STRATIGRAPHY AND PETROGRAPHY OF HETTANGIAN TO SINEMURIAN LACUSTRINE CARBONATES OF THE GLEN CANYON GROUP, WASHINGTON COUNTY (SW UTAH)

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Stratigraphy

- Carbonate beds 2 to 60 cm thick

- [Carbonate : Siliciclastic] in Whitmore Point Mbr (1:33) < Kayenta Fm (1:6)

- Different fluvial systems
KAYENTA FM

- Lacustrine depocenter to NW
- Replaced by fluvial red-bed deposits
- Lake margin deposits less significant
Lithologies and fossils

PS-NW4-A, (Kayenta)
• Ganoid fish scales

PS-NW4-Oolite (Whitmore Point)
WV-WP1
(Whitmore Point)

PS-NW4-Delta
(Whitmore Point)
Whitmore Point microbialites, WV

- Usually with silicification or neomorphism
- Related to fish mortality events
Pseudomicrokarst

Nodulization

Brecciation

Dolomitization

Marmorization?

Pseudomorphs after sulfates

Textures: Alonso-Zarza & Wright (2010)
Alveolar-septal; root textures

PS-NW4-4 (Kayenta)

(Whitmore Point) WV
Circumgranular cracks and nodulization

K (Kayenta), St. George

M-2 (Kayenta), Kanab
Sulfate-related features

- More common in the Kayenta Fm.
- Evaporative environment
Cauliflower chert

• John Warren, from Milliken (1979)

PS-NW4-4 (Kayenta)
Magadi-type chert, length-slow chalcedony

- Length-slow chalcedony (quartzine or lutecite): alkaline or sulfate-rich environments
  Folk and Pittman (1971)

PS-NW4-Gamma (Whitmore Point)
Petrofabrics and paragenesis timing

• Eogenesis:
  pedogenesis, sulfates, chert, silicification, dolomitization

PS-NW4-4
(Kayenta)
Sulfates after or during bioturbation

WV-2.2 (Kayenta)
- PS-NW4-2 (Kayenta)
- Early silicification features: Bustillo (2010)

PS-NW4-Gamma (Whitmore Point)
Silica: at least 2 phases

- Length-fast chalcedony: silicification or replacement (posterior phase)

WV-WP1
(Whitmore Point)
• Burrows prior to dolomitization

WV-3 (Kayenta)
Dolomicrospar after calcite pseudomorphs after sulfate

K (Kayenta),
St. George
• Dolomicrospar after alveolar-septal

K (Kayenta), St. George
• Dolomitization after silicification

WV-WP1
(Whitmore Point)
Conclusions

- Lacustrine depocenter and adjacent paleoenvironments.
- Low-grade, low-energy, frequent regressions (fine-grained, restricted shore units, pedogenesis and desiccation).
- Ephemeral lakes or closed hydrographic basin (desiccation, water chemistry, evaporation). Balanced-filled or underfilled lake successions.
- The above factors and the overall complex early diagenesis may suggest a semi-arid climate.
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References


