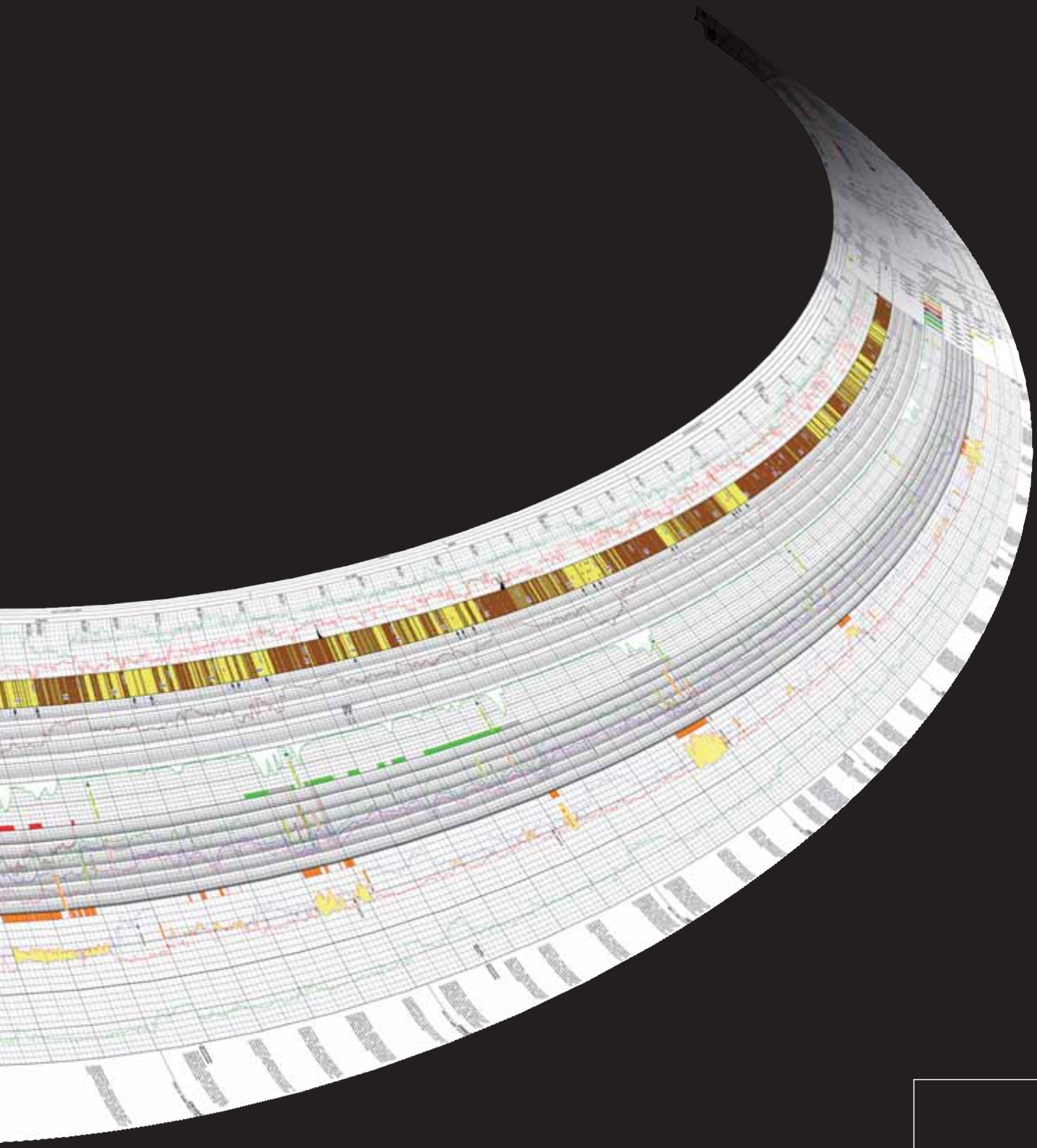
GEOSUITE



Geologix

Introduction

Geologix Limited has served the international oil and gas exploration industry since its inception in 1994. We now work with over 100 customers in more than 40 countries worldwide. Our small, globally-distributed team of geoscientists, engineers and software developers provides systems, tools and solutions which efficiently turn your well data into secure, easily shared information.

This brochure outlines the capabilities and typical usage of the data collation, computation and log authoring programs which constitute our GEO suite of software.

GEO Suite of Software

The GEO Software Suite is an integral part of the information delivery workflow of the operations team. A compact document file (ODF) is authored at the wellsite to capture data, interpret geology and analyse information over an inherent range of log formats. Access the multi-layout document with the free viewer to bring the log alive on any desktop, anywhere.

Bespoke templates provide a company standard for log presentation and automate common display parameters as well as computations and analysis. Zone reports dramatically increase the efficiency of producing morning reports by collating, averaging and cross-referencing information between midnight depths or formation top markers.

WITSML certified technologies enable instant access to real-time data servers thus eradicating time spent formatting and loading files. Interpretations are instantly uploaded for the wider operations group to assess and analyse immediately.

The GEO Software Suite is a modular package that can be customised to suit your operation and budget:

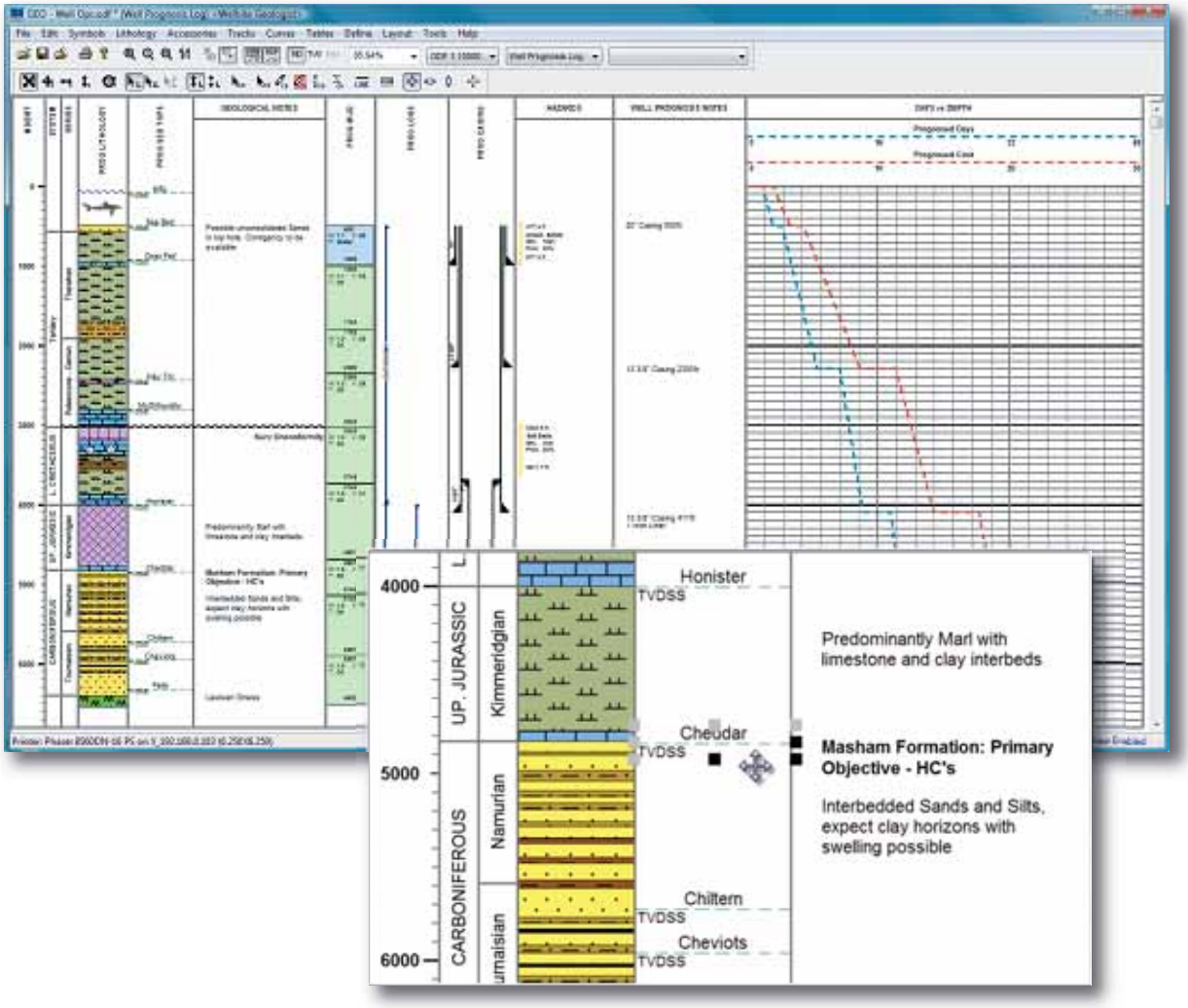
Product Overview

Listed below are the main applications in the GEO Suite of software.

Name	Type	Description
GEO	Log Authoring	Quickly create a range of log displays of wireline, mudlog, and drilling data, interpretive observations & analyses in a single file, with export and import capabilities to other geoscience & engineering applications and corporate data stores.
GEO*Lite*	Log Authoring	Designed mainly for well-site use by oil companies and consultants; same as GEO except that components not essential for well-site operations have been removed to optimize costs.
GEO*Logger*	Log Authoring	Designed as an entry-level package, with optional modules suited for basic log analysis, exporting data, incorporating images, etc.
GEO*Graph*	Graphing	Used for basic cross-plots, trend-line analysis, and well-bore trajectory. Packaged with GEO and GEOLite, but not GEOLogger.
GEOX-*Section*	Multi-well Correlation	Correlate and annotate multiple wells in either structural or stratigraphic sections
GEO*Catalog*	Catalog	Creates a catalog of all GEO log files on your network and local drives for easy access.
GEOe-*View*	Viewer	Interactive log viewer with the ability to change scale, view multiple layouts, convert from MD to TVD, and print a continuous log without page breaks.
GEO*Calc*	Utility	Microsoft Windows based oilfield units conversion calculator.

The flexibility of the software suite allows our clients to easily capture mudlog, MWD/LWD, wireline and test data from disparate sources; this enables the user to create dynamic logs by easily entering, importing, linking, embedding or computing other related information. Based on customer feedback, we have compiled the list below of logs typically generated with our applications:

Well Plan Summary (Prognosed)

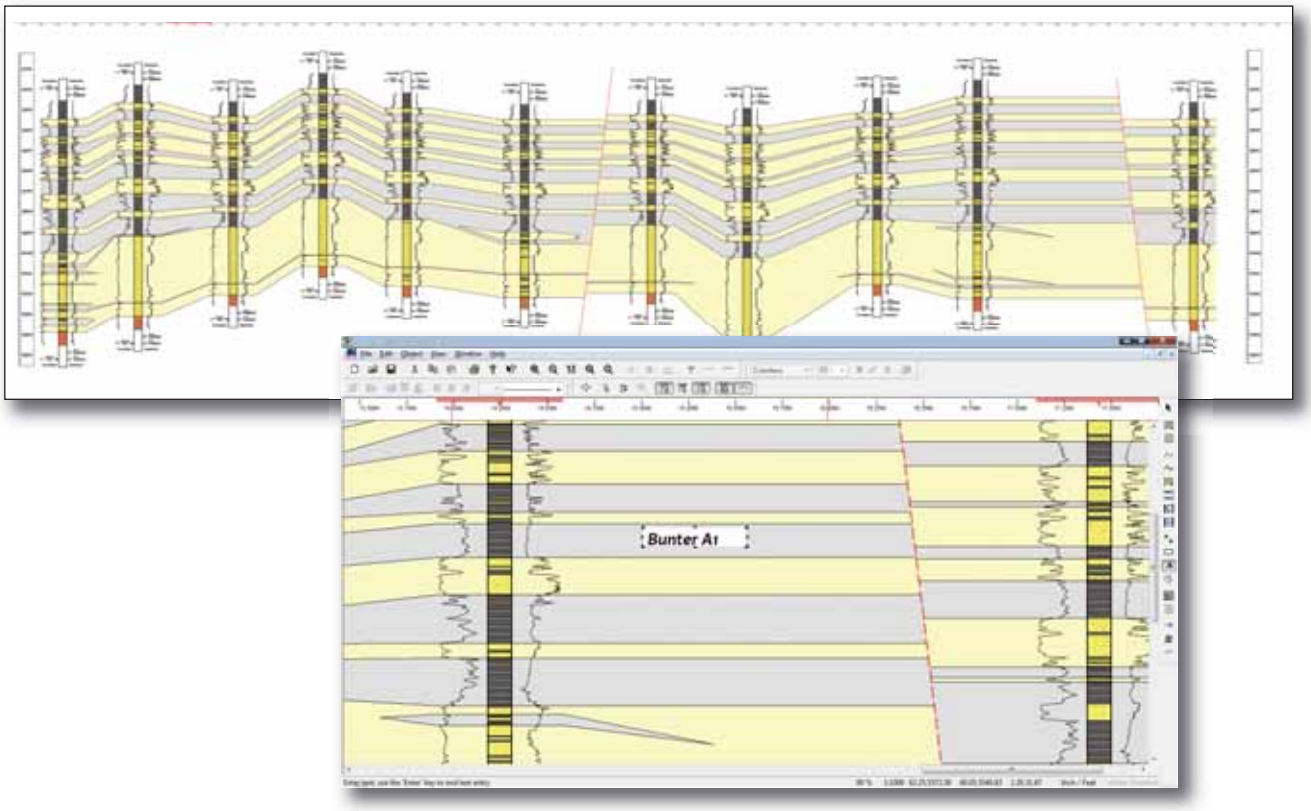


- Stratigraphy
- Formation Tops/Lithology

- Casing/Coring points
- Planned Log runs

- Drilling Progress curve
- Drilling costs
- Other operational flags

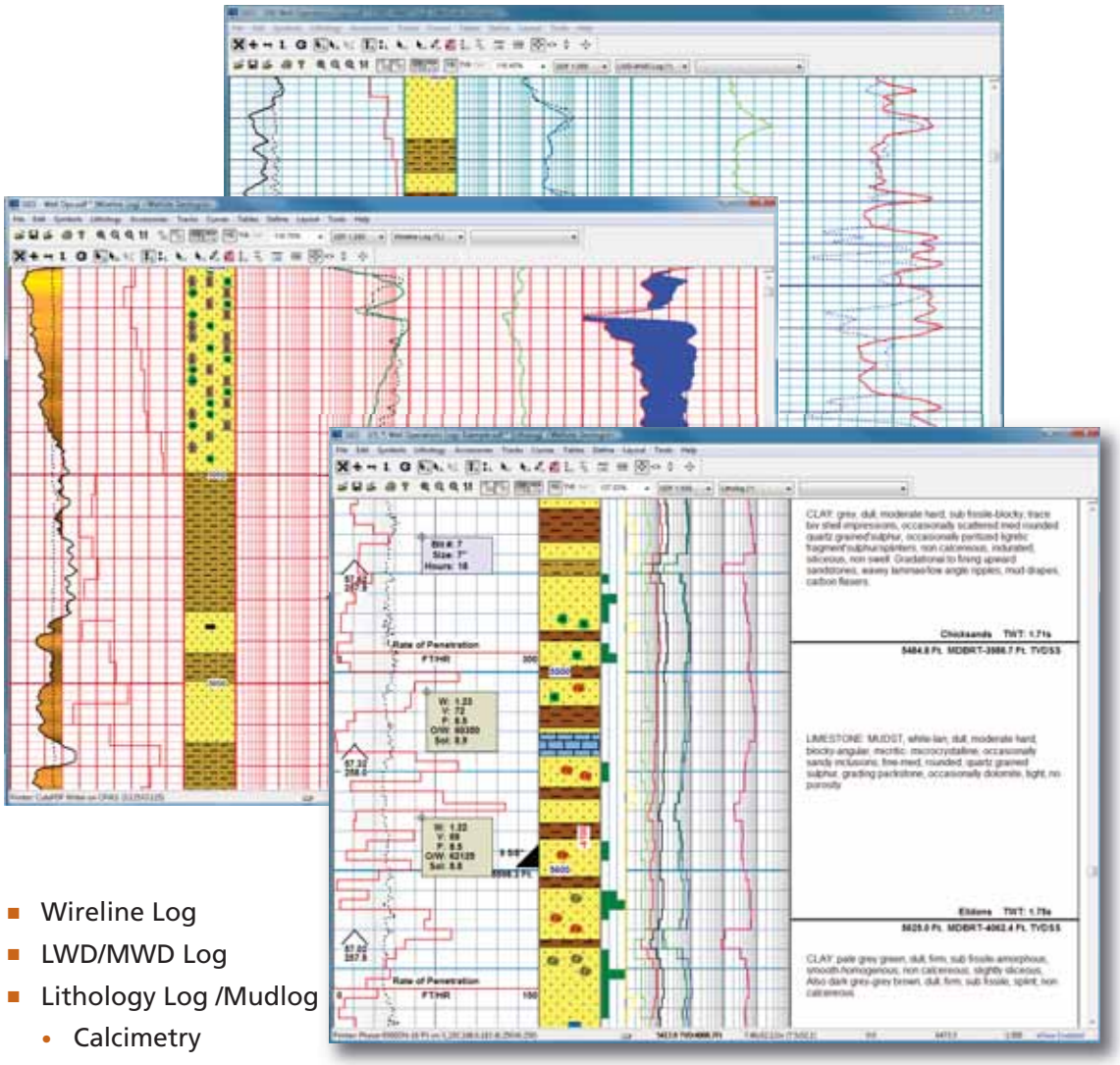
Offset Well Correlations



- Multi-well display
- Display any log curves plus lithology column
- Stratigraphic or Structural correlation modes
- Annotate event markers using text and graphics

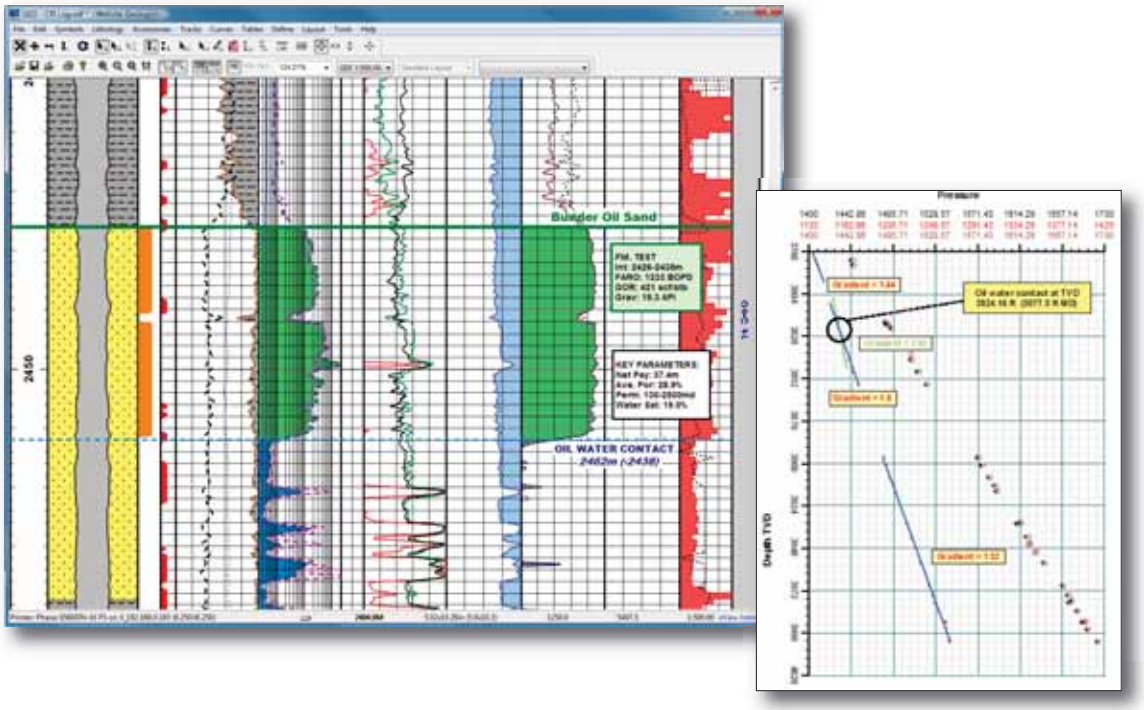
Created with GEOX-*Section*™

Well Operations Logs



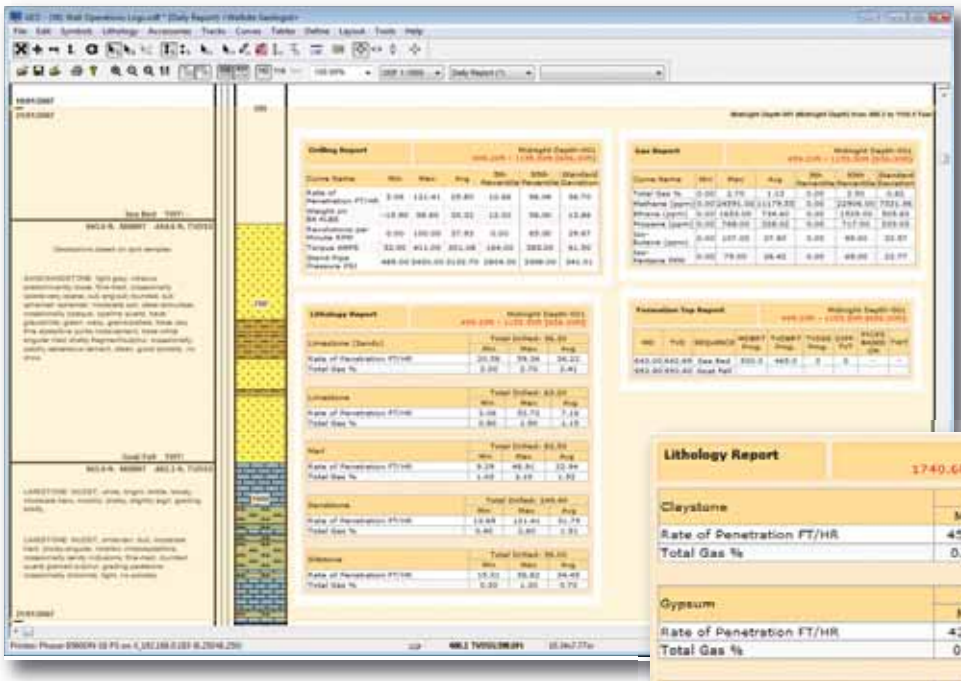
- Wireline Log
- LWD/MWD Log
- Lithology Log /Mudlog
  - Calcimetry
  - Chromatograph readings
  - Geological Interpretation
  - Interpreted Lithology
  - %Lithology
  - Descriptions/cuttings photographs
  - Formation Tops
  - Mud and Drilling Parameters
  - Visual Porosity, Grain Size, Shows

Quicklooks and Log Analyses



- Quicklook CPI & analyses
  - Water saturation (Archie, Simandoux or your equation)
  - Net pay flags
  - Effective porosity
  - Automatic calculations
  - Formation pressure analysis

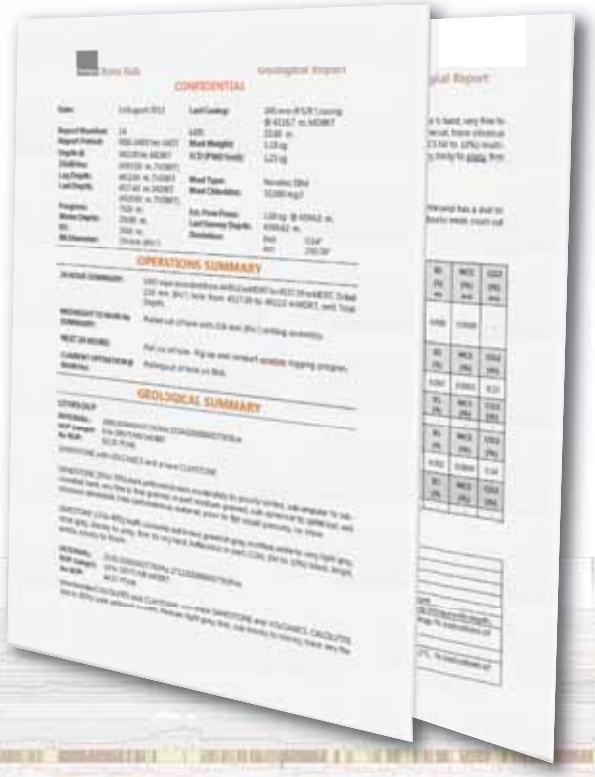
Zones & Zone Reports



Lithology Report — Midnight Depth=002
1740.60ft - 2358.50ft (617.90ft)

	Min	Max	Avg
Claystone — Total Drilled: 22.00			
Rate of Penetration FT/HR	45.02	109.57	76.43
Total Gas %	0.20	0.30	0.23
Gypsum — Total Drilled: 13.50			
Rate of Penetration FT/HR	42.63	49.40	46.37
Total Gas %	0.40	0.50	0.45
Limestone — Total Drilled: 28.10			
Rate of Penetration FT/HR	21.09	54.52	32.95
Total Gas %	0.10	0.40	0.30
Marl — Total Drilled: 222.70			
Rate of Penetration FT/HR	26.84	107.04	48.51
Total Gas %	0.00	1.30	0.41
Siltstone (Calcareous) — Total Drilled: 96.00			
Rate of Penetration FT/HR	23.85	111.68	51.07
Total Gas %	0.10	0.30	0.17
Siltstone — Total Drilled: 235.60			
Rate of Penetration FT/HR	18.77	121.52	47.31
Total Gas %	0.10	1.50	0.43

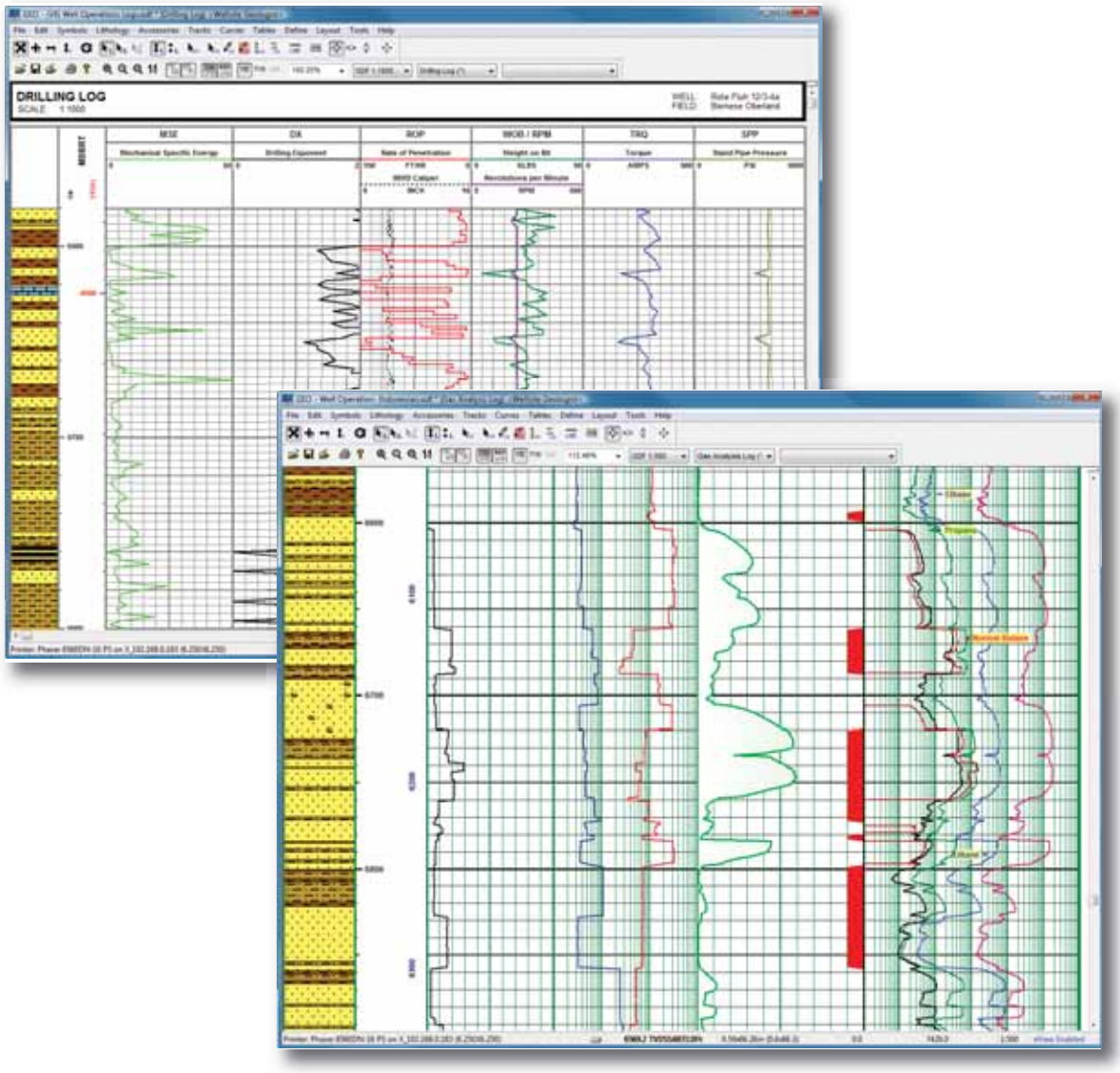
- Zones
  - Define multiple zones per ODF document
  - Zones may be of type: Text; Lithology; Qualitative; Curve; Tables
  - Toggle zone display from toolbar button



- Zone Reports
  - Predefined reports from templates
  - Up to 200 exportable zone reports per ODF document

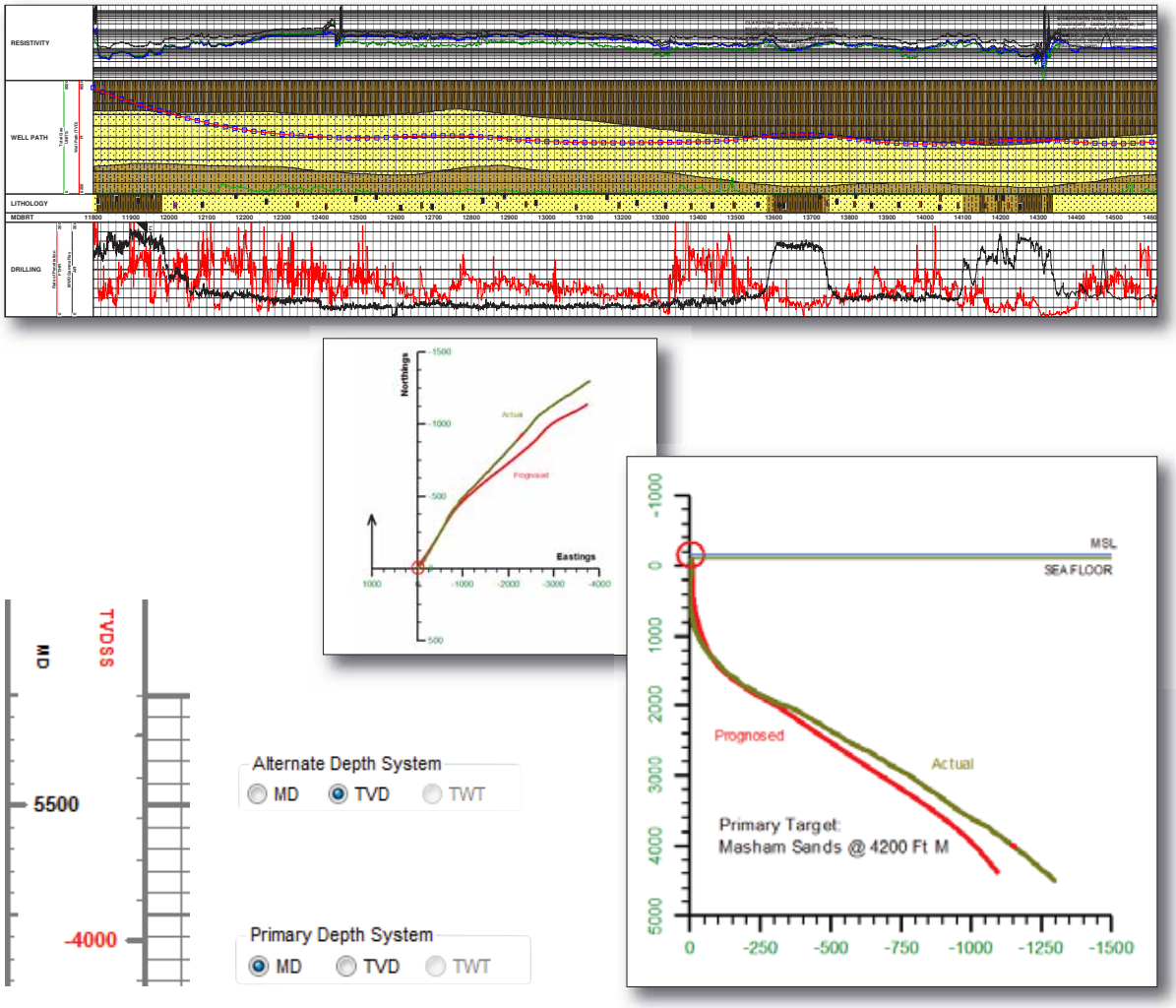
- DGR & EOWR
  - Generate DGR and EOWR from Zone Reports
  - Reports published directly as Word documents

Drilling & Gas Logs



- Drilling Parameters Log
  - Calculate D-Exponent
  - Calculate Specific Energy
  - Display ROP, Torque, RPM, WOB.
  - Display slide/rotate during horizontal drilling
- Gas Logs
  - Gas Ratios (Balance, Wetness and Character)
  - Gas While Drilling

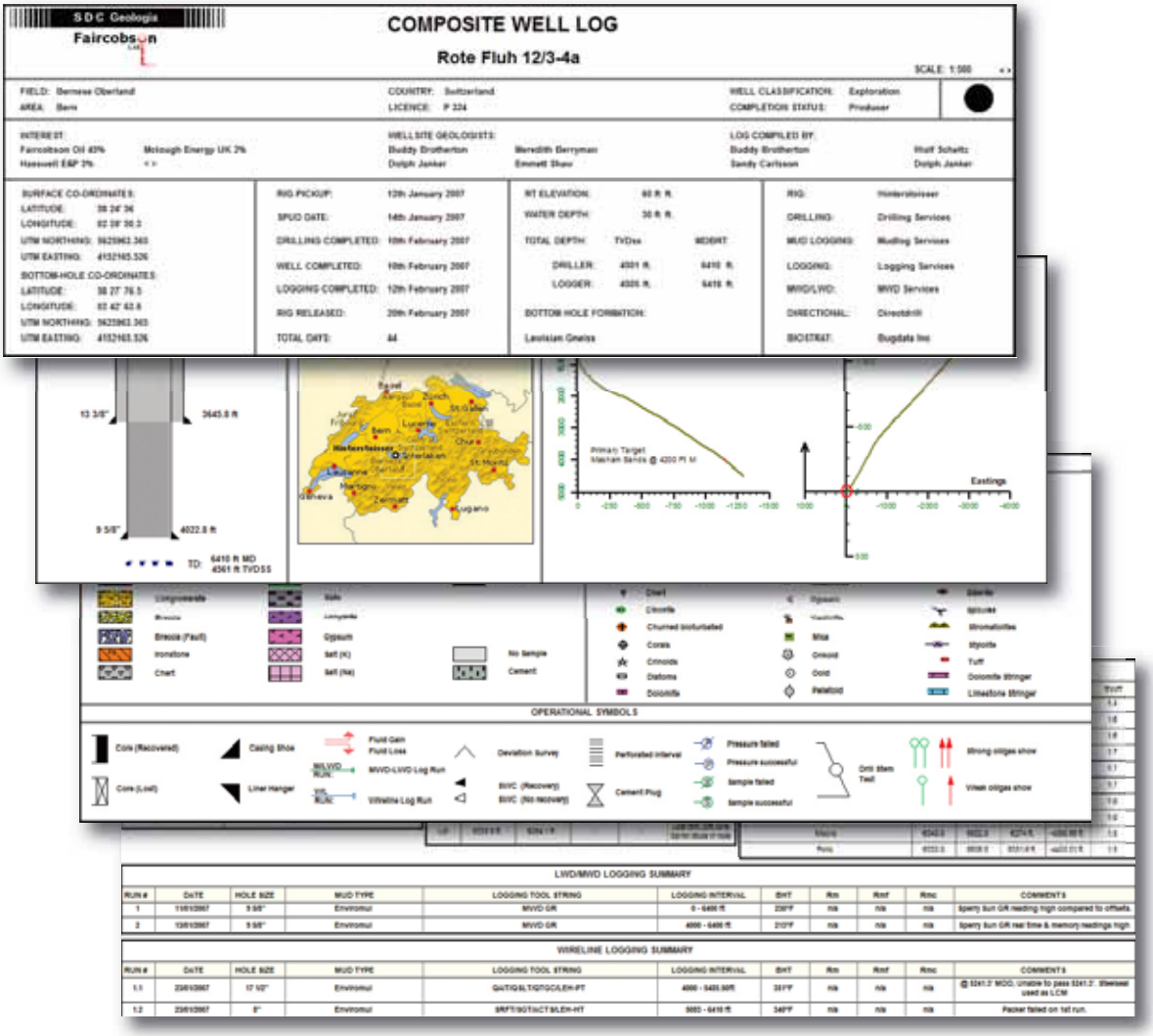
Horizontal Wells & Surface Shaping



- Horizontal Well
  - Create or Import prognosed surfaces or boundaries
  - Monitor actual boundaries and update model in real time
  - Export new surface

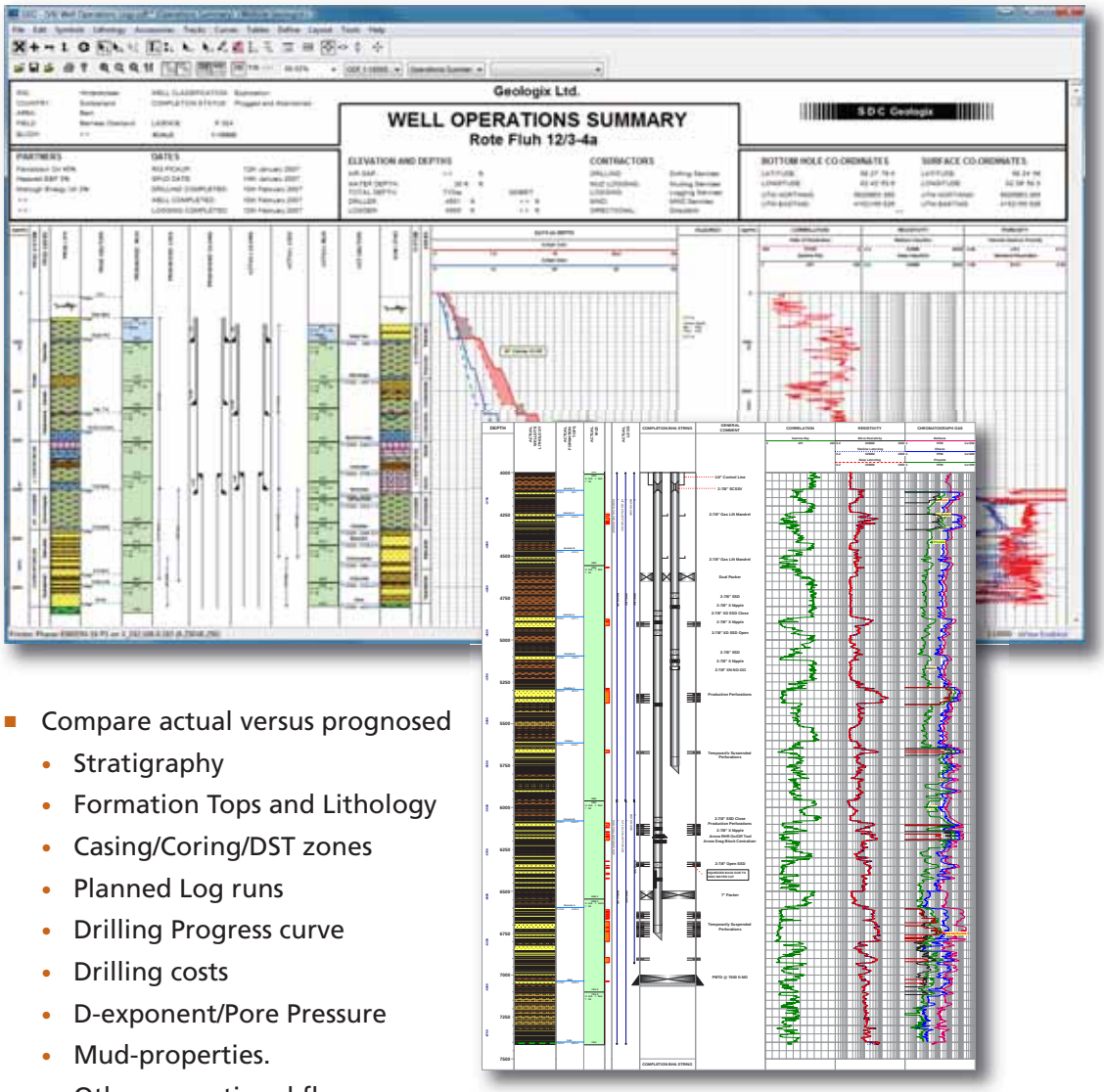
- Directional data and plots
  - Automatic Well Trajectory and Profile plots
  - Automatic TVD calculations using either Minimum Curvature or Average Tangential methods
  - Conversion of plot from MD to TVD
  - Incorporation of Seismic Two-way-time
  - Display plot against TWT and scale to fit seismic peaks.

Composite Logs



- Create headers & trailers with:
  - Well information panel
  - Maps and well sketch diagrams
  - Legends for graphical objects in the plot
  - Tables: casing summary, log-runs, mud details, formation tops and so on.
  - Cross plots, images, sidewall core recovery, pressure test reports, operations summary, etc.

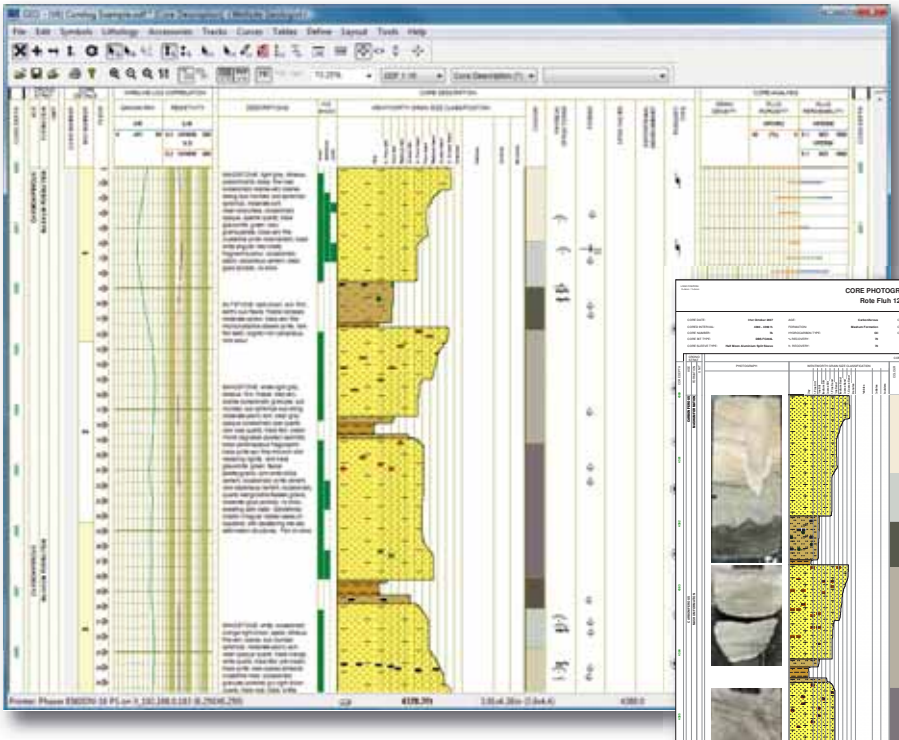
Well Progress & Completion Summary

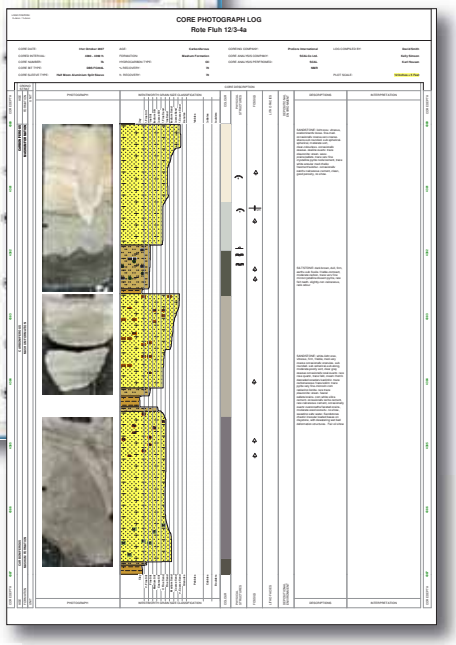


- Compare actual versus prognosed
  - Stratigraphy
  - Formation Tops and Lithology
  - Casing/Coring/DST zones
  - Planned Log runs
  - Drilling Progress curve
  - Drilling costs
  - D-exponent/Pore Pressure
  - Mud-properties.
  - Other operational flags

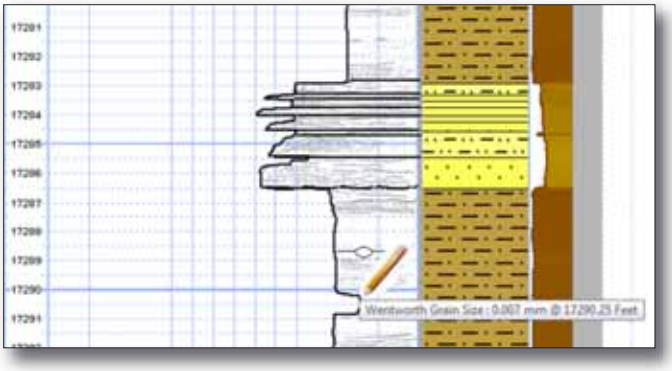
- Create completion diagram
  - Tubing, packers, valves
  - Perforation Intervals
  - Other operational information

Core Log Description & Digitisation





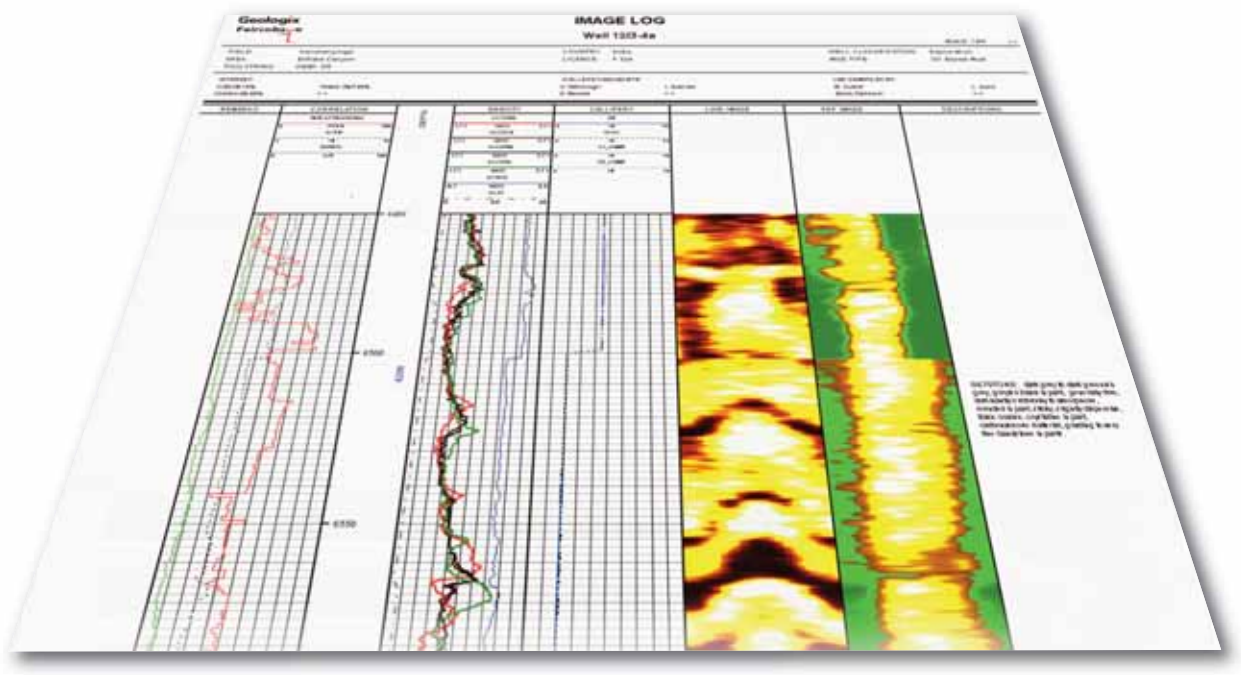
- Core Analysis log
  - Helium Porosity, Permeability, Grain Density
  - Lithology and Structures



- Core Description log
  - Lithology, Structures and Descriptions
  - Core photographs
  - Grain size, Visual Porosity, Shows, Texture

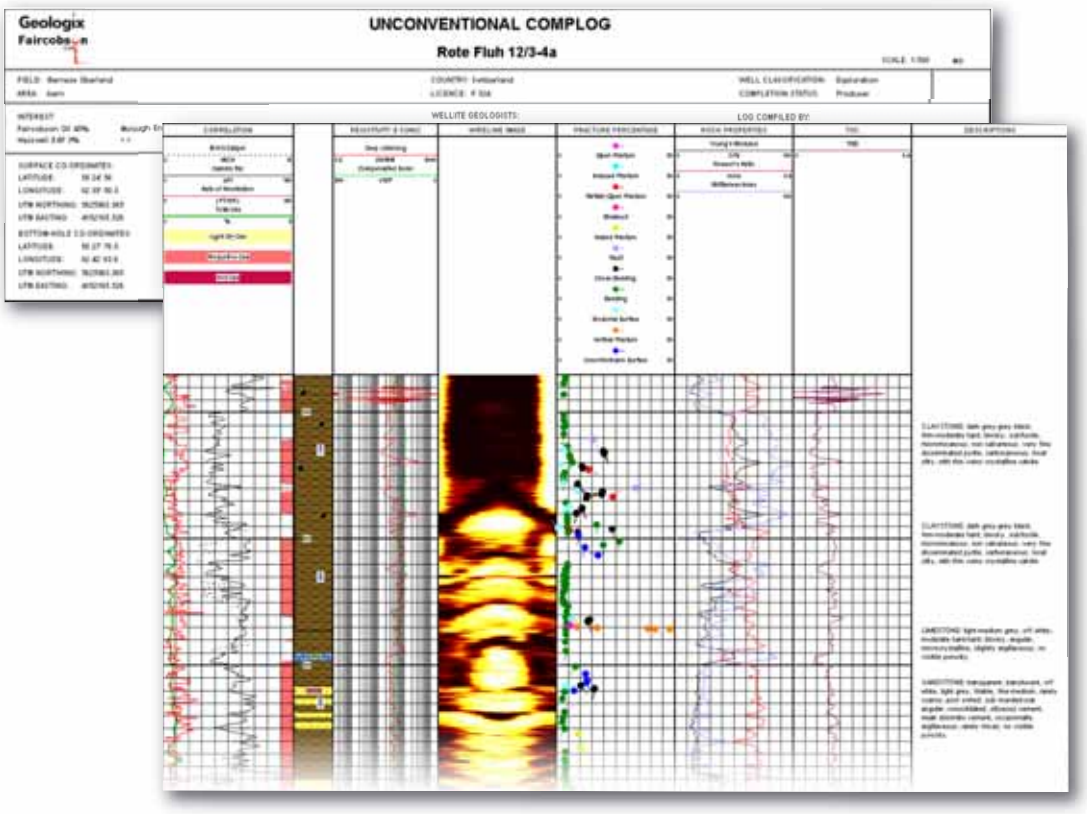
- Digitise Paper Core Logs
  - Trace core profile (clastic & carbonate)
  - Automatically produce grain size data and lithological/facies interpretation
  - Digitise structures, fossils and comments
  - Export all digitised data

Imaging Log Display



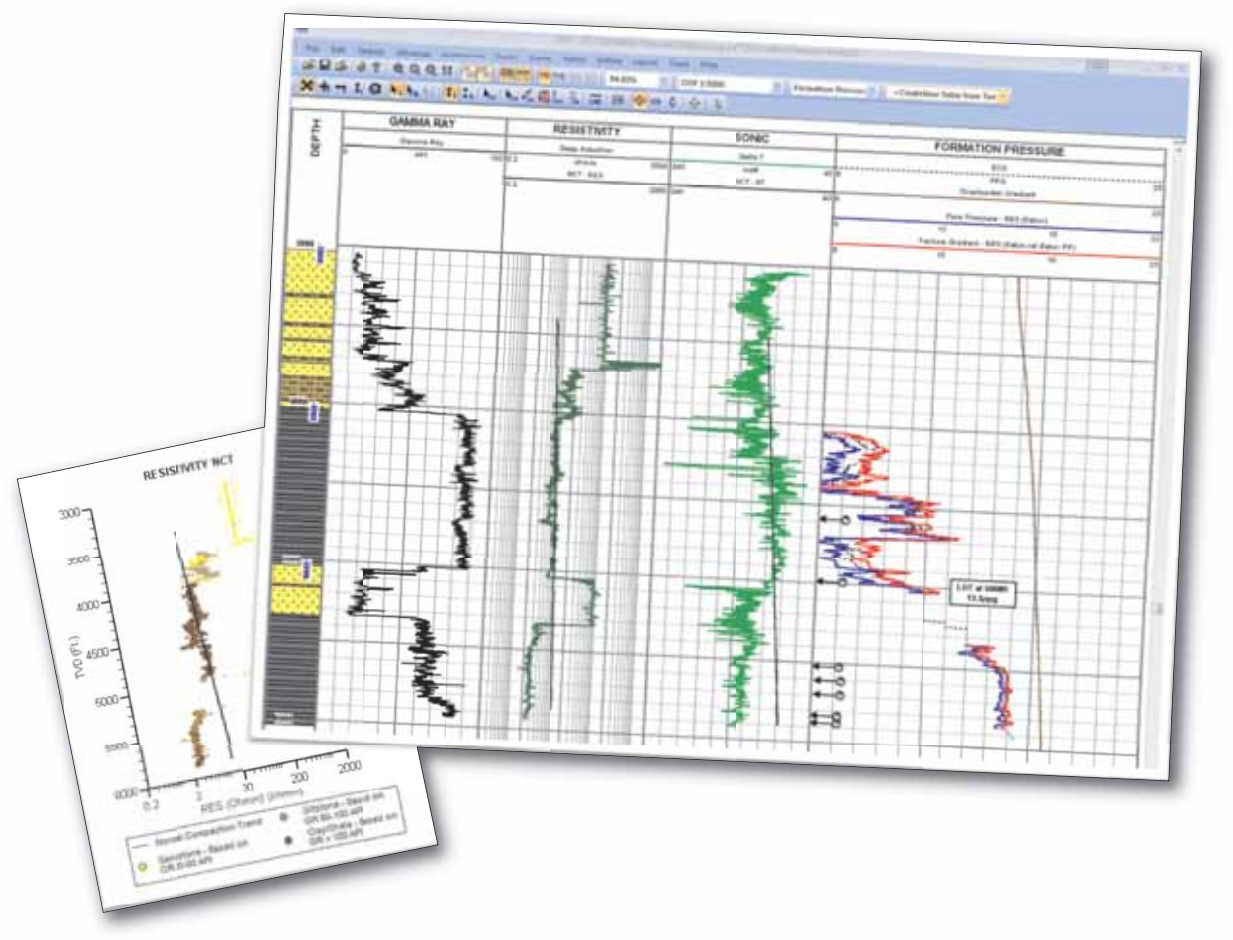
- Imaging Logs
  - Wireline and LWD Image log display
  - Quick to use image tool templates
  - Update colour zones for feature enhancement
  - Load and display raw image data in real time

Shale Gas Well Log



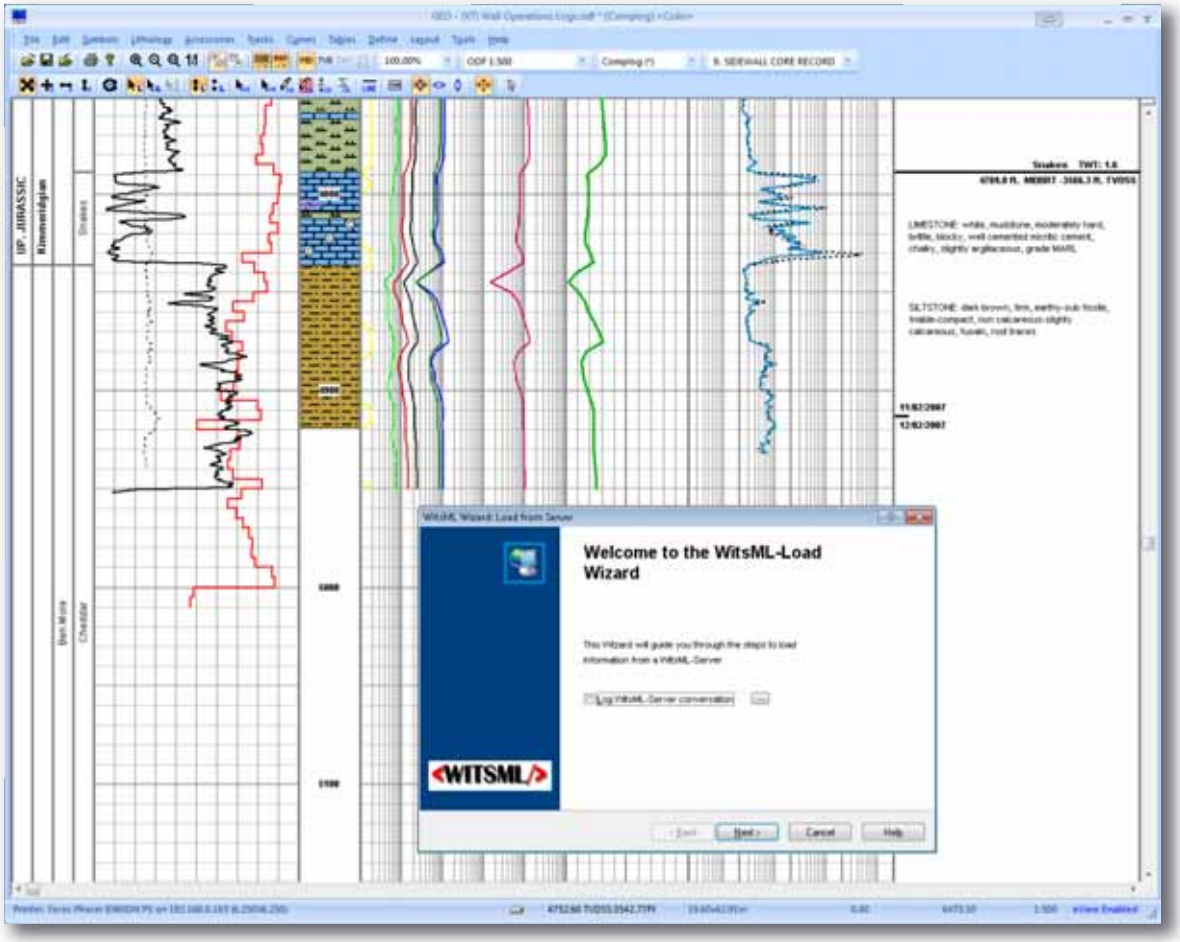
- Shale Gas Well Log
  - Composite log format specifically for shale gas wells
  - Display image log data
  - Calculate Total Organic Carbon & Brittleness Index
  - Display Poisson's Ratio & Young's modulus
  - Display fracture analysis data

Pore Pressure Monitoring



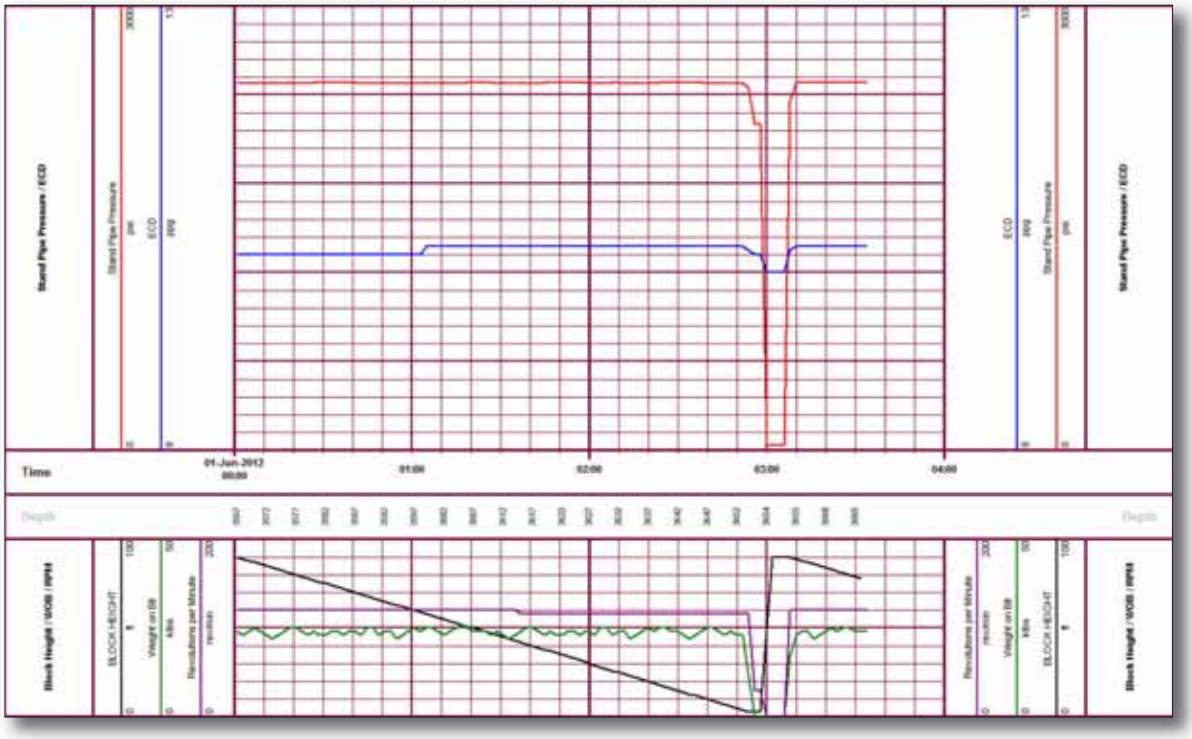
- Pore Pressure Monitoring
  - Interpret NCT in GEOGraph
  - Calculate over burden gradient
  - Calculate Fracture Gradient
  - Calculate Pore Pressure (Eaton/Ratio methods)
  - Monitor Pore Pressure calculation while drilling

Real Time logs



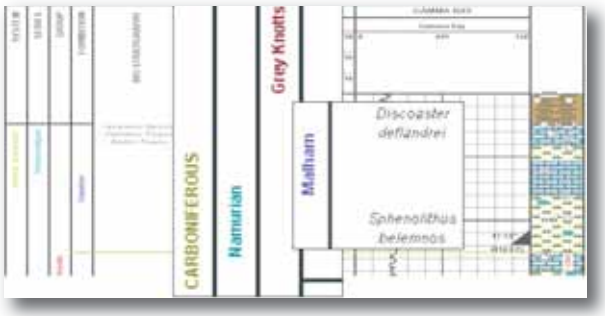
- Real Time logs
  - Automatically load & display Drilling and Logging data in real time
  - Automatically perform calculations in real time
  - Create up to date geological interpretations
  - Upload Mudlog Object to WITSML compliant servers such as geologix's own Wellstore™

Time based Log Displays



- Real-time drilling parameters from WITSML servers
- Log sections
- Circulation logs
- Pressure/temperature logs

Other Log Displays



- Fluid Inclusion Log
  - Hydrocarbon Type
  - Gas Type
  - PTP Strength
- Stratigraphy Logs
  - Chemo-strat
  - Bio-strat

All logs can be enriched by incorporating customized headers and trailers to display tabular information, maps, pictures, logos, charts and spreadsheets to enable the creation of complete documents (ODF files) that can be easily shared via emails, Intranet or even the Internet.

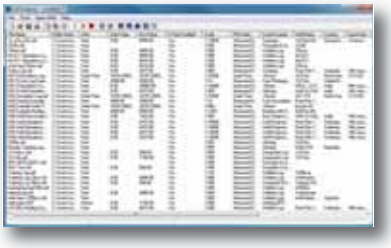
Because the documents contain both the log displays and their constituent data sets, it is very easy for the author to incorporate changes and modify the logs at any time, whether in the comfort of the user's home, while travelling or directly on the corporate network drive. This helps assure the quality of well data and information. Moreover, all depth based logs can be dynamically displayed against TVD or TWT (two way time) at a press of a button; saving valuable time when correlating against adjacent wells or seismic lines.

The single document structure of GEO™ simplifies the creation, organization and sharing of logs.

For example, GEO's WITSML (v1.3.1) import/export utility, GEO*Export*, allows the user to connect to any WITSML compliant system such as those for Schlumberger, Landmark, Paradigm or Baker Hughes for effortless download or upload of well data from GEO™.

Our free viewer, GEO*e-View*™ can be easily downloaded and deployed on a corporate network to provide seamless integration with corporate Intranet, Extranet or website. Once the user has logged on to the system, GEO™ documents can be easily accessed from within Microsoft's Internet Explorer for viewing or printing; saving valuable time spent by log authors in converting plots to compatible formats and log recipients in searching for data and plots.

Similarly, our free GEO*Catalog*™ tool can be configured to query all GEO documents on the company's network drives to create a catalog that can be sorted by Well or Field name, Rig name, Well status and other user-defined fields. The catalog can be accessed by any user on the network.



Typical Workflow

At the Well-site:

Oil company personnel (the well-site geologist or a petroleum engineer) takes the software to the rig to create logs by capturing mudlog/MWD/LWD/wireline data from the service companies on the rig and incorporating computations, interpretations and annotations as desired. The rapid assimilation of data means that oil company personnel spend minimal time and effort in the creation of logs.

Data Consolidation:

The well-site logs are saved as a single, growing document, minimizing the need to manage many files of different types (ASCII, LAS, XLS, DOC, LIS, and so on).

Log Delivery:

The document created by GEO is transmitted daily (or as frequently as required) to the various stakeholders and experts associated with the well, who using our free viewer (GEOe-View), can view and print the log at any time from the convenience of their own PCs and personal printers or workgroup plotters.

Data Transfer:

At any time, throughout the duration of the well and beyond, data is transferred to other systems for detailed formation evaluation.

Data Accessibility:

As long as the GEO documents are stored on a network shared drive, they are instantly available to all individuals with relevant access privileges; and therefore provide an excellent means for keeping all well data and information easily accessible, even years after the end of that well.

Completion Log:

Within seconds of finishing the drilling operations, a draft composite log of the entire well is generated by simply displaying relevant well data in the desired format.

Post-well Wrap-up:

Analysis, depth correction and log finalization is carried out as information becomes available, in order to create a final composite log of the well.

Data Management:

The finalized data is exported from GEO to corporate data-stores (Openworks, Geoframe) electronically, without duplicating data entry into these systems.

Geologix Limited
Rosebery Court
St Andrews Business Park
Norwich
Norfolk
NR7 0HS
UK

Tel : +44 (0)1603 706900
Fax : +44 (0)1603 706901

Geologix Limited
Sampoerna Strategic Square
South Tower
22nd Floor
Jl. Jend. Sudirman Kav 45-46
Jakarta 12930
Indonesia

Tel : +62 21 5795 2588
Fax : +62 21 5795 2589

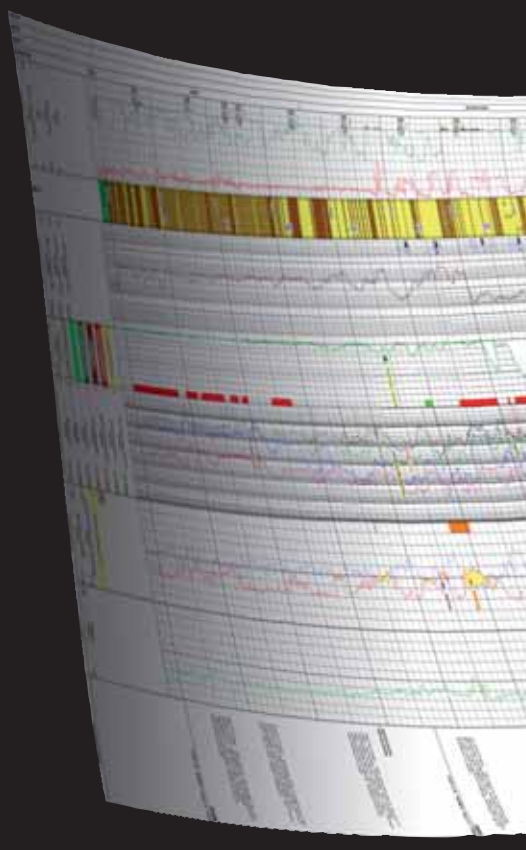
Geologix Services Limited
9801 Westheimer
Suite 302
Houston
Texas 77042
USA

Tel : +1 713 917 6755
Fax : +1 713 917 6806

Geologix Limited
Level 4, Dynasty Building
Andheri Kurla Road
Andheri (E)
Mumbai 400059
India

Tel : +91 22 6786 9171
Fax : +91 22 6786 9199

GEO™



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Capture • Communicate • Collaborate • Complete