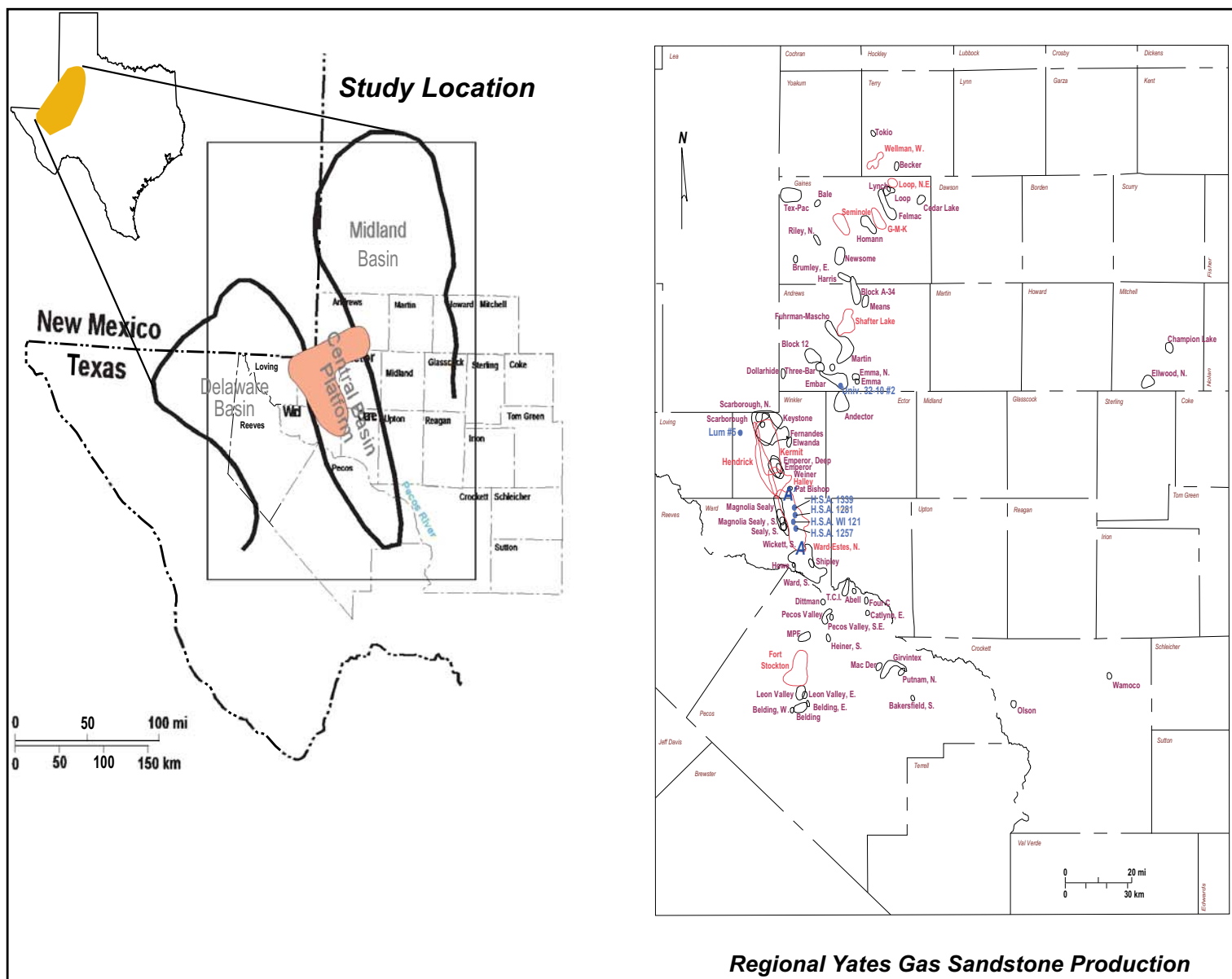


Stratigraphic Characterization of the Yates Formation, Permian Basin, Texas

D. M. Combs, E. M. Kim, S. C. Ruppel, and S. D. Hovorka, Bureau of Economic Geology, The University of Texas At Austin, Austin Texas 78713



Abstract

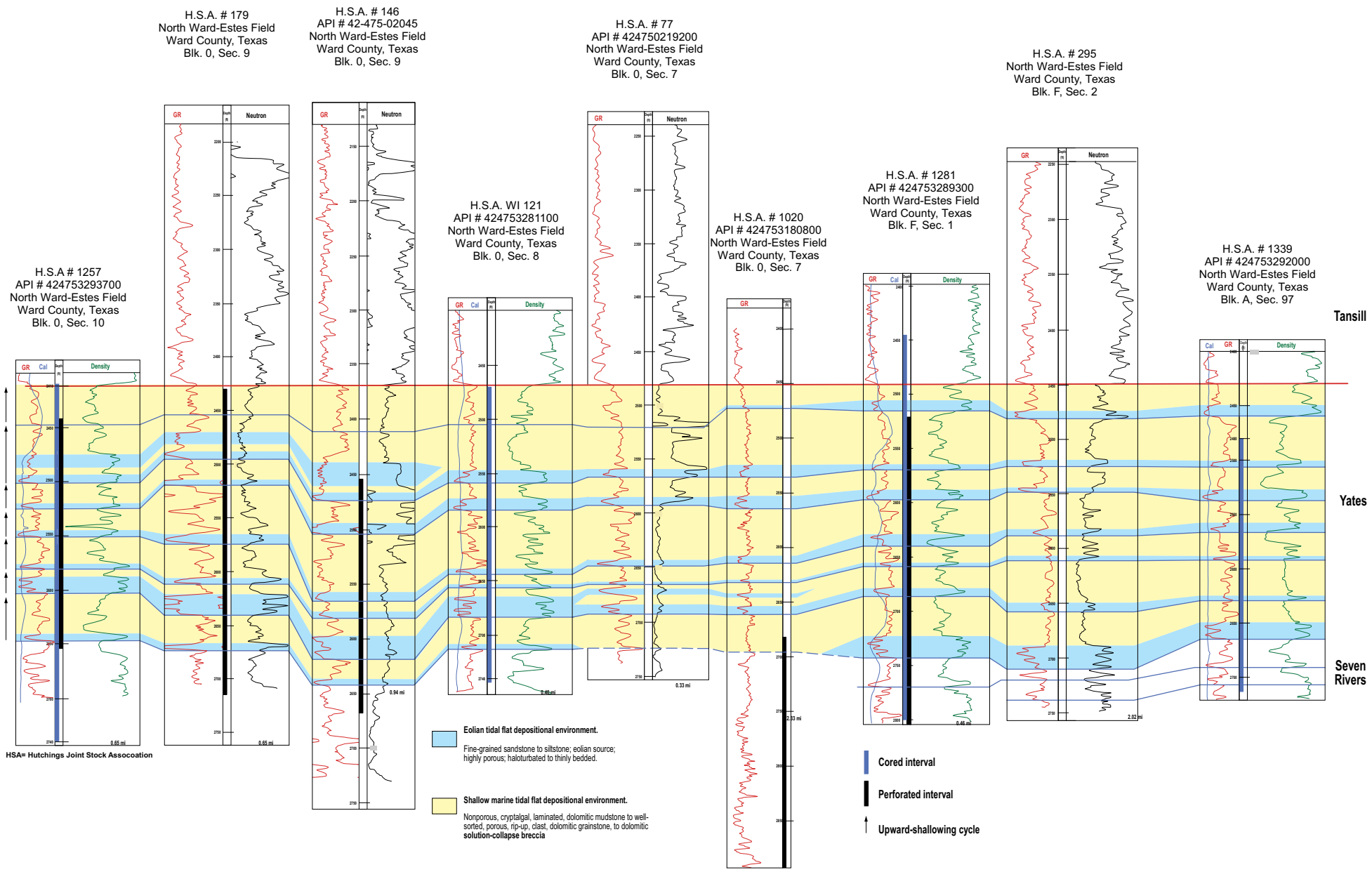
Although the importance of cores for calibrating wireline log data is obvious, such calibrations especially crucial in interpreting lateral variations within the Permian Yates Formation. Integrated log data and core studies of the Yates Sandstone Formation from North Ward-Estes Field, Ward County, Texas, provides a basis for interpreting Yates facies and lithologies from wireline logs. Low gamma-ray signatures in North-Ward Estes Field wells correspond to intervals of thin dolomite and thick anhydrite. By contrast, cores in Kermit Field, Winkler County, Texas, and Embar Field, Andrews County, Texas, reveal that low gamma-ray values represent thick intervals of halite, as well as the aforementioned dolomite and anhydrite. These data support an interpretation of a regional trend of increasingly more open marine facies in Yates sediments to the south in the Permian Basin.

STRATIGRAPHIC ARCHITECTURE OF NORTH WARD ESTES FIELD, WARD COUNTY, TEXAS

D. M. Combs, E. M. Kim, S. C. Ruppel, and S. D. Hovorka, Bureau of Economic Geology, The University of Texas At Austin, Austin Texas 78713

A
South

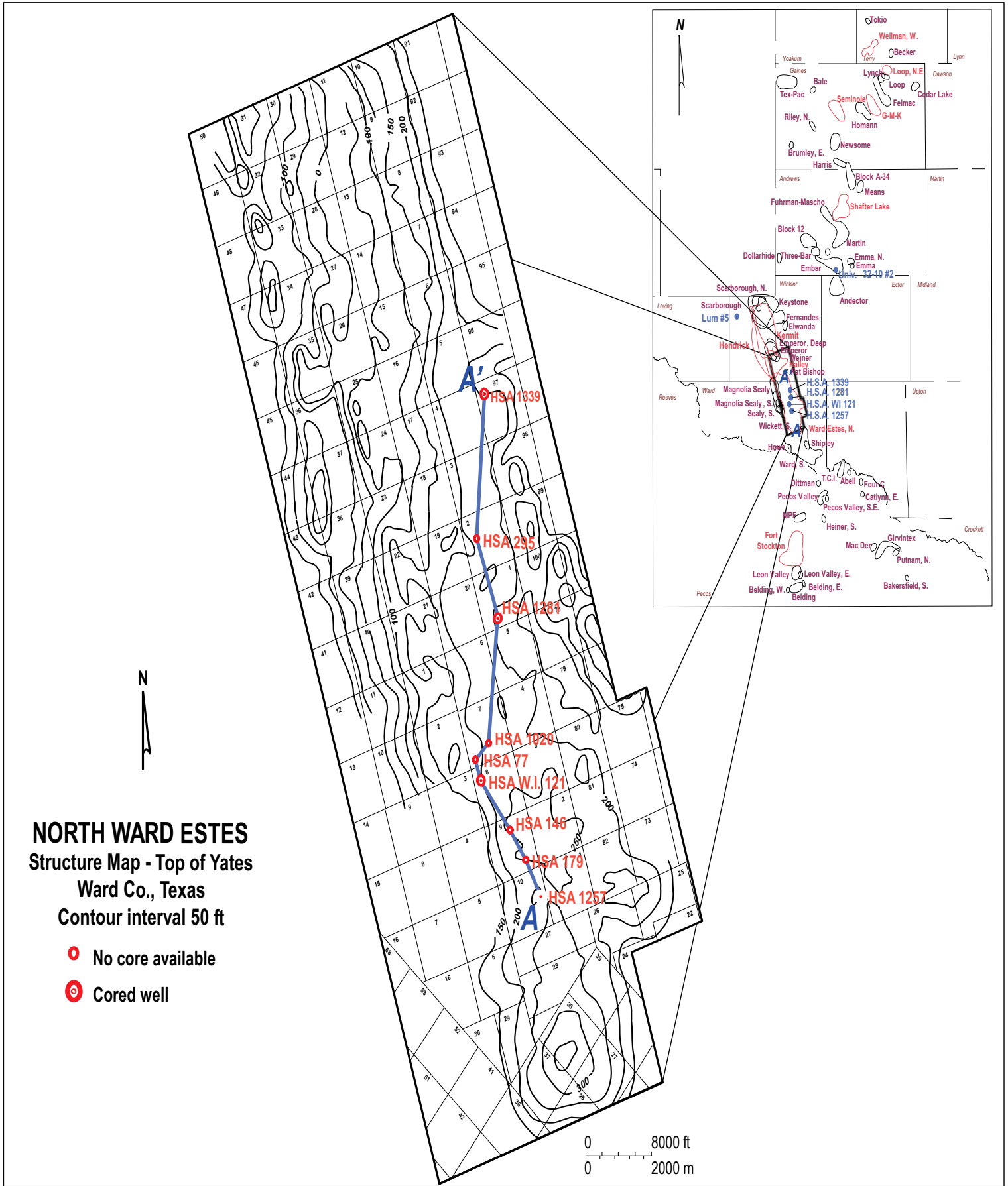
A'
North



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Structure on top Yates, North Ward Estes Field

D. M. Combs, E. M. Kim, S. C. Ruppel, and S. D. Hovorka, Bureau of Economic Geology, The University of Texas At Austin, Austin Texas 78713



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- Deposition within the Yates Formation is a function of cyclic marine flooding over shallow- water exposure or tidal flats.
- Cycle bases are defined by marine facies, such as tidal flat mudstone, anhydrite, and halite, deposited during marine transgression.
- Lateral variations in lithology are probably due to local variations in marine circulation and topography.
- Cycle-based marine units are
 - (1) Crypt algally laminated
 - (2) Brecciated owing to solution-collapse brecciation,
 - (3) Composed of well-sorted, rounded rip-up clasts, and
 - (4) Karsting owing to dissolution.
- Cycle tops are defined by thinly bedded, highly porous, fine-grained eolian sandstone to siltstone.
- Sandstone units are
 - (1) Highly haloturbated
 - (2) well bedded, and
 - (3) Massively bedded (rare)
- Although facies and thicknesses vary somewhat laterally, cycles are generally laterally continuous over large areas and relatively planer.
- The contact between the Yates Formation and the underlying Seven Rivers Formation is gradational because of an overall regional decrease in accommodation as defined by the thinning of marine units and the thickening of eolian units.
- The upper contact of the Yates Formation and the overlying Tansil Formation is relatively sharp. This contact is interpreted to be the result of a larg-scale marine transgression. The carbonate/ anhydrite deposits that mark this flooding event are defined by an obvious gamma-ray log response. Consequently, this contact is used as a regional-correlation marker bed.