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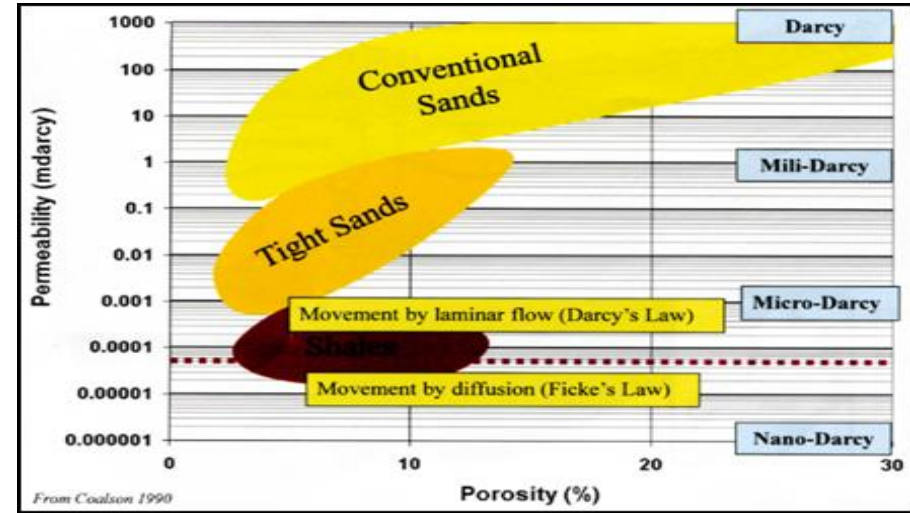
PETROLEUM POTENTIEL OF TIGHT SAND IN ALGERIA BASIN

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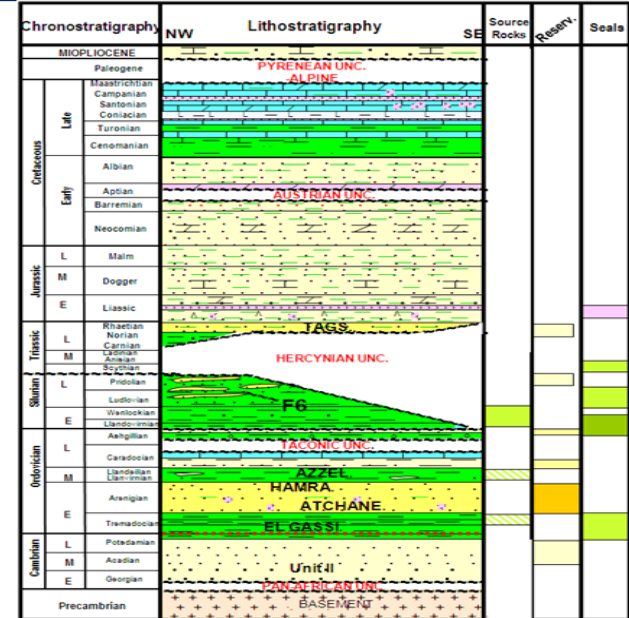
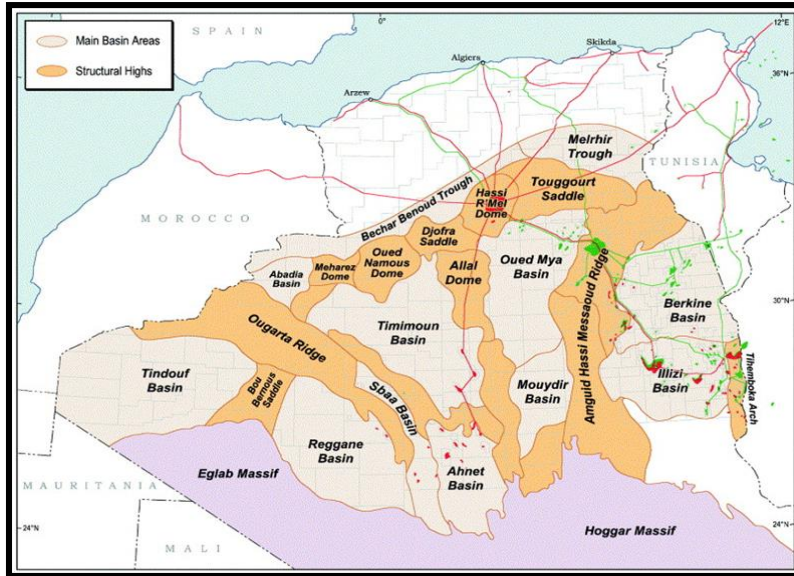
INTRODUCTION

- Tight sand reservoirs are generally defined as having less than 0.1mD matrix permeability and less than 10% matrix porosity.
- Such reservoirs cannot be produced at economic flow rates unless the well is stimulated by a hydraulic fracture or produced by a horizontal wellbore.



Cross-Plot PHI/K

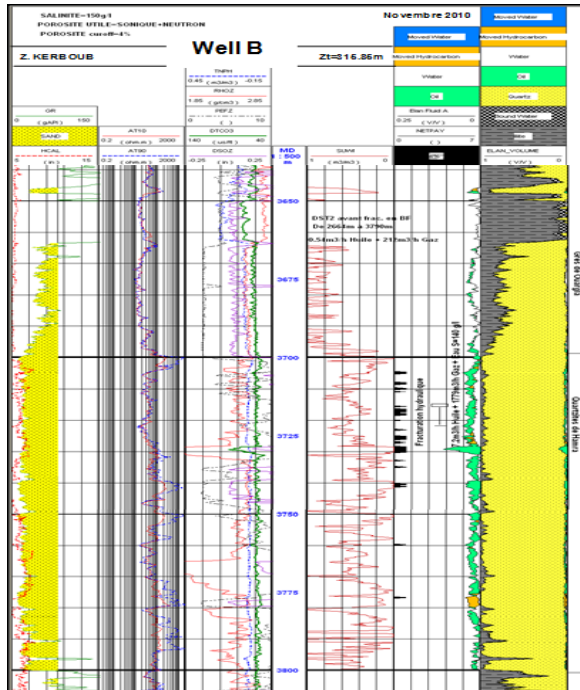
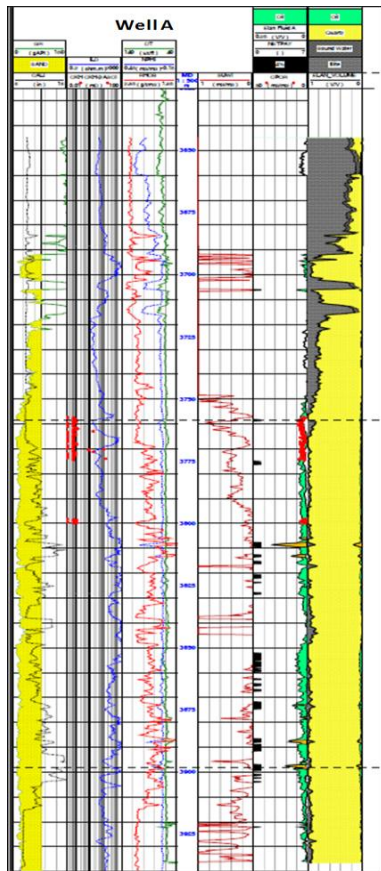
ILLIZI BASIN CASE STUDY



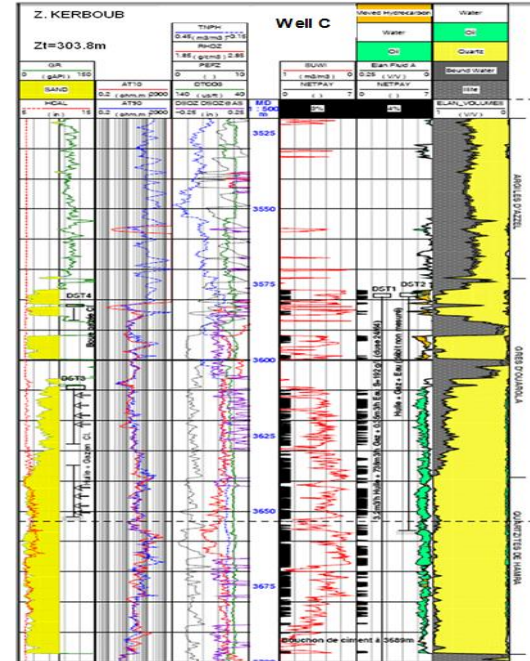
- The Ordovician Hamra Quartzites reservoir is made of medium to coarse quartzitic sandstone.
- It represents one of the best prolific reservoir in Illizi basin

ILLIZI BASIN CASE STUDY

shows
of gas
&
oil



Hydraulic fracture successful
Improved the flow of gas & oil
thirteen times.

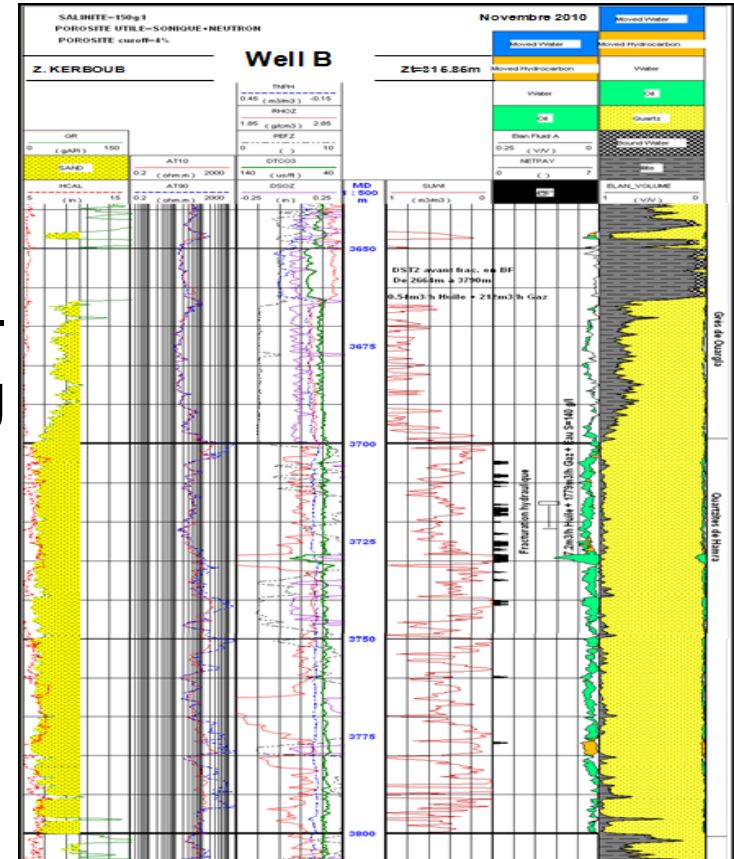


Small amount of gas, oil and
water flowed.
Fluid contact uncertainty.

ILLIZI BASIN CASE STUDY

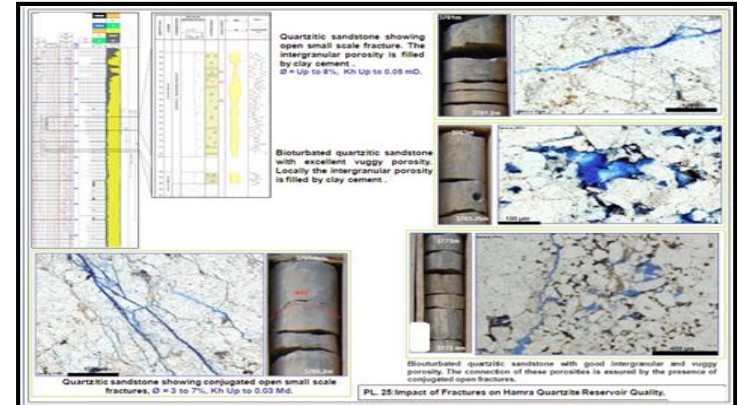
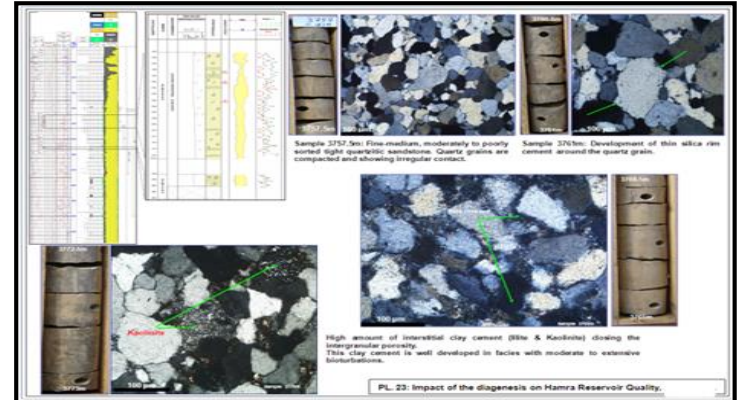
The Hamra Quartzites reservoir is mainly characterized by:

- Thick clean fine to medium-grained sandstones with a strong silica cementation.
- High resistivity
- Low porosity



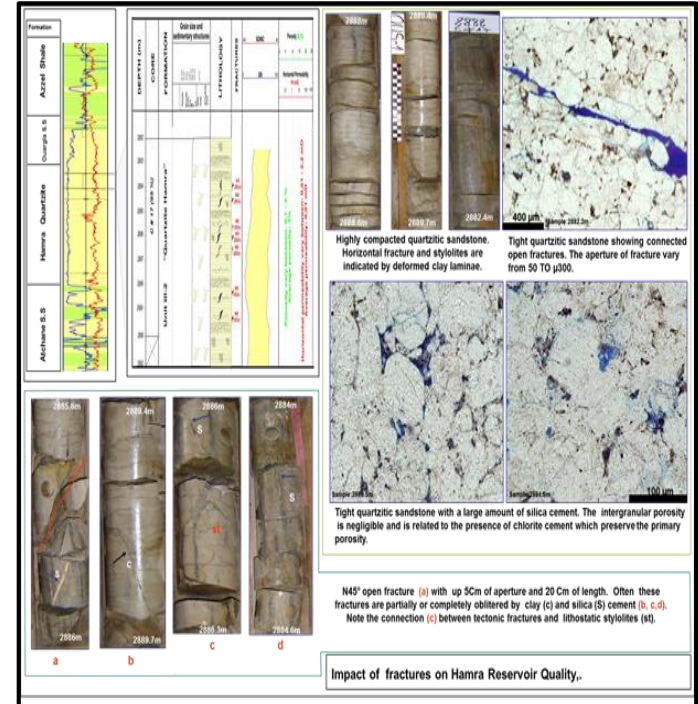
ILLIZI BASIN CASE STUDY

- Pore morphology is dominated by extensive diagenesis, resulted in porosity reduction by silica cementation, some clay, carbonate, and pyritic cement.
- Development of a secondary porosity, associated with feldspar dissolution is observed.



FRACTURE NETWORK CHARACTERIZATION

- From fracture study of about 122m cores, fractures (N45° & N10° to N20°) are observed near NE-SW faults.
- Most of these fractures are opened and/or partially filled by silica or clay cement.
- The fractures N45° tend to enhance the flow.



FORMATION EVALUATION UNCERTAINTIES

- Formation water resistivity R_w .
- Formation pressures and fluid contacts.
- Core measurements are affected by the stress relief.
- The cementation factor decreases with decreasing porosity and leads to lower the water saturation.
- The porosity determination is difficult due to matrix changes, incomplete invasion and clay presence.
- Archie equation breaks down at very low porosities.

LOGGING PROGRAM RECOMMENDATIONS

Some advanced wireline logging allows reliable formation evaluation as:

- Accelerator neutron porosity logs.
- Magnetic resonance logs.
- Wellbore imaging logs.
- Advanced acoustic logs.
- Advanced wireline formation testers.

An extensive laboratory analysis for Archie parameters is Needed.

CONCLUSION

- The Ordovician target is a promising play in Illizi basin even though it has an extremely poor poroperm property.
- The well formation evaluation of tight sand remains complex and full of uncertainties, that can be reduced by using appropriate parameters, interpretation methodology and logging tools.
- Production of such reservoirs involves in several cases horizontal drilling and/or induced fracture program which is strongly dependant on correct characterization of the natural fracture system and in situ stress conditions.