

STAR Image Interpretation

Well: Blout # 3-5
County: Morton / KA

SEC: 5 TWP: 33S RGE: 42W

Sedimentbody Orientation and Paleo-Transport Direction of the Upper Morrow Sandstone

Report prepared for:
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Oklahoma City, OK

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Baker Atlas

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**Dominion Oklahoma Texas E & P, Inc.
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Project Objectives

- 1. Determine near-wellbore structure including fault identification and attitude.**
- 2. Definition of lithofacies, description of sedimentary structures, and interpretation of depositional environments.**
- 3. Determination of paleo-transport directions and sediment body orientations.**

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Study Process Flow

High-resolution, interactive
image processing including
bedding, fault, and fracture attitude
calculation



Definition of structural dip
for sequence bounded stratigraphic
sequences and distinct structural
domains



Recording sediment structures, bedding contact and
lithofacies characteristics



Characterization of
vertical facies associations



Removing structural tilt



Isolating data related to transport
direction and sediment body orientation



Developing depositional environment model

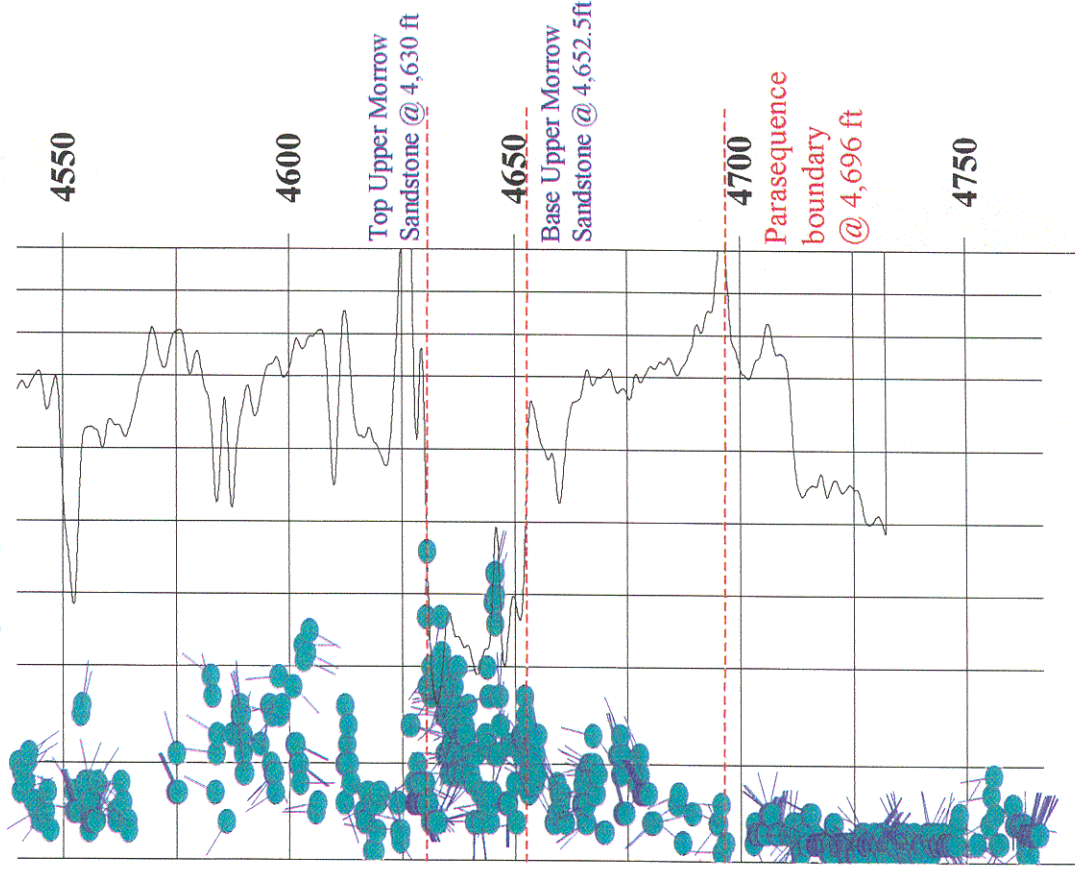
Dominion Oklahoma Texas E & P
 Well: Blout # 3-5
 Field: Greenwood Gas Field
 County: Morton / KA

STAR Image Analysis Structural Dip Definition

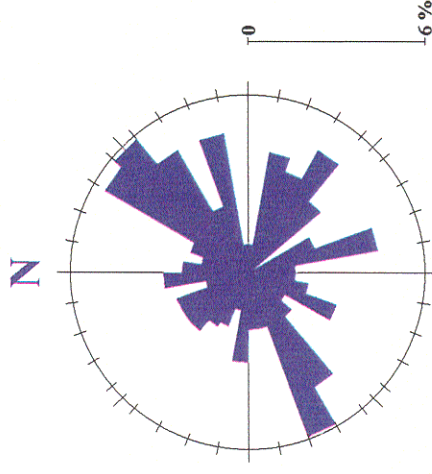


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Bedding Dip Vector Plot



Interval from 4,540 - 4,767 ft



Dip Statistics:

Number of vectors: 631

Structural Dip: n/a

95% Confidence Interval:

Spherical Dispersion:

Dip vector constraints applied:

Dip angel range: visually filtered

Dip azimuth range:visually filtered

A statistical analysis of the bed vectors to calculate the structural dip in the vicinity of the well has not been performed due to tremendous scatter of the data.

Based on visual inspection of the dip vector plot it is assumed that the structural dip in the subject well is less than 1 degree.

From top of the well down to the sequence boundary at 4,696 ft the dip vectors mainly represent stratigraphic features.

Only blue dip vectors were considered in statistical analysis

Diagnostic Sedimentary Structures and Syn-/Post-Depositional Features

Current related sediment structures:

 Horizontal bedding

 Parallel lamination

 Wavy and flaser bedding

 Lenticular bedding

 Cross-bedding (>15 deg.)

 Bi-modal cross-bedding

 Low-angle cross-bed (<15 deg.)

 Over-Steepened cross-bedding

 Differential Compaction

 Abandonment / Differential Compaction

 Scour surface / cut-and-fill

 Erosive basal contact

Biogenic structures:

 Bioturbation

 Rootlets

Soft-sediment deformation structures

 Water escape structure

 Slump structure

 Carbonate concretion

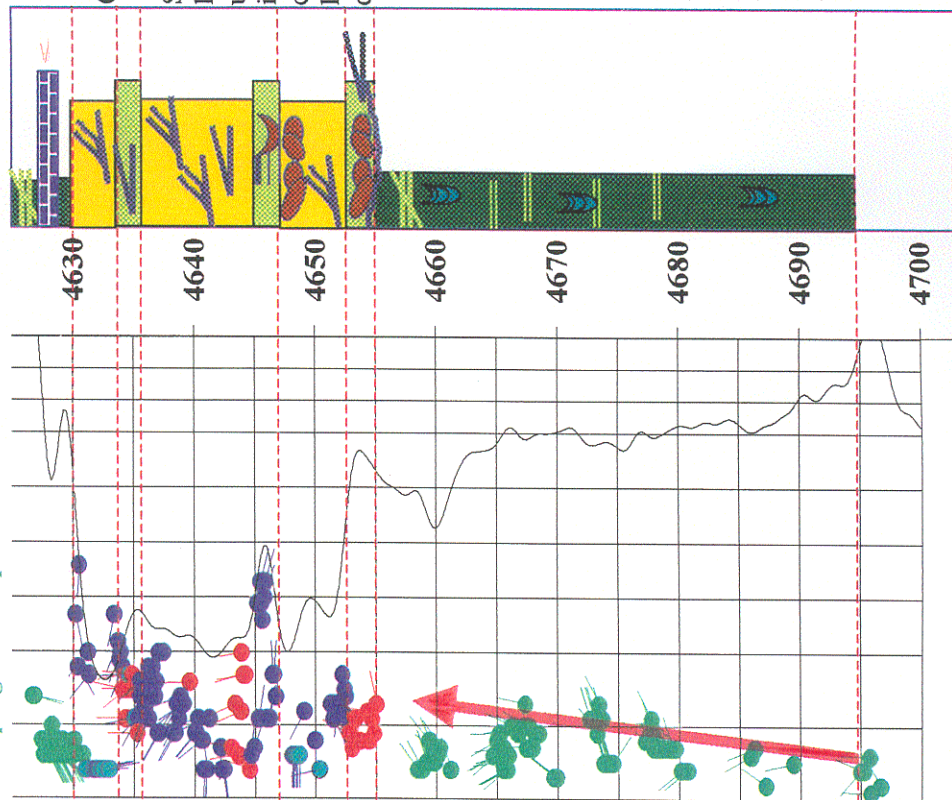
 Conglomerate / debris flow

 Structureless / Contorted

Stratigraphic Dip Analysis Upper Morrow Sandstone 4,630 - 4,655 ft

Stratigraphic Dip Vector Plot

- Accretion surface
- Compaction / progradation pattern
- Cross-bedding / cut&fill
- Unclassified bedding



Channel Sandstone:

Sandstone, erosive base contact, lag deposits with frequent rip-up clasts from 4647 to 4655 ft, in upper part predominantly cross-bedded alternating with lower angle accretion surfaces dipping to the North.

Levee / Flood Basin Deposits:

Siltstone and shales, poorly bedded, occasionally parallel laminated, possibly bioturbated, bedding dip angle appears to increase toward the top in overall cu-sequence;

Paleo-Transport and Sediment-body Geometry

Cross-Bedding / Transport Direction:

Particularly the upper half of the channel is characterized by steep cross-bedding to the WNW. The petal to the ESE was interpreted as cut-and-fill feature.

Accretion Surfaces / Channel Strike:

Low angle bed forms dipping perpendicular to paleoflow direction have been interpreted as accretion surfaces. The attitude of the accretion surfaces suggests channel strike direction to be E10S-W10N. The sand may develop slightly thicker to the South.

Compaction / Progradation Pattern:

The shales and silts below the sand are characterized by gradually increasing dip angle toward the base of the sand. The sedimentological characteristics of these shales recommend levee / flood basin depositional environment. The orientation of these dips suggest SSE - NNW channel strike.

Summary:

Channel striae is about E10S and flow direction to the W10-30N. Based on information provided by accretion surfaces the sand should develop slightly thicker to the South of the subject well.

