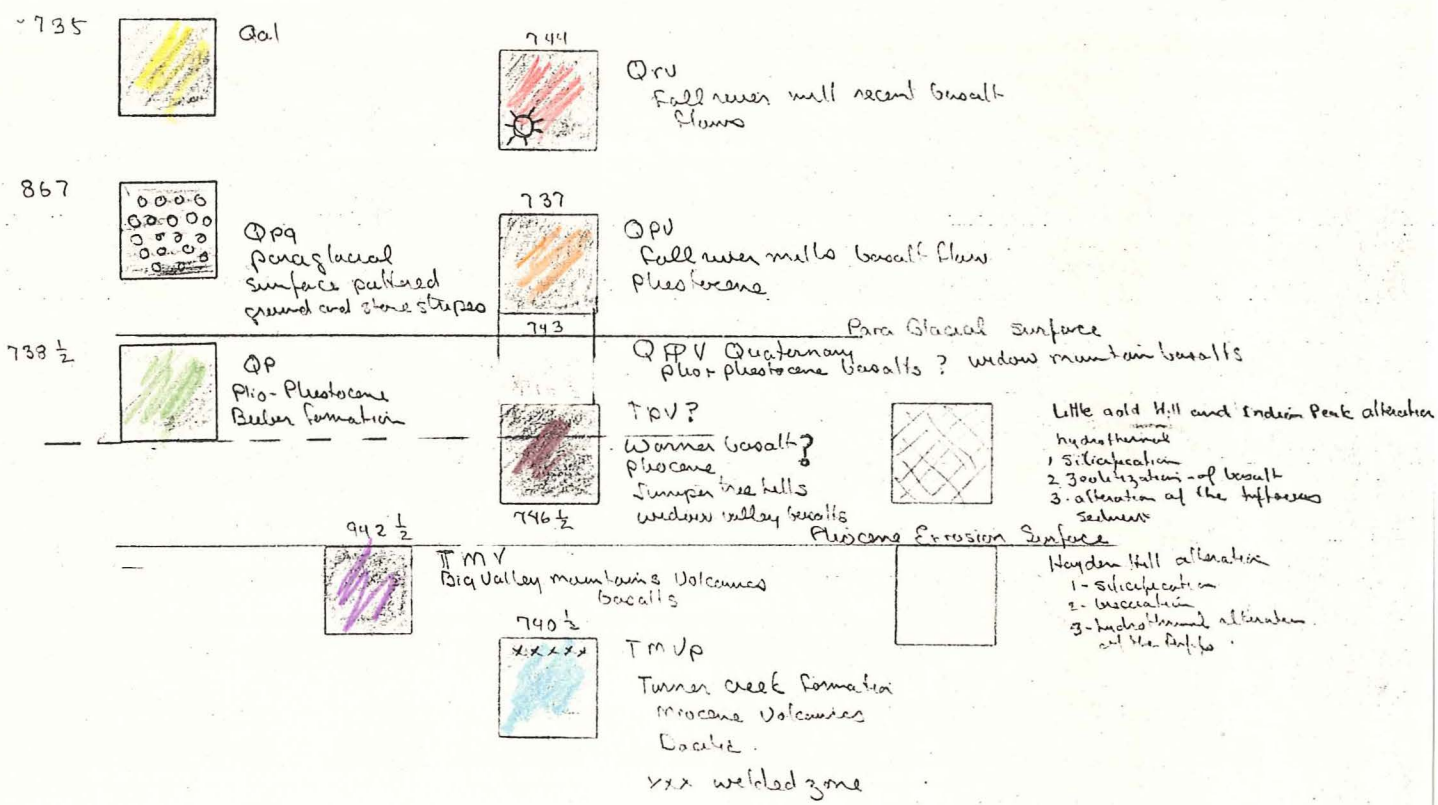
Amax - Eason Beuben Project
Big Valley -
L.K Richardson 1975

Explanation



- cinder cone
- eruptive center
- questionable center of eruption
- 30° strike and dip measured
- photo-interpreted attitude of a old surface
- 3° measured old surface

[AMax Exam] R. Lindsey M75

EW Sketches depicting the evolution of Big Valley

Pre-Miocene ? Volcanics

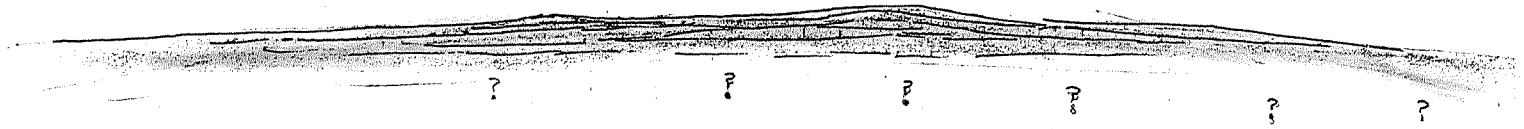
These rocks may exist below the Turner Creek formation of Big Valley.

Their existance is suspected because of the presence of xenoliths of basaltic composition in the tuffs of the Turner Creek formation.

There are no recognizable outcrop of these rocks in big valley.

Because of the lack of exposure it feel that the complex was part of a shield type volcanic series. A low relief volcanic province that would not influence the topography of later volcanic eruptions.

Presently there is no way to estimate the thickness or areal extent.



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EW Sketches depicting the evolution of Big Valley

Miocene ? Volcanics

① Turner Creek formation and Big Valley mountains

The Turner Creek formation comprises a series of volcanic centers that supplied large volumes of pyroclastic material and flows. Compositionally the rocks in this series vary from rhyolites to andesites. With the bulk of the pyroclastics probably being Dacitic in composition.

Texturally the volcanics vary from small isolated flows of andesites and dacites to large featureless piles of pyroclastic material.

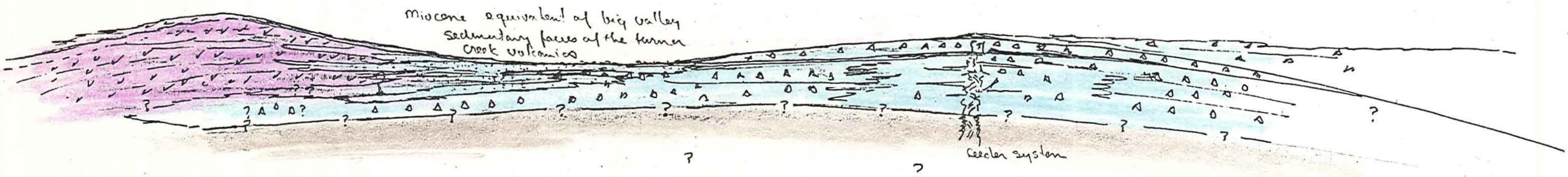
There are also large welded tuff units that appear to be an expression of the formation of acid volcanic activity in the miocene. These ash flows were of significant magnitude or heat content to form densely welded zone(s) 15 to 25' thick. There may be more than one of the welded tuff units.

② Turner Creek formation sedimentary facies

[illegible]. The pyroclastic debris was transported short distances to local basins the formed as the result of coalescing eruptive centers.

The following rock type can be found in these basins:

1- reworked pyroclastic debris. Pumaceous sand and gravels.
2- Clays and muds derived from the volcanics
3- Air fall ash and tuffs.
4- Diatomites formed in the basins
5- Some of the lower units have blocks of basalt that indicate contemporaneous eruption of lavas of basaltic composition



③ Big Valley Volcanics.

The expression of these older High Alumina basalts can be seen in the Big Valley mountains SW of Bieber.

Because of the lack of tuffaceous units in the upper portion of this series. The volcanic eruptions continue after the termination of the Turner Creek Volcanics.

These volcanics are characterized by thick massive flows of High Alumina basalt and local? pyroclastic areas. Also the highly developed soils and drain[illegible] systems were used as important criteria to establish the relative age of these volcanics.

④ The climax of the Turner Creek volcanic eruptions was marked by the Hayden Hill Gold mineralization. The follow features are associated with this event:

1- Small rhyolite intrusions
2- breccia zones of silicified tuffs
3- Silicification and hydrothermal alteration of the tuffs.

The total thickness of the turner Creek could have been in excess of 4,000'. There easily could have been peaks of similar size and shape to [illegible] present express of the lassen volcanic series.

[A max Eason] Richardson 1975

EW sketches depicting the evolution of Big Valley

Plio-Pleistocene erosion and volcanism

① During the Plio-Pleistocene rapid erosion of the poorly consolidated portions of the Turner Creek formation produced an erosion surface which was primarily controlled by resistant units within of the Turner Creek formation. The densely welded zones of the rhyolitic tuffs were resistant enough to produce topographic highs. Also mineralized zones with the accompanying silicifications produce local highs on this erosion surface. The weathering of the silicified material produced a quartzite conglomerate that characterizes this surface.

② Barber formation?

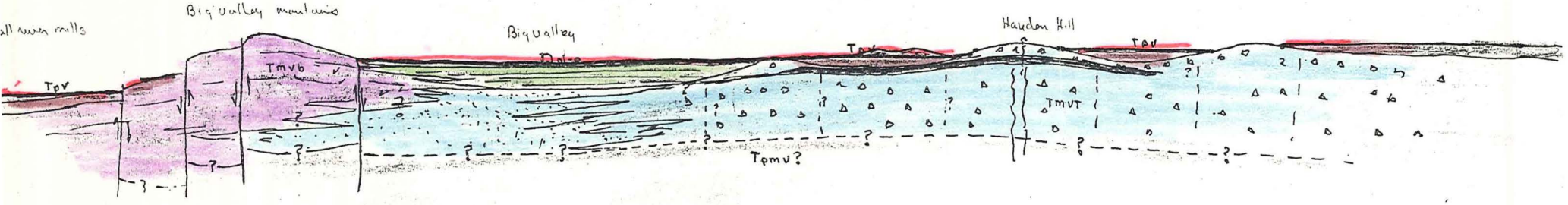
Local Basin deposits were also being deposited contemporaneously with the erosion of the topographic highs. Their lithologies 'are' - similar to Turner Creek Sediments

In old Turner Creek basins Barber formation deposits are probably deposited conformably on the Turner Creek beds. But as the basins filled the Barber formation sediments were deposited on an erosional unconformity.

Near the completion of Barber deposition fissure eruptions produced thin flows of High Alumina Basalts that filled the topographic lows associated the plio-pleistocene erosion surface.

With the completion of these flows the area entered a stable period were no drastic changes in the basinal structure occured. The loading of the Pliocene basalts on the Turner Creek pyroclastics produce compacted zones beneath the basalt and also marginal fractures.

Greywacke sands are more prevalent in the upper portions of the Barber formation.



③ This period of development was followed by the formation of a soil surface in response to Pleistocene? paraglacial processes. Features that formed that make this surface readily identifiable include:

1. patterned ground on all surfaces where sufficient water saturation could support involution.
2. Stone stripes on talus slope and in drainage networks.

Qpg Quaternary paraglacial surface

Qpl-p Quaternary Plio-Pliestocene upper Turner Creek or Barber

Tpv Tertiary pliocene volcanics Warner Basalt equivalents?

Tmvb Tertiary m e volcanics Big valley mountain

Tpmv Tertiary pre miocene volcanics

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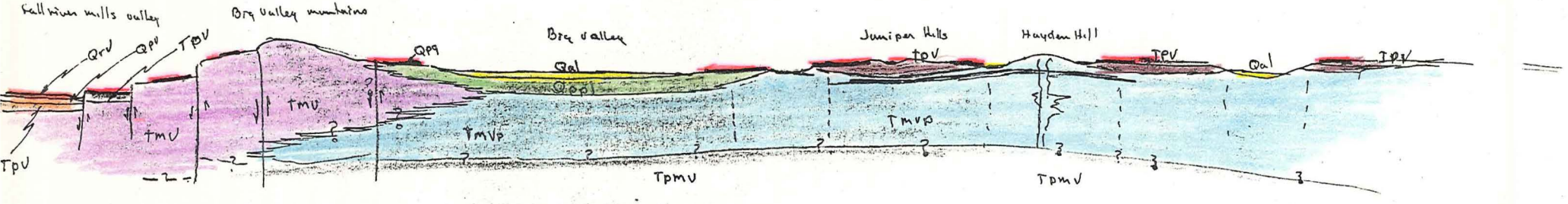
EW sketches depicting the evolution of Big Valley

Quaternary - erosion and volcanism

Pleistocene volcanism was restricted to the north and south ends of the big valley mountains and the Fall river mills valley.

As the pit river cut its way through the basalts at the South end the big Valley Mountains. Big Valley started to seek a new base level and the old pre glacial surface in the center of the valley was eroded away in part being replaced by quaternary alluvium and basin deposits

Volcanism actually in fall river mills valley continues to be active even in the Holocene.



- Qal alluvium
- Qpg pre glacial surface
- Qppl Burlen formation
- Qrv recent volcanic basaltic
- Qpv pleistocene volcanic basaltic
- Tpv pliocene? volcanic basaltic (warner?)
- Tmv miocene? volcanics basaltic Big valley mountains
- Tmvp miocene? volcanics pyroclastics turner creek?
- Tpmv Pre-miocene? volcanics basaltic -

* This were probably on series that continue into the early pliocene?.