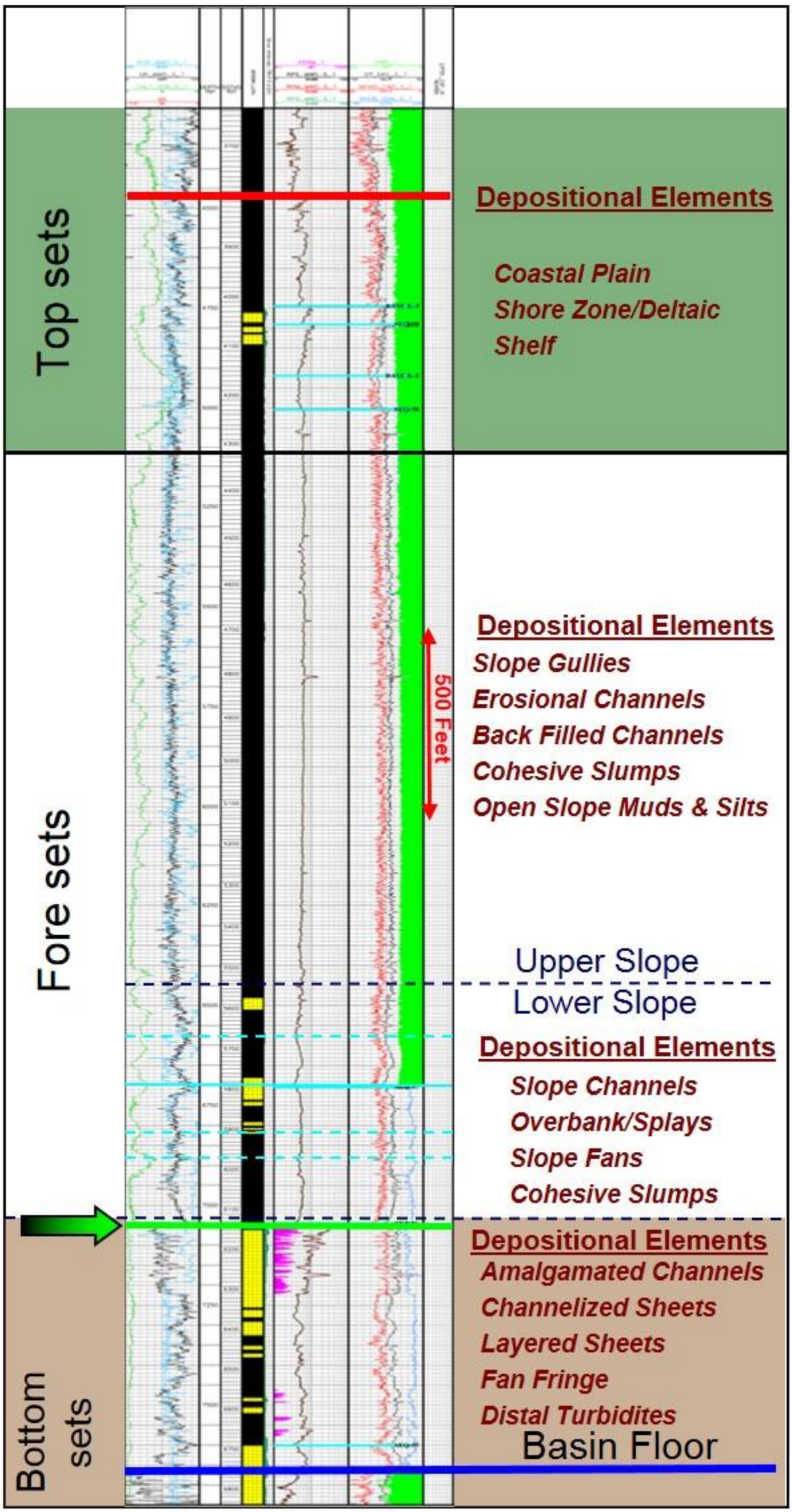
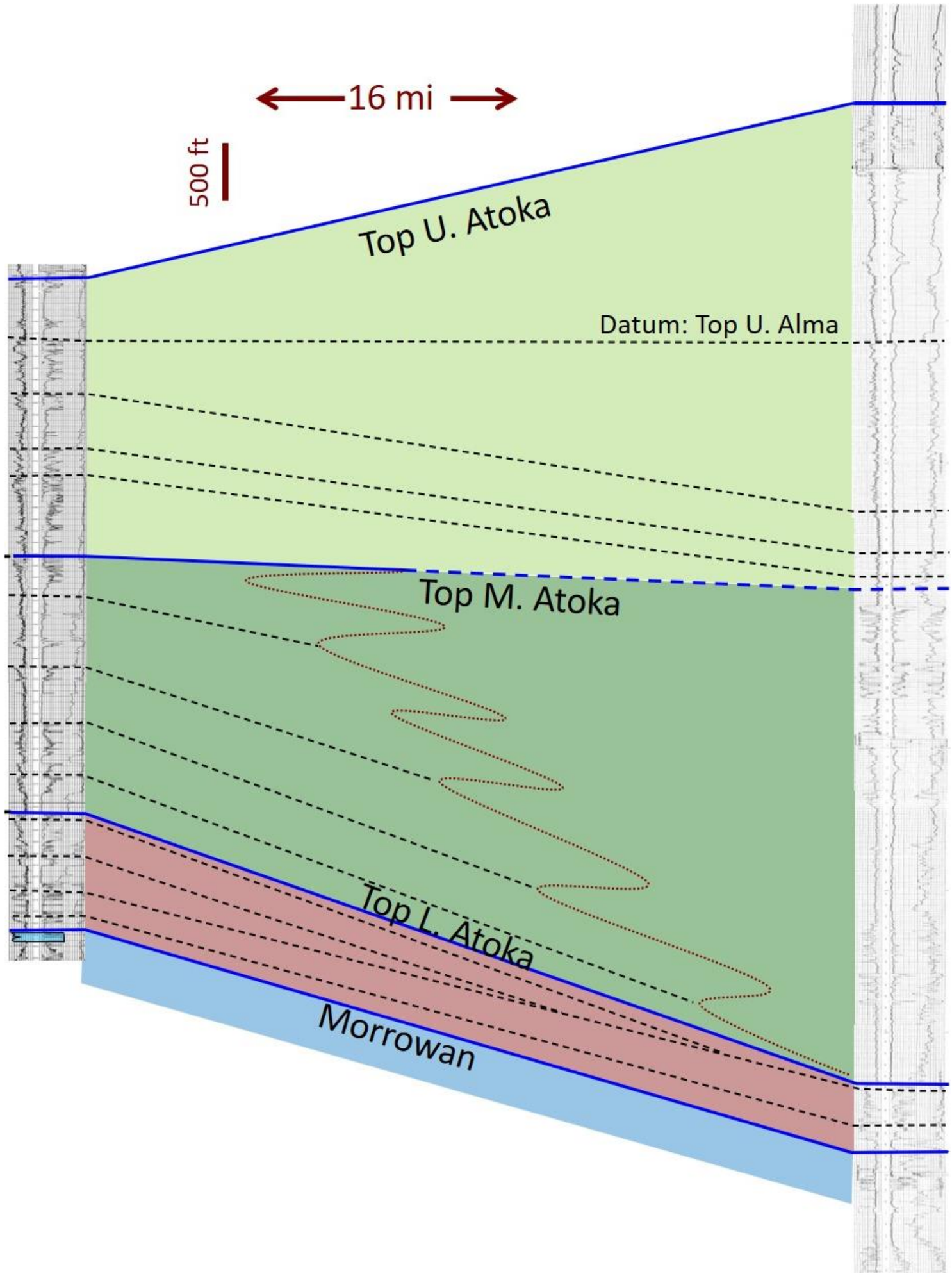
Divide the well log into large scale packages based on log motif. (3 to 5 packages)

Given the gross interval thickness, what do these divisions represent?

Exercise 1
Basin Fill Motif





Compare the gross log motif between these wells.

Given the vertical scale, does this represent log motif at the depositional systems scale or the basin scale?

Can you suggest a proximal to distal transition?

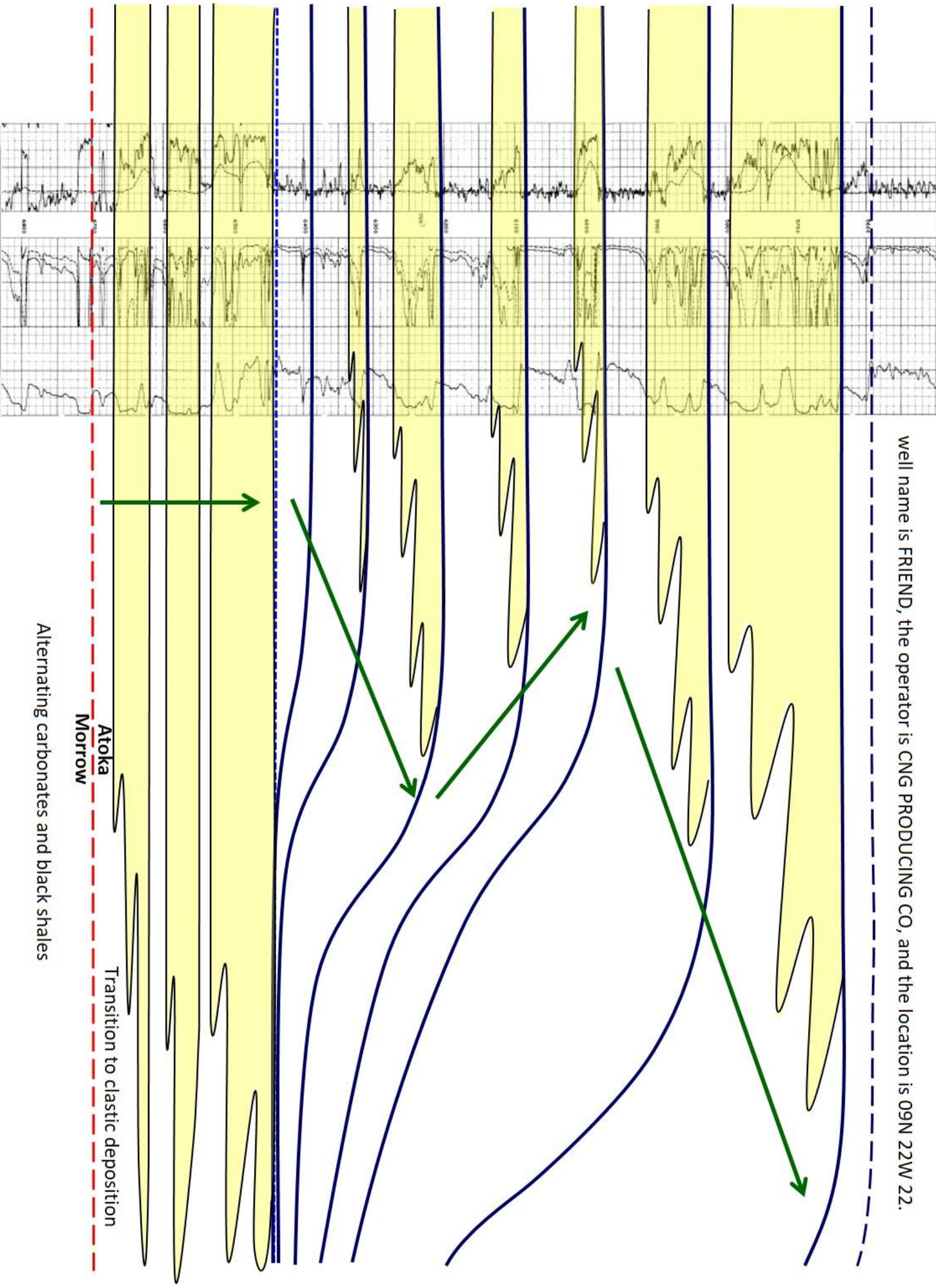
Exercise 2: Basin scale log motif

Divide the well log into large scale packages based on log motif. (3 to 5 packages)

Given the gross interval thickness, what do these divisions represent?

Exercise 2

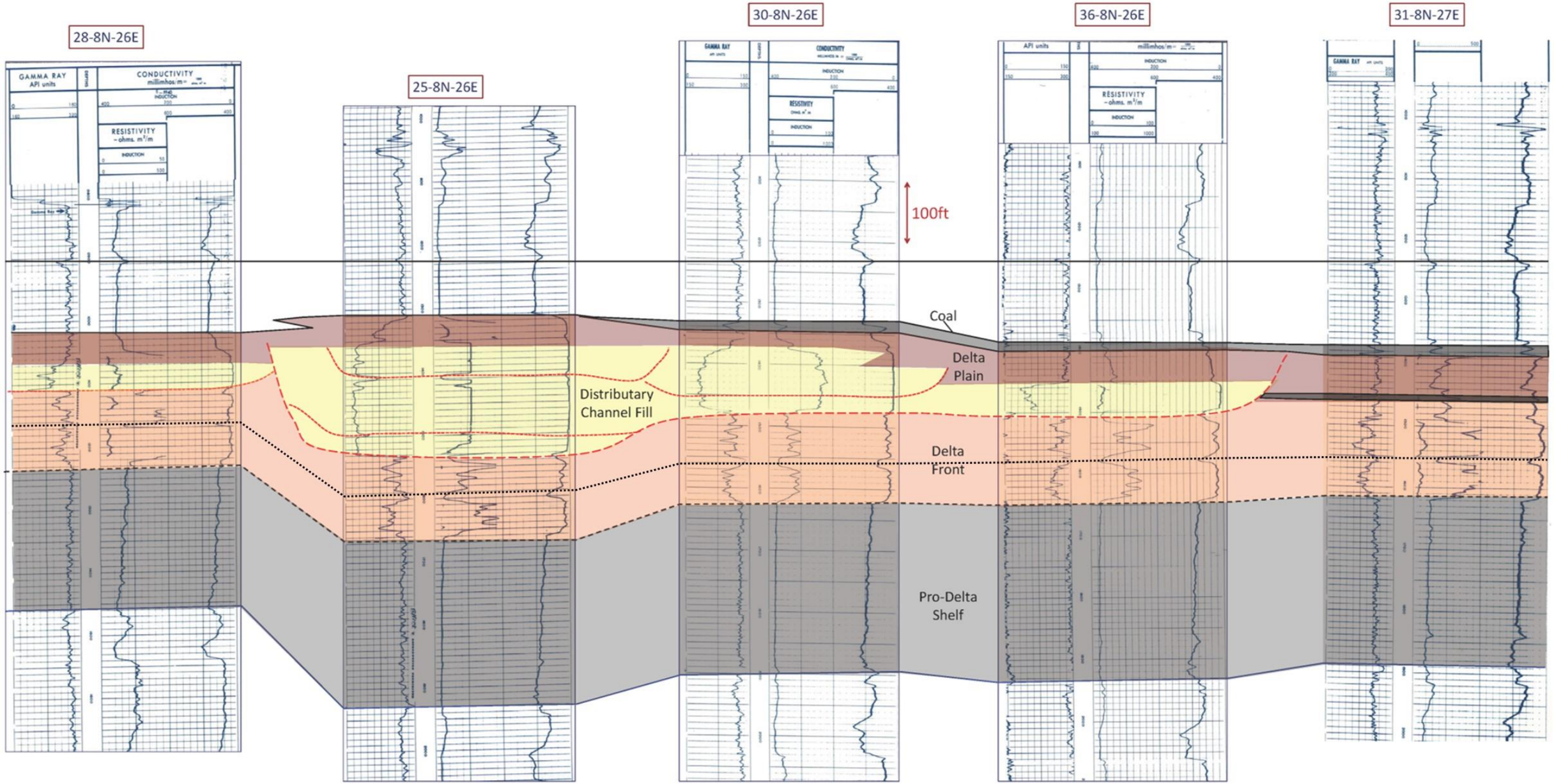
Solution



Exercise 4:
Log Motif Correlation

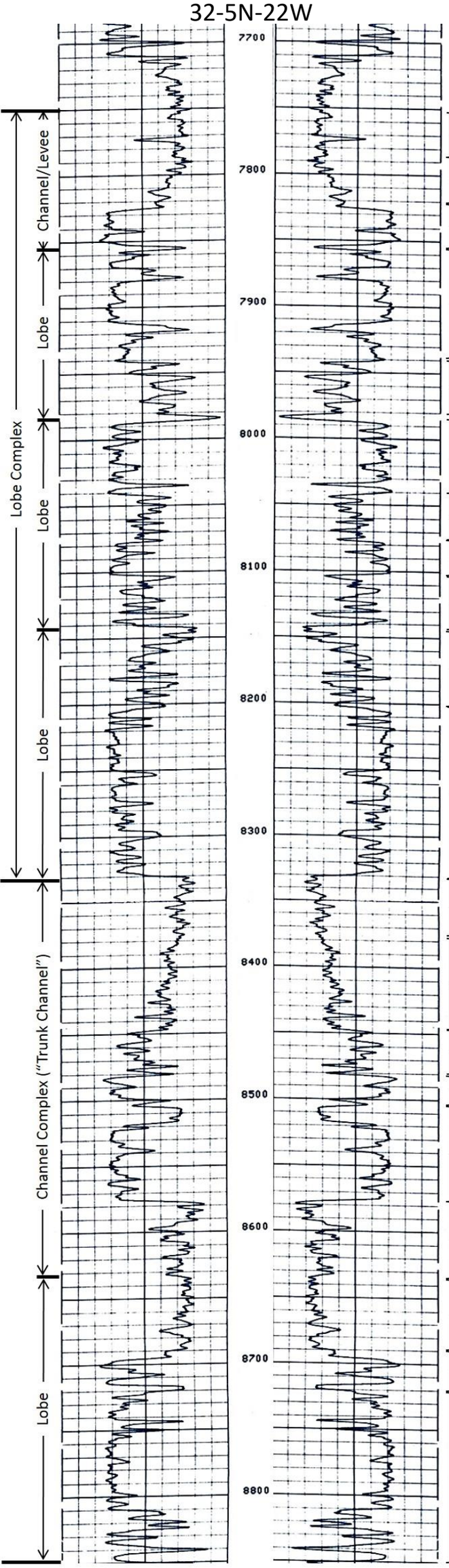
Solution

1) What observations can you make about the log motif?
2) Correlate equivalent log motif facies.
3) Color and label the component depositional elements
4) Identify the reservoir facies/bodies and describe the degree of compartmentalization.



Exercise 5: Stratigraphic Cyclicity and Log Motif

Arco Expl. Peeler Gap 1-32
32-5N-22W



- *How many scales of cyclicity would you divide this deepwater succession into?*
- *Can you speculate on stratigraphic architecture (layered sheets, amalgamated sheets, etc.) or depositional elements based on log motif (lobe complex, channel/levee etc.)?*

Unconfined, overbank: may contain "random" overbank sheet events resulting from outsized flows

Levee: lateral equivalent to channel fill below therefore comparable sands may occur at this stratigraphic level

Channel Fill: lateral continuity may vary greatly – isolated channel to a tabular channel complex with lateral extent less than associated lobes.

Amalgamated Sheets: Thick bedded sandstone units 5 to 35 ft in thickness organized into a cyclic stack punctuated by 2 to 5ft shales.

Layered Sheets: Interbedded sandstones and shales with broad lateral continuity.

Amalgamated to channel Sheets: Thick bedded sandstone units 5 to 35 ft in thickness, may contain low relief distributary channel fills.

Layered Sheets: Interbedded sandstones and shales with broad lateral continuity.

Amalgamated Sheets: Thick bedded sandstone units 5 to 35 ft in thickness organized into a cyclic stack punctuated by 2 to 5ft shales.

Layered Sheets: Interbedded sandstones and shales with broad lateral continuity.

Layered Sheets: Lobe abandonment – lobe shifting laterally away from this vertical location.

Amalgamated Sheets: Thick bedded sandstone units 5 to 35 ft in thickness organized into a cyclic stack punctuated by 2 to 5ft shales. Lack of underlying layered sheets suggest rapid onset of sand-rich deposition; up systems avulsion event?

Unconfined, overbank: may contain "random" overbank sheet events resulting from outsized flows

Distal Levee: Thin bedded units as below but lower net:gross; punctuated by "random" overbank event beds.

Proximal Levee: Thin bedded, commonly ripple laminated sand-rich units adjacent to active channel

Channel Fill: lateral continuity may vary greatly – isolated channel to a tabular channel complex with lateral extent less than associated lobes.

Amalgamated Channel Fills: essentially the same channel fill facies as above but focused into a "channel belt" with limited preservation of levee/overbank – "lower accommodation" related to compaction or subsidence?.

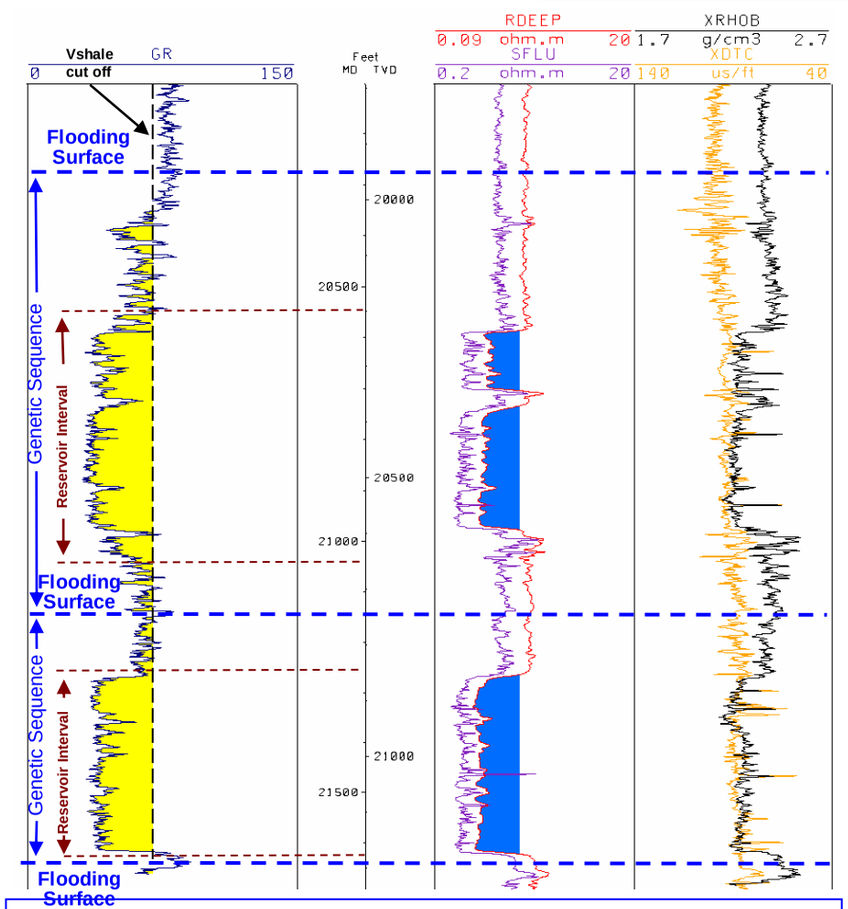
Unconfined, overbank: may contain "random" overbank sheet events resulting from outsized flows

Proximal Levee: Thin bedded, commonly ripple laminated sand-rich units adjacent to active channel

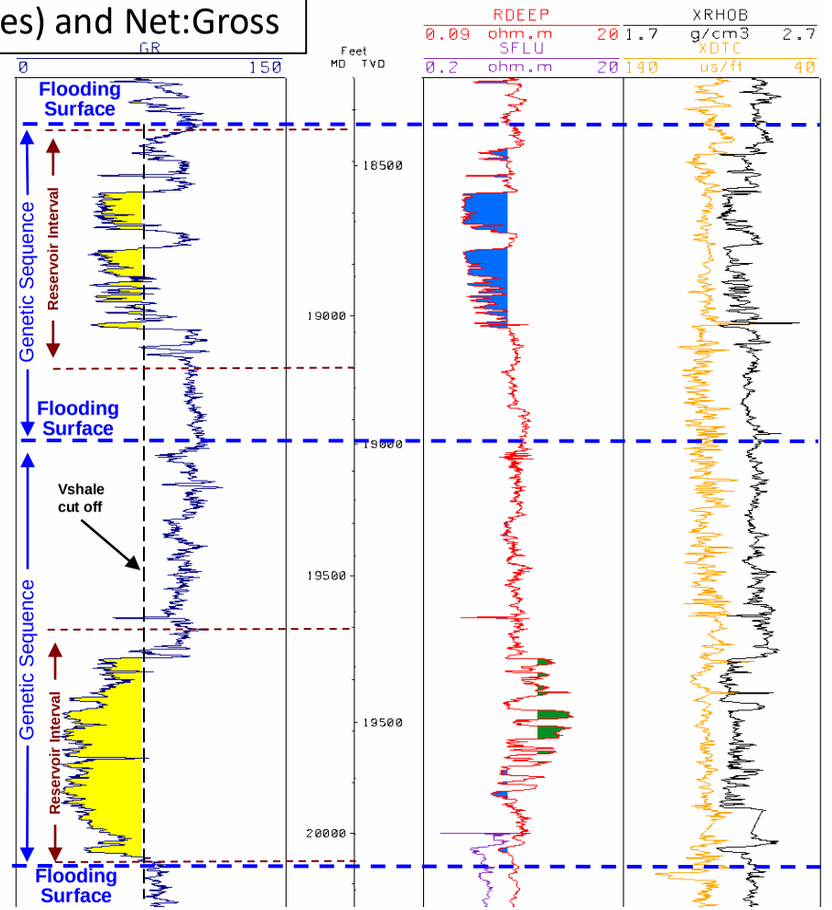
Channel Fill: lateral continuity may vary greatly – isolated channel to a tabular channel complex with lateral extent less than associated lobes.

Amalgamated Sheets: Thick bedded sandstone units 5 to 35 ft in thickness organized into a cyclic stack punctuated by 2 to 5ft shales. Lack of underlying layered sheets suggest rapid onset of sand-rich deposition; up systems avulsion event?

Exercise 6A: Log Motif (depositional cycles & facies) and Net:Gross



Solution



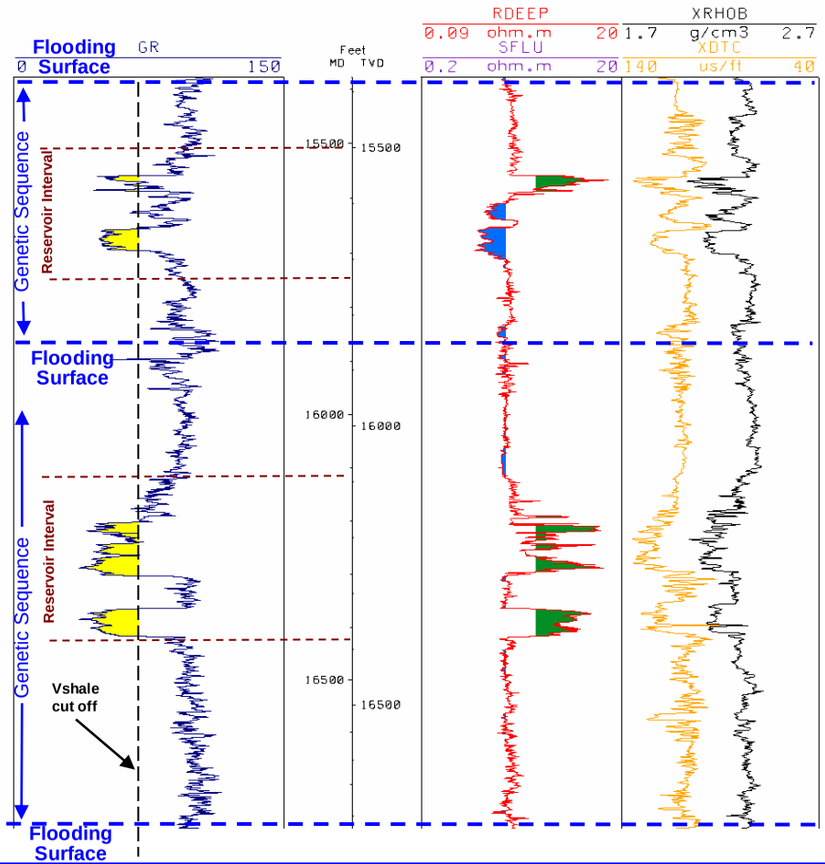
Gross Depositional Environment __Amalgamated Sheets__
Genetic Sequence Thickness ___890'_____
Gross Reservoir Thickness ___480'_____
Gross Clean Sand ___323'_____
Net to Gross ____36%__67%_____

Gross Depositional Environment _Layered to Amaglamated sheets_
Genetic Sequence Thickness ___600'_____
Gross Reservoir Thickness ___400'_____
Gross Clean Sand ___187'_____
Net to Gross ___31%___46.7%_____

Gross Depositional Environment __Amalgamated Sheets___
Genetic Sequence Thickness __500'_____
Gross Reservoir Thickness ___370'_____
Gross Clean Sand ____312'_____
Net to Gross _____62%___84%_____

Gross Depositional Environment ___Channelized Sheets___
Genetic Sequence Thickness ___825'_____
Gross Reservoir Thickness ____460'_____
Gross Clean Sand ___177'_____
Net to Gross ____21.5%__38.5%_____

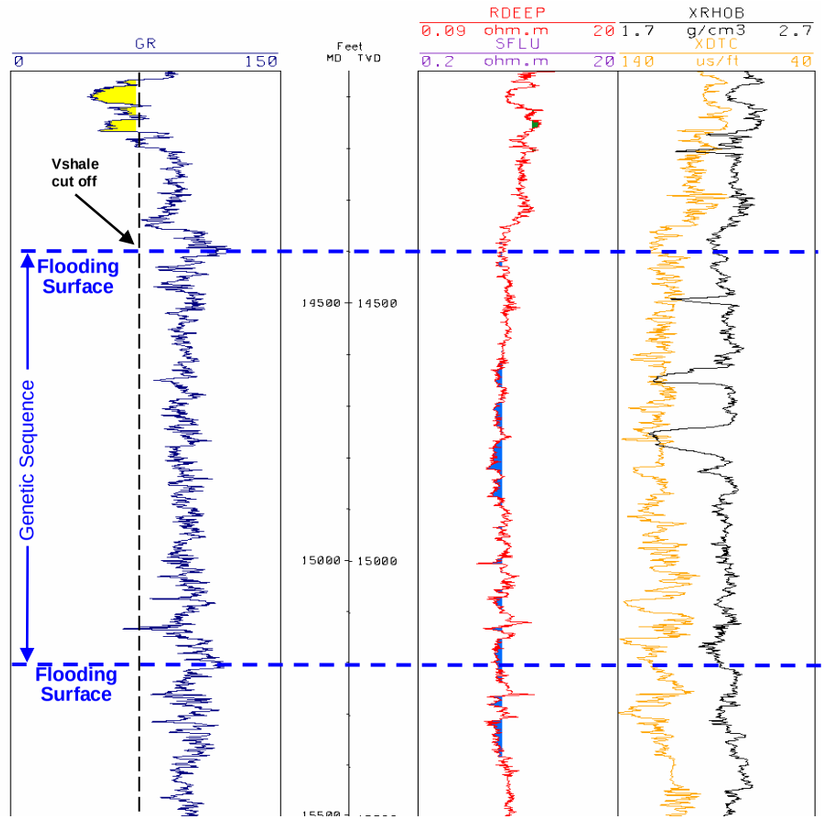
Exercise 6B: Log Motif (depositional cycles & facies) and Net:Gross



Gross Depositional Environment _Channel/levee overbank__
Genetic Sequence Thickness ___400’_____
Gross Reservoir Thickness ___250’_____
Gross Clean Sand ___150’_____
Net to Gross ___37.5%__60%_____

Gross Depositional Environment _Channel/levee overbank__
Genetic Sequence Thickness ___900’_____
Gross Reservoir Thickness __310’_____
Gross Clean Sand __88’_____
Net to Gross ____10%___28%_____

Solution



Gross Depositional Environment _Open Slope_
Genetic Sequence Thickness __800’_____
Gross Reservoir Thickness __0’_____
Gross Clean Sand __0’_____
Net to Gross ___0%_____