recrystallized Favosites sp. are seen approximately

Thickness in Feet		Unit No.	
Unit	To Base		
1011	2763	5	400 feet from the base. The entire unit has an extremely rough weathered surface, produced by small, sharp protrusions of rock. Randomly orientated 1/8 to 1/2 in. white calcite veins occur every few inches throughout the unit.
66	1752	4	Very dark grey and black weathering, black, dense calcilutite which is thin-bedded in 2 to 3 in. beds with 6 to 12 in. beds interspersed. Some white calcite veins are present, many being parallel to bedding.
86	1686	3	Similar to unit 5, but containing also several beds of "spagetti rock." (Cladopora sp.)
253	1600	2	Thin, irregular bedded calcilutite similar to unit 4, but containing numerous thin fossiliferous beds. At approximately 175 feet from the bottom, specimens of Atrypa sp., Cladopora sp. (Coenites), and numerous broken brachiopods and chrinoid fragments were collected. Stringocephalus sp. may be present in these fragments but no identification can be made.
1347	1347	1	Very massive, dense, light grey weathering, ledge-forming, dolomitic, dark grey limestone. The rock has a medium-crystalline, sugary, recrystallized texture, and is heavy bedded, with

Thickness in Feet		Unit	
Unit	To Base	No.	
1347	1347	1	bedding planes often only distinguishable every 10 to 15 feet. Commonly, thin laminations (less than 1/8 in.) are found directly above distinctive bedding surfaces in the lower part of this unit. Weathered rock surfaces present a black, broken appearance.

Boundary fault.

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PLATE I

GEOLOGIC MAP OF THE BISHOP CREEK AREA ELKO COUNTY, NEVADA

by

Larry J. Garside

Scale 1:25,000

0 1/2 1 2 MILES

Geology June-September 1967

EXPLANATION

QUATERNARY

- Qal — Alluvium
- QTa — Older Alluvium

TERTIARY

- Ts — Clastic Sequence
- Tt — Welded Tuff
- Tr — Rhyodacite
- Tv — Volcanic Neck

UNCONFORMITY

- Pp — Phosphoria Formation
- Cdp? — Diamond Peak(?) Formation

PARACONFORMITY

SILURIAN(?) DEVONIAN

- Du — shale — Includes: Guilmette Fm., Simonson Fm., Sevy Fm.
- Ss — Siliceous Shale

Outcrop

Contact

Fault, showing dip

Probable fault

Covered fault

Axial Trace of Syncline

Dip of Beds

Vertical Beds

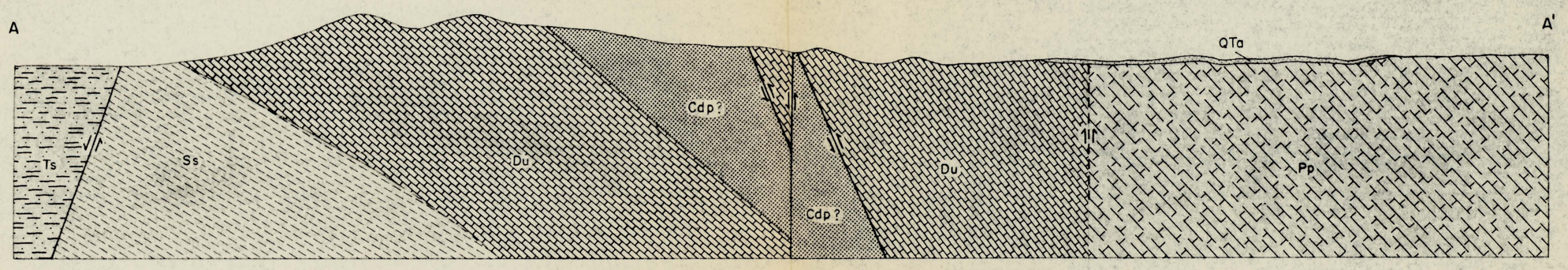
Horizontal Beds

Spring

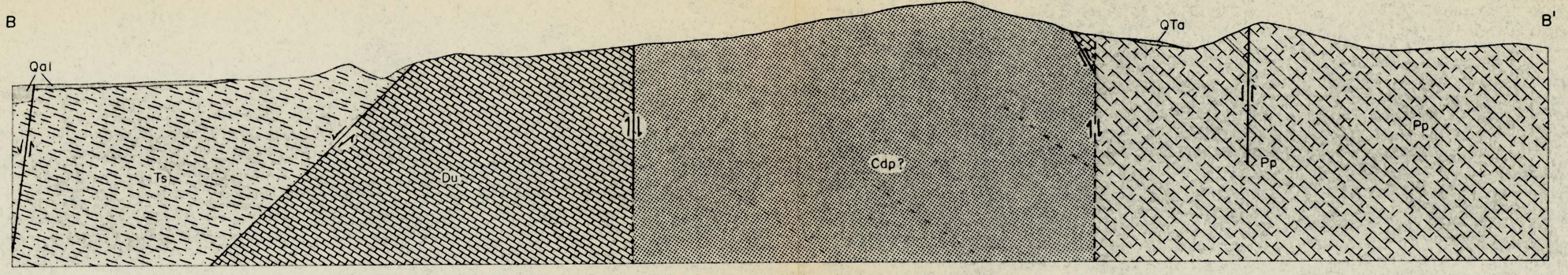
Intermittent Stream

Perennial Stream

N 17° Magnetic North



SECTION A–A'



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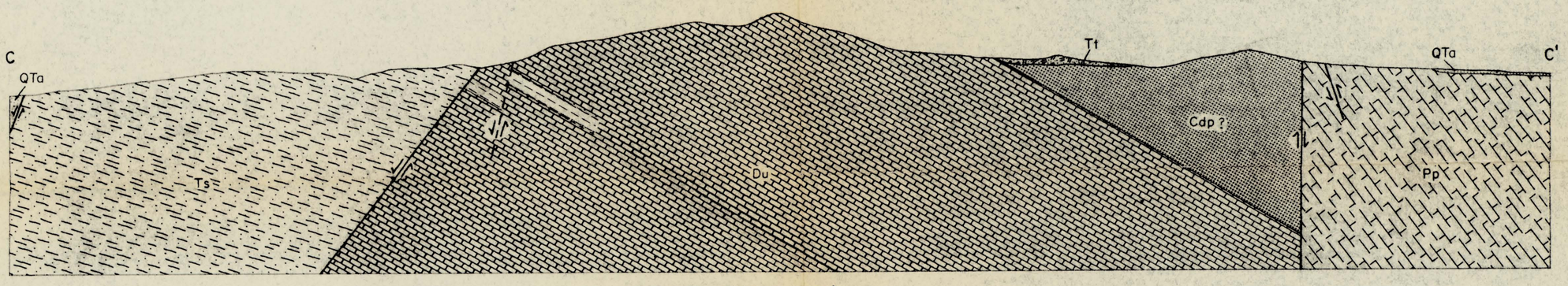

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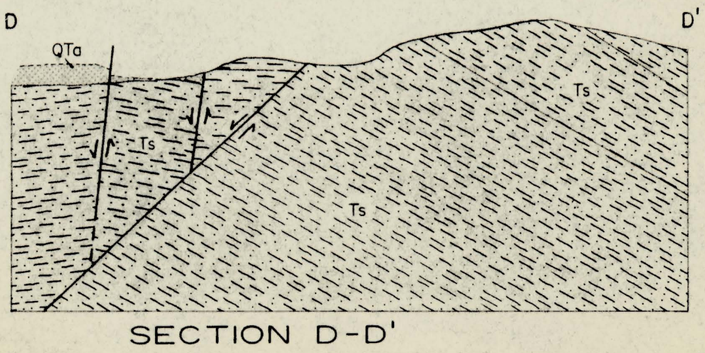

SECTION D–D'

EXPLANATION

- Qal — Alluvium
- QTa — Older Alluvium
- Ts — Clastic Sequence
- Tt — Welded Tuff
- Pp — Phosphoria Formation
- Cdp? — Diamond Peak(?) Fm.
- Du shale — Includes: Guilmette Fm., Simonson Fm., Sevy Fm.
- Ss — Siliceous Shale

Scale 1:25,000

0 — 1/2 — 1 — 2 Miles

PLATE II

CROSS SECTIONS OF THE BISHOP CREEK AREA ELKO COUNTY, NEVADA

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