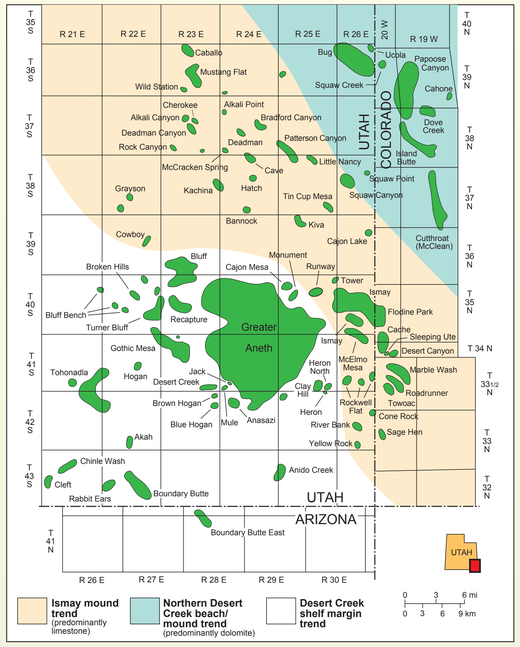
Pennsylvanian Paradox Formation Reservoir, Paradox Basin – Outcrop Analogs along the San Juan River

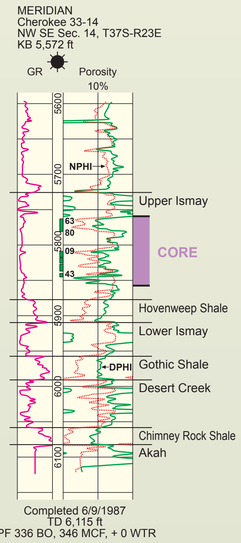


Map of Paradox Formation play area and fields within the Ismay and Desert Creek zones producing trends, Utah and Colorado.

PARADOX FORMATION RESERVOIR CHARACTERISTICS

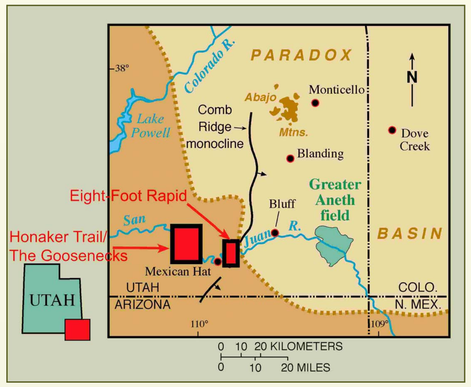
- Net pay – 9 to 57 ft (3-17 m); 165 ft (50 m) at Greater Aneth field
- Primary producing zones – Ismay and Desert Creek
- Depositional environments – shallow-shelf and shelf-margin marine, carbonate buildups (phylloid algal and bryozoan mounds), oolitic banks, beach, and stabilized grain flats
- Carbonate fabrics – bafflestone, grainstone, packstone, and wackestone (limestone and dolomite)
- Pore types – shelter, moldic, intercrystalline, vugs
- Porosity - averages 8-12%
- Permeability – less than 1 md to greater than 500 md, averaging 25 md
- Diagenesis – early marine cementation, dolomitization (early and late), freshwater dissolution and cementation, and anhydrite and bitumen plugging

Type Log

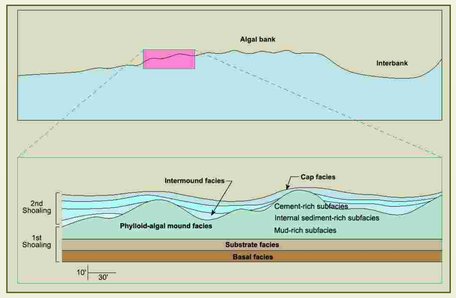


Typical gamma ray-compensated neutron-litho density log of the Paradox Formation, Cherokee field, San Juan County, Utah.

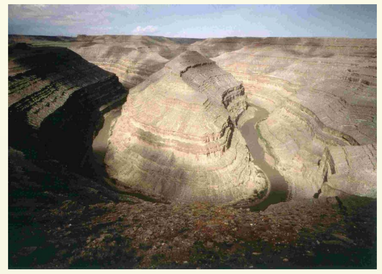
PARADOX FORMATION OUTCROP CHARACTERISTICS



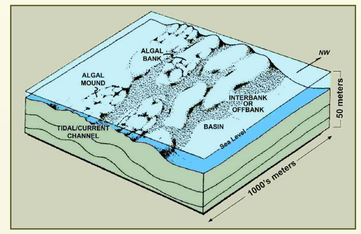
Location of Paradox Formation outcrops in the Eight-Foot Rapid area and The Goosenecks/Honaker Trail, San Juan River, southeastern Utah.



Paradox Formation algal bank/mound topography, morphology, and facies relationships as seen along the San Juan River, Utah (from Brinton, 1986).



Goosenecks of the San Juan River. Photograph by Tom Till, courtesy of the Utah Travel Council.



Schematic diagram of Paradox Formation algal banks (from Brinton, 1986).

Ismay zone algal banks near Eight-Foot Rapid

Stacked complex of four phylloid-algal mounds in the Akah and Barker Creek zones of the Paradox Formation, river mile 39.8.

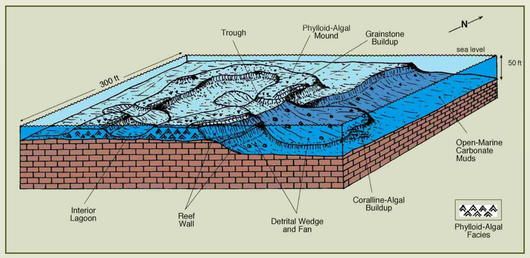
Photomosaic of a large phylloid-algal mound complex composed of algal bafflestone, skeletal grainstone, and packstone in the Barker Creek zone of the Paradox Formation, river mile 40.5.

Typical cement-rich algal bafflestone exposed in a phylloid-algal mound, Ismay zone, Eight-Foot Rapid area. Original sheltered pore spaces were filled with mud; cement rinds are developed around algal plates.

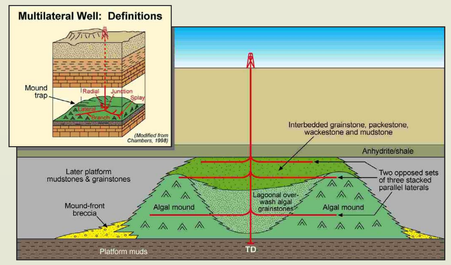
Well-developed cross-bedding in peloidal and oolitic grainstone in the cap and intermound facies of the Barker Creek zone of the Paradox Formation along the Honaker Trail. Close-up shown in inset photo.

Mound flank material – part of the large phylloid-algal mound complex in the Barker Creek zone, river mile 40.5.

Flooding surface (4th-order sequence boundary), Ismay zone along the Honaker Trail. Note abundant intact and fragmented productid brachiopods in the medium gray limestone matrix.



Block diagram displaying depositional interpretation of a mound complex and associated features in the Eight-Foot Rapid area. This interpretation is a composite of inferences made from outcrop and subsurface data.



Schematic diagram of drilling targets in a Paradox carbonate buildup by multilateral (horizontal) legs from an existing field well.

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