

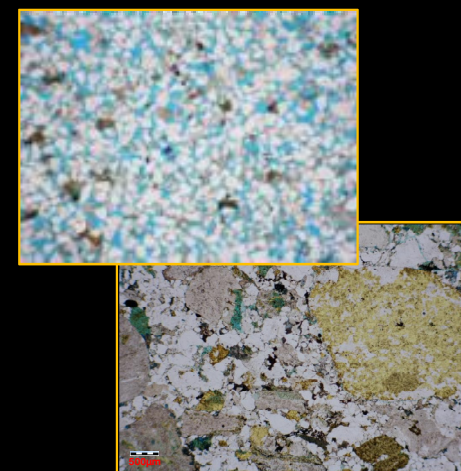
Tectono-Stratigraphic Evolution of the Porcupine Basin:

Observations and Insights from a
New Rock-Based Regional Study

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Edited version of conference ppt



STUDY DATABASE: Rock-Based Reservoir Geology

- **New cyclostratigraphic correlation of all wells incorporating legacy biostratigraphy data - providing a regional rock-based correlative framework**
- **New digital description & photography of all cores (~560 metres of core) providing high resolution (1:20 scale) colour graphical plots and exportable lith/grain-size data**
- **New core & cuttings thin section petrography (15 key wells) combined with legacy data. Also selected SEM/XRD analyses**
- **Rock type characterization of cuttings, providing analogue petrophysical data in uncored intervals**
- **Construction of digital sedimentological logs (SEDlogs) for full drilled succession in all wells – including interpreted depositional environments**
- **New SEAL rock analysis of representative seal horizons in 11 key wells**
- **ArcGIS database showing GDE maps for all sequences (Carboniferous to Late Tertiary) – providing useful calibration and constraint of seismic-based geological models in undrilled areas.**

METHODOLOGY: Fundamental Geology



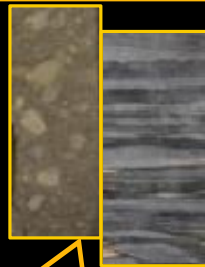
Basement-up reservoir description in all wells (using cores, SWCs, cuttings tied to downhole logs)



Digital entire well SEDlogs



Digital Core Logs

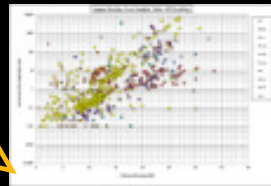


New Digital Core Photos

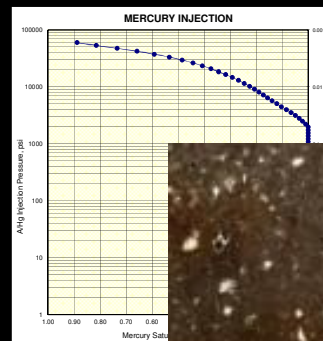
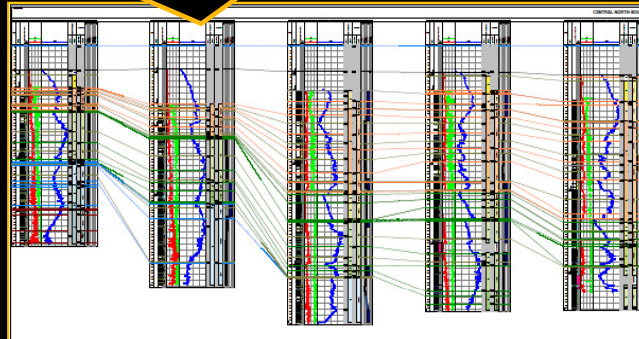
New & Legacy Petrography



Legacy Petrophysics



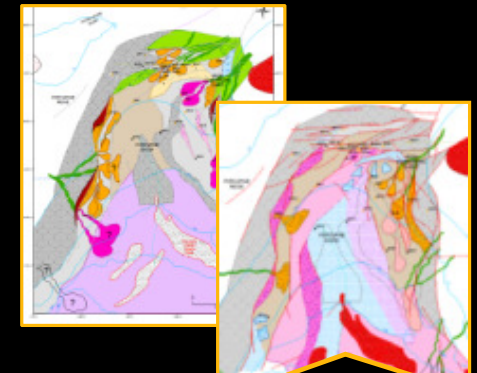
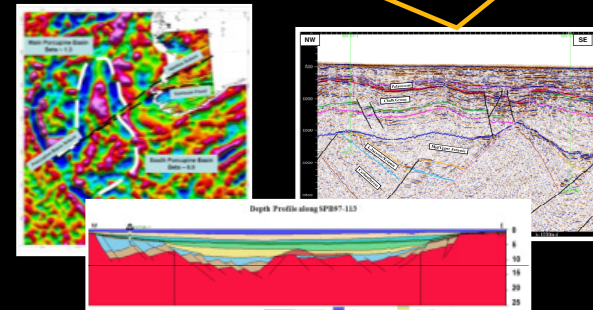
New Correlative Framework (legacy biostrat + new cyclostratigraphy)



Seal Rock Analysis



REGIONAL CONTEXT
Integration of well data with structural framework



ArcGIS GDE maps for each mappable sequence

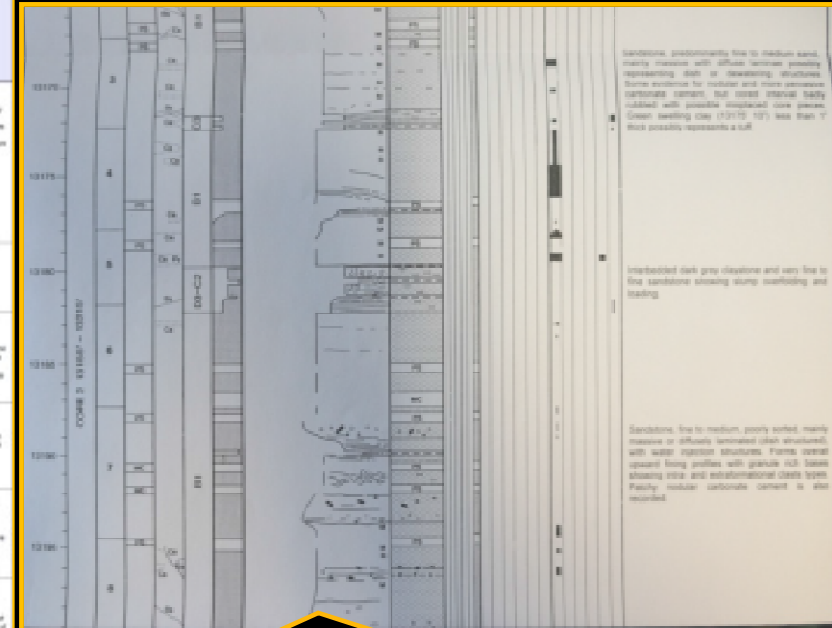
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SEDIMENTOLOGY: New Digital Core Logs

- Graphical full colour displays at variable scales (1:20 plots in thin-bedded reservoirs)
- Lith and grain-size data in ascii format for importing into seismic/log software
- Integrated stratigraphic surfaces/sequences
- Integrated poro-perm
- Facies codes and colour-coded depositional environments



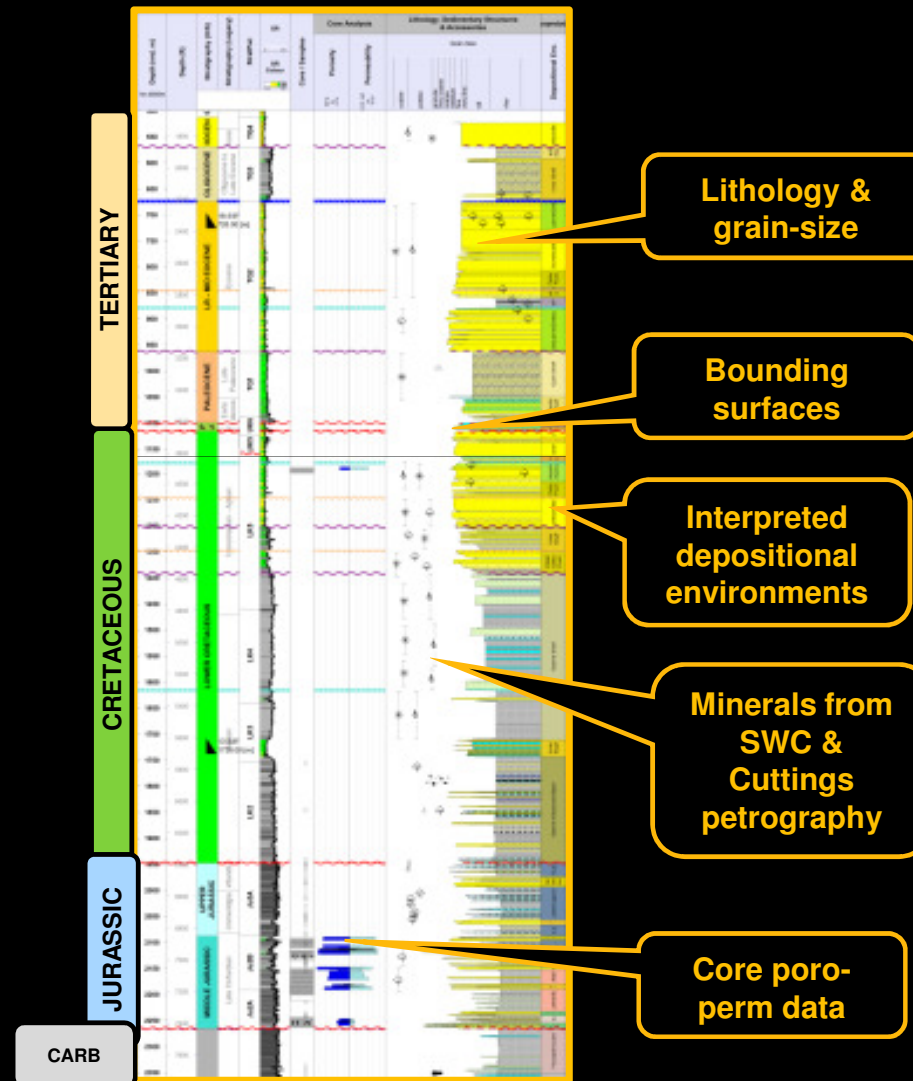
New fully digital core descriptions allow full integration with other geological well data sets & also permit detailed representation of important mineralogical variations (e.g. formation damage-prone pyritic zones)



Legacy core descriptions in hand-drawn B/W paper formats, usually 1:40 or 1:50 scale (scanned images). Difficult to extract grain-size, lithology & depositional environment data from these plots.

SEDlogs for full drilled succession in each well

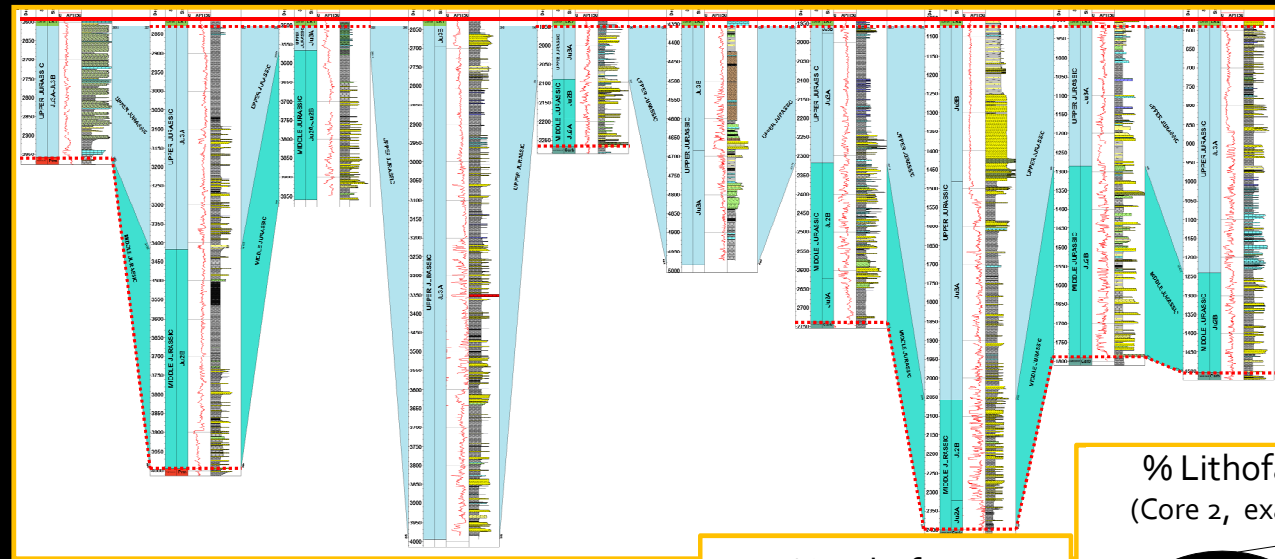
- Graphical full colour displays of full drilled succession – bitmap and PDF formats (*constructed by integration of core, SWC & cuttings data with downhole logs*).
- Lith and grain-size data - exportable in ascii format for integration with log/seismic models
- Integrated stratigraphy including colour coded StratPacs and major bounding surfaces
- Integrated mineralogy from cuttings petrography
- Interpreted depositional environments
- ODM database- providing well to well correlations & statistical lith/facies data



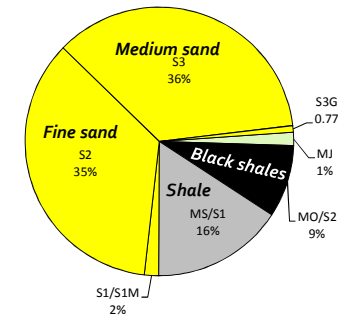
Standardized & Integrated ODM Database



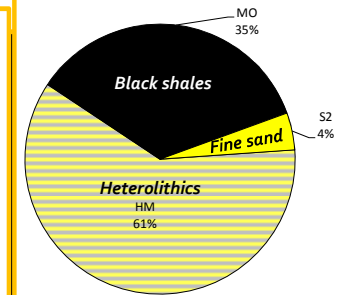
- Well to well correlation panels for each stratigraphic package
- Thickness tables per sequence
- Lith & Depositional Environ % Pie-charts
- Poro-perm cross-plots coded by Well/Sequence/Facies



% Lithofacies
(Core 1, example)



% Lithofacies
(Core 2, example)



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