

Kingdom™ Geology

An integrated interpretation environment that unravels the complexities of subsurface reservoirs



S&P Global

Commodity Insights

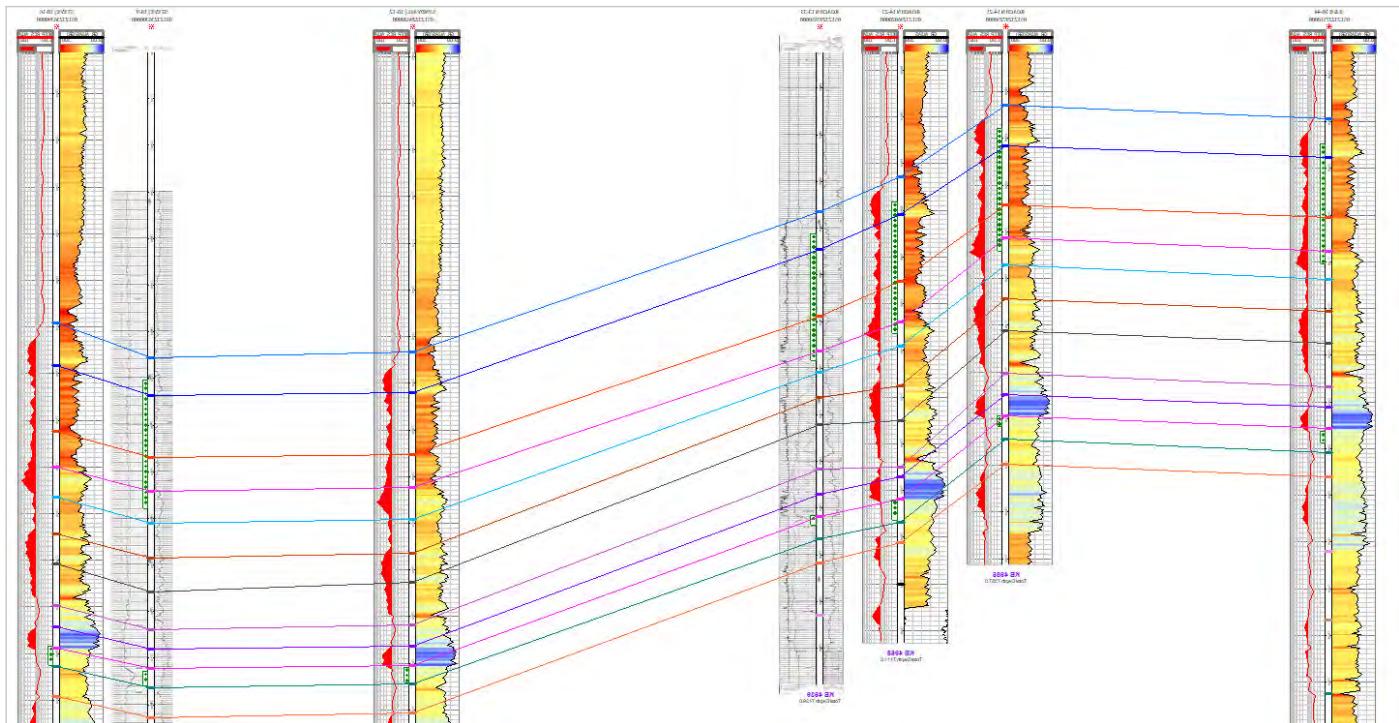
Kingdom Geology from Commodity Insights is a comprehensive toolkit that allows for integrated asset team collaboration, large data volume efficiency, and an integrated interpretation environment to evaluate well data that unravels the complexities of subsurface reservoirs, and helps you plan where to target the next opportunity.

Benefits

- Better Collaboration – One project for multiple scientists. A true multi-user environment that ensures the entire asset team is working on the latest data and interpretation.
- Higher Productivity – Work smarter with the benefit of a new modern and intuitive interface and user experience. You can reduce cycle time by half with streamlined workflows, increased performance with large projects, and reduce bottlenecks through shared data and workflows.
- Ease of Use – Kingdom allows for more time spent on geoscience and engineering versus learning how to use your software. Built-in access to The Learning Center provides a one stop portal for training, videos, tutorials and documents.
- Sophisticated Data Management – Spend less time managing data and more time interpreting data. Optimized to perform on data sets of all sizes, this platform won't slow you down even on regional scale seismic and well sets.
- Lower Cost of Ownership – Save an average of 6 times the cost over the nearest competitor as Kingdom increases performance and scalability while lowering the cost of high technology software and systems.

Capabilities

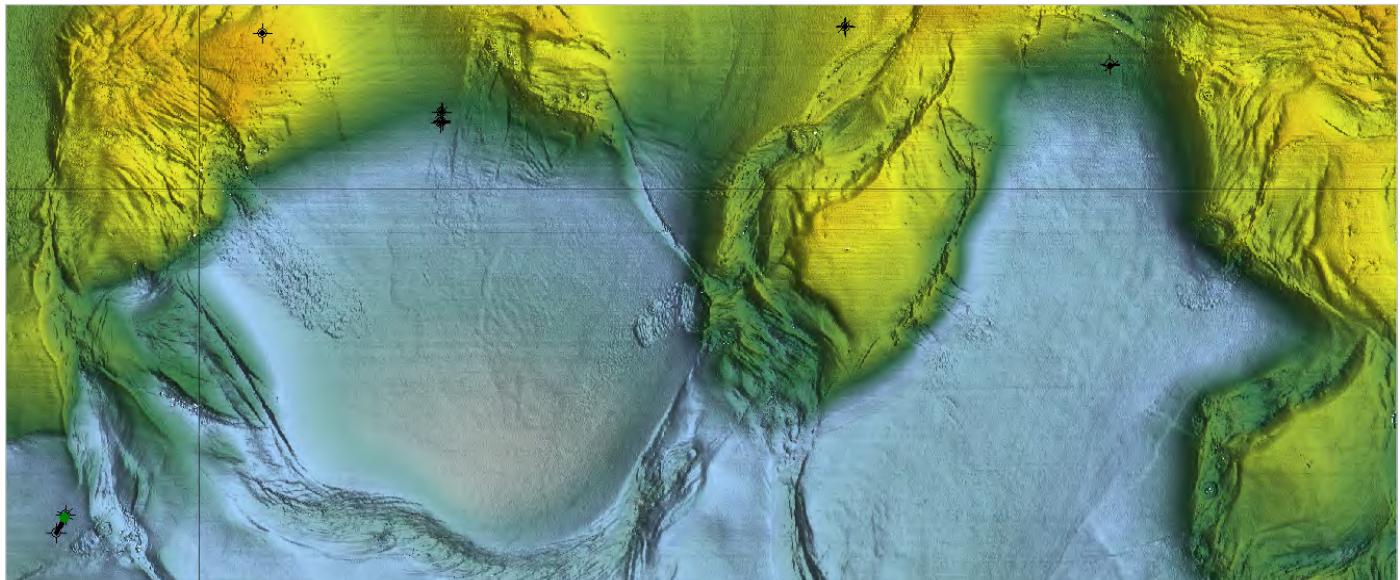
- Allows structural and stratigraphic interpretations from regional exploration to detailed development including well planning, geosteering and field management.
- Supports multiple cross sections that are easy to create and manipulate for picking formation tops with and without seismic overlays, perforations, cores, production data and other borehole information.
- Scalable to very large well and culture data sets and allow posting attribute and bubble maps, log signature maps and highlight wells using multiple colors and symbols.
- Enables easy creation of accurate maps and contours with innovative algorithms such as the patented Flex Gridding.
- Supports multi-author collaboration allowing large teams to work in a single project while tracking authorship and updates.
- New state-of-the-art machine learning techniques to predict logs, formation tops and digitize raster logs.
- Advanced data analysis with Analytics Explorer for TIBCO Spotfire® provides an interactive connection between the Spotfire analytics engine and the Kingdom databases.
- Windows based, easy to use tool that combines all the capabilities needed for an advanced field evaluation.
- Offers advanced science for evaluation of key reservoir types such as Carbonates, Deep Water and Unconventional.
- Leverage geophysical and engineering interpretation within the same project database to help you make better, collaborative decisions.
- Easily define model layers and properties in Dynamic Map Update and Property Modeling.



Features

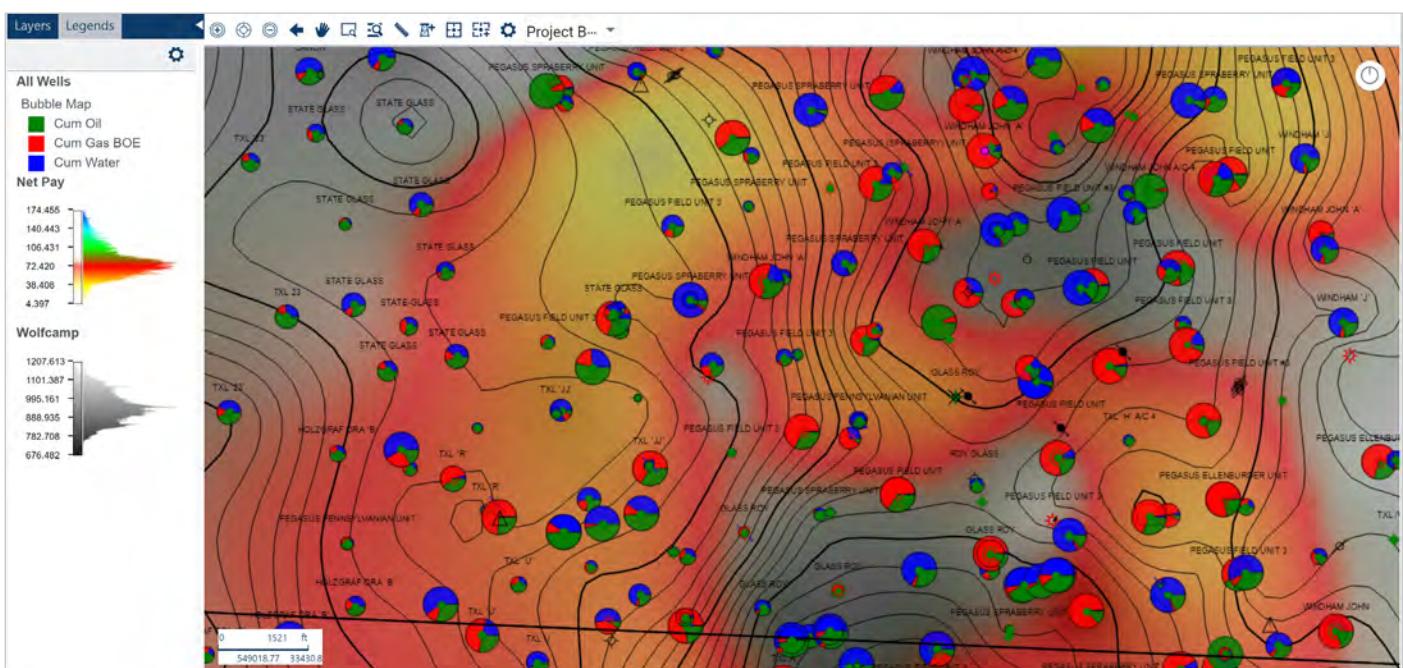
Mapping

- Intuitive mapping allows users to create complex structural and stratigraphic maps quickly.
- Quickly review mapping statistics prior to creating grids.
- Mapping supports a wide range of data types so you can analyze multiple trends across your fields.
- Stored grid parameters enable quick map updating to reflect latest interpretation data.
- Seamlessly update multiple structure and isochore grids with a single button click using Dynamic Map Update.
- Define framework rules in DMU to yield superior structural maps.
- Incorporate geophysical interpretations to more accurately model structures between wells.
- Easily update well subsets directly from the Basemap.
- Efficiently recreate maps or right-click transfer data types directly to a Spatial Explorer session.



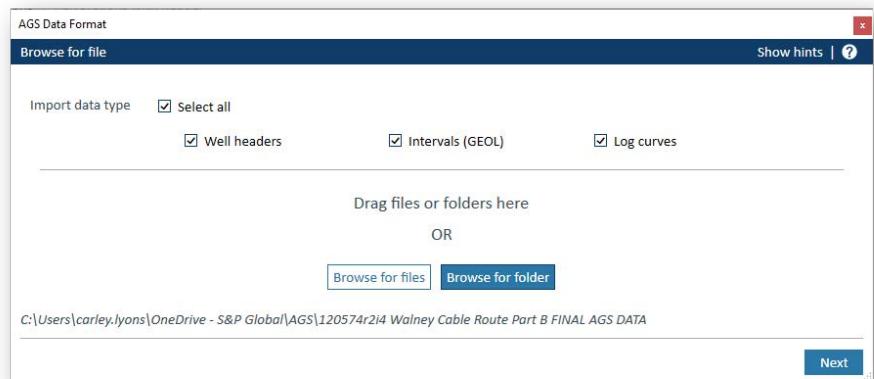
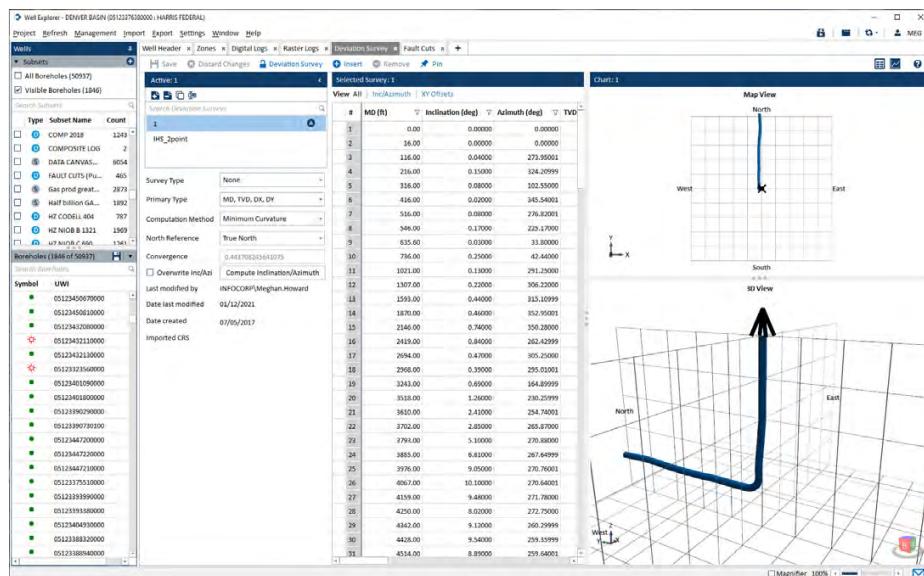
Enhanced Map Tool - Spatial Explorer

- Layer based map to combine Kingdom and proprietary GIS data into one single view.
- Comprehensive ESRI integration.
- Publish horizons, contours, and grids as Image Service in ArcGIS Portal.
- Advanced polygon workflows and calculations, thematic maps, buffers, and drainage radius.
- Limitless layer coblending.
- Enhanced options for data posting at well symbol or along the deviated borehole in attribute, bubble, and label display.
- Selective options for transferring data layer items to a Kingdom Culture or Polygon layer.
- Connect and import spatial layers directly from a Spatial Database Engine (SDE).



Data Management

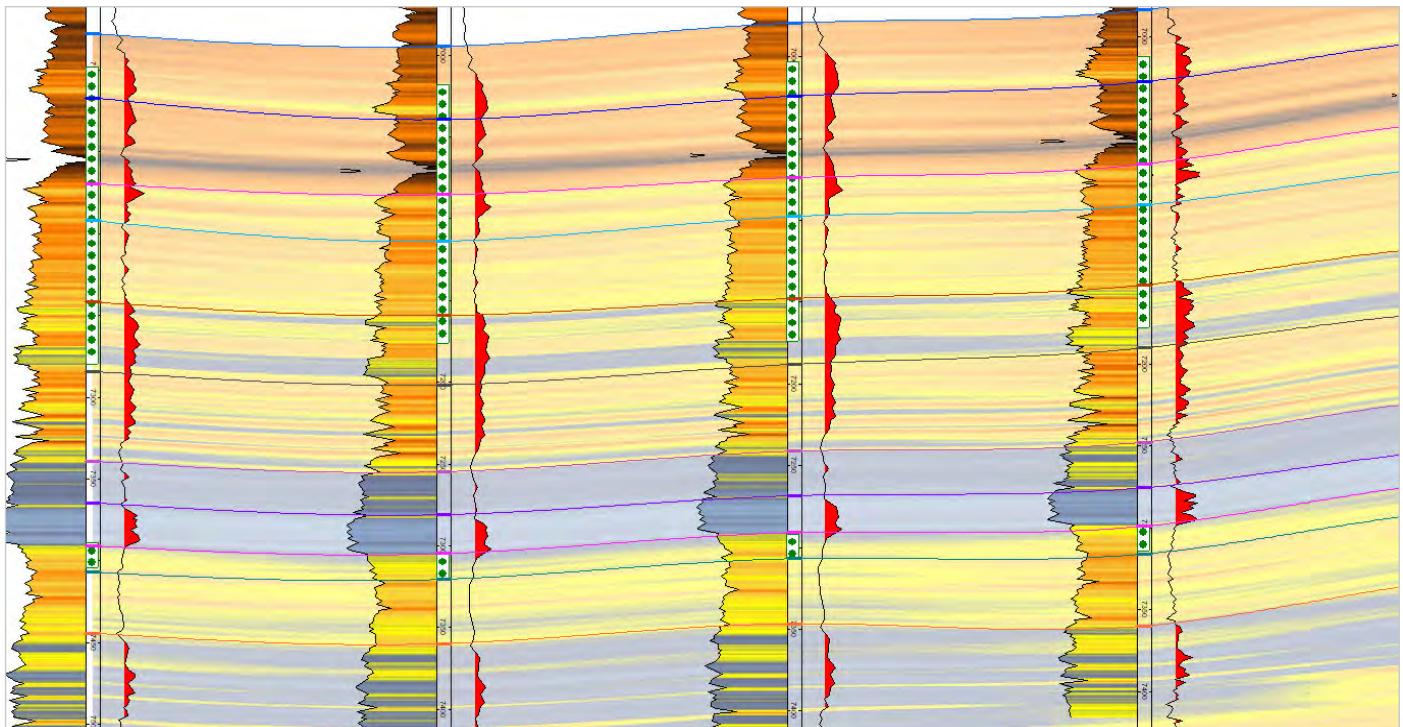
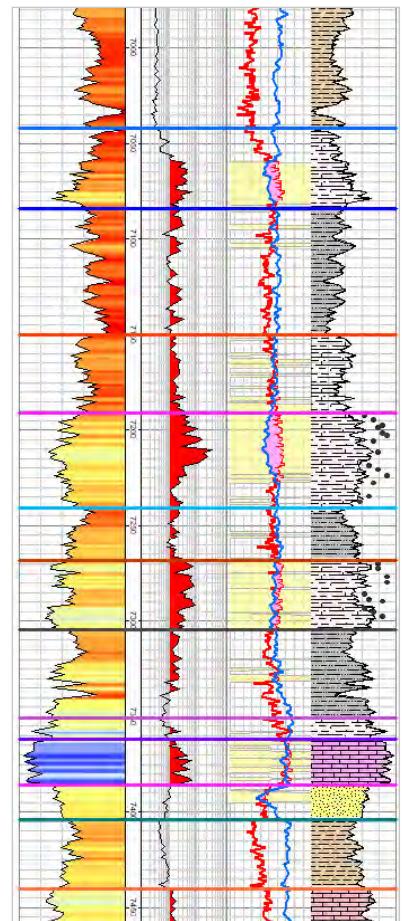
- Directly populate and update Kingdom projects with well, production, digital and raster log data using Direct Connect.
- Manage well data efficiently with the New Well Explorer.
- ASCII data loader and support for large volumes of raster log data by importing and storing calibrations in the project database.
- Leverage the power of Blue Marble coordinate conversion when loading data.
- Schedule our data loading jobs using Direct Connect.
- Share well and seismic data, grids, faults and horizons between Kingdom and Petrel* using the Kingdom Gateway Plug-in for the Petrel* platform.
- Share data with other applications through direct connections with EDM.
- Share data with other applications through connection with TIBCO Openspirit®.
- Manage multi-project environments on SQL Server, SQL Server Express or Oracle®.
- Transfer data between projects using Kingdom Data Transfer.
- Create well labels and lock data attributes in new management tools in Well Explorer.
- Import geotechnical and wind farm data with the new AGS file importer.



*Mark of Schlumberger

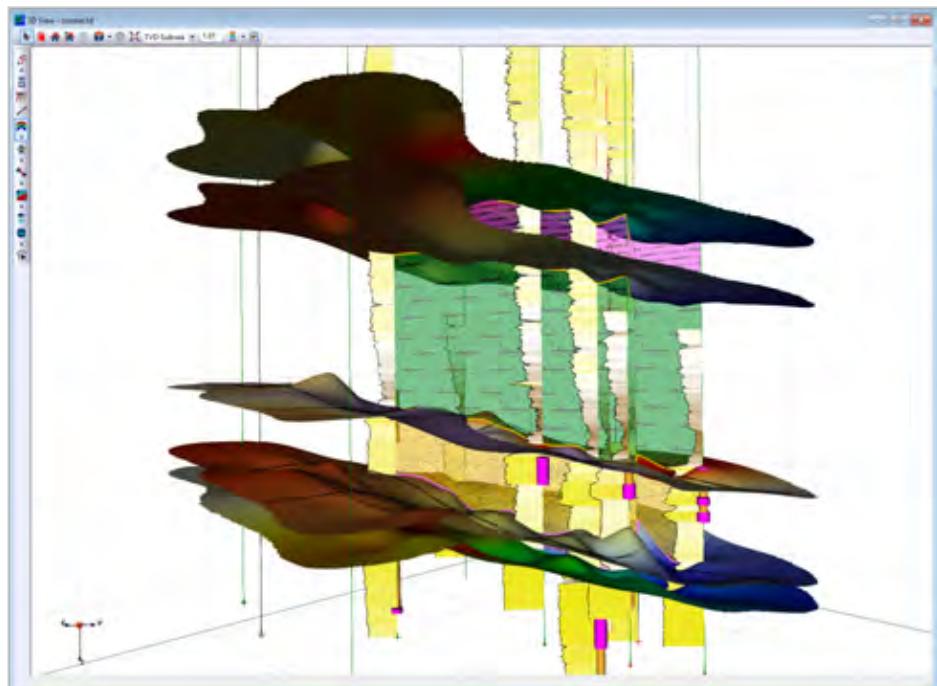
Petrophysics

- Utilize calculators and computations for digital logs to aide in regional interpretation and mapping efforts.
- Create composite logs to add interpretive lithology and comments in the cross-section.
- Leverage large volumes of raster log data with flexible utilities for calibration and interpretation.
- Machine Learning Raster Auto Digitization tool.
- Calculate and map reservoir properties such as water saturation, porosity, and permeability.
- Neural network-based Log Curve Predictor for the reconstruction of missing or corrupted log intervals.
- The following powered by Llyod's Register partnership with Interactive Petrophysics:
 - Log Analysis module for deterministic petrophysics.
 - Interactive curve editing to calculate trends, interactive bulk depth shift, curve splice, curve filter, and de-spike.
 - Multi-line formula calculator to create customized petrophysical models.
 - Share aliasing templates with Kingdom.



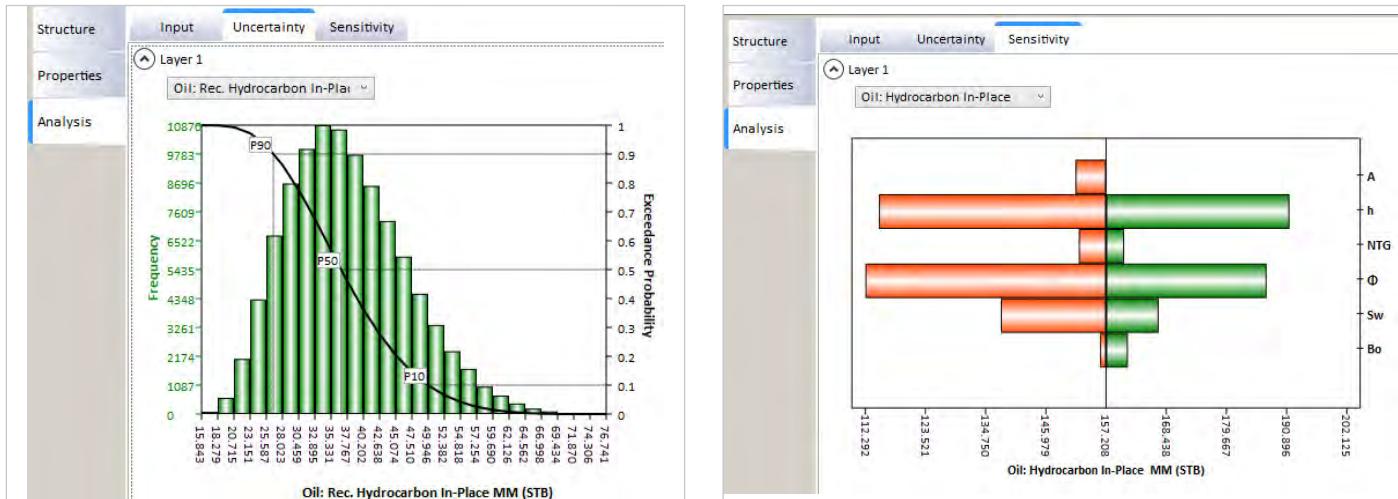
Cross Sections

- Generate structural and stratigraphic cross sections with one-click interactive correlation in cross section and 3D View.
- Share interpretations across the entire asset team with author priority and aliasing tools.
- Unravel stratigraphic complexities more efficiently with flexible flattening and fault surface modeling capabilities.
- Utilize very large well data sets including deviated and horizontal boreholes.
- Display borehole and well log information prominently on cross sections or correlation sections.
- Convert between different section types with a click of a button whether section is in depth or time, true distance, fixed distance or containing seismic attributes.
- Visualize map information in section with polygon and culture displays.
- Interpretive log shading and lithology fill between tops and unit fill modeling between grid profiles.
- Curve shading techniques including facies, cutoff, crossover, and cumulative Lithology shading.
- Display digital, raster and composite logs efficiently.
- Interval display provides the ability to post any well related information.
- Machine Learning Auto Top picking utility to aide with formation interpretation.
- Post data attributes above, below or at depth around the wellbore.



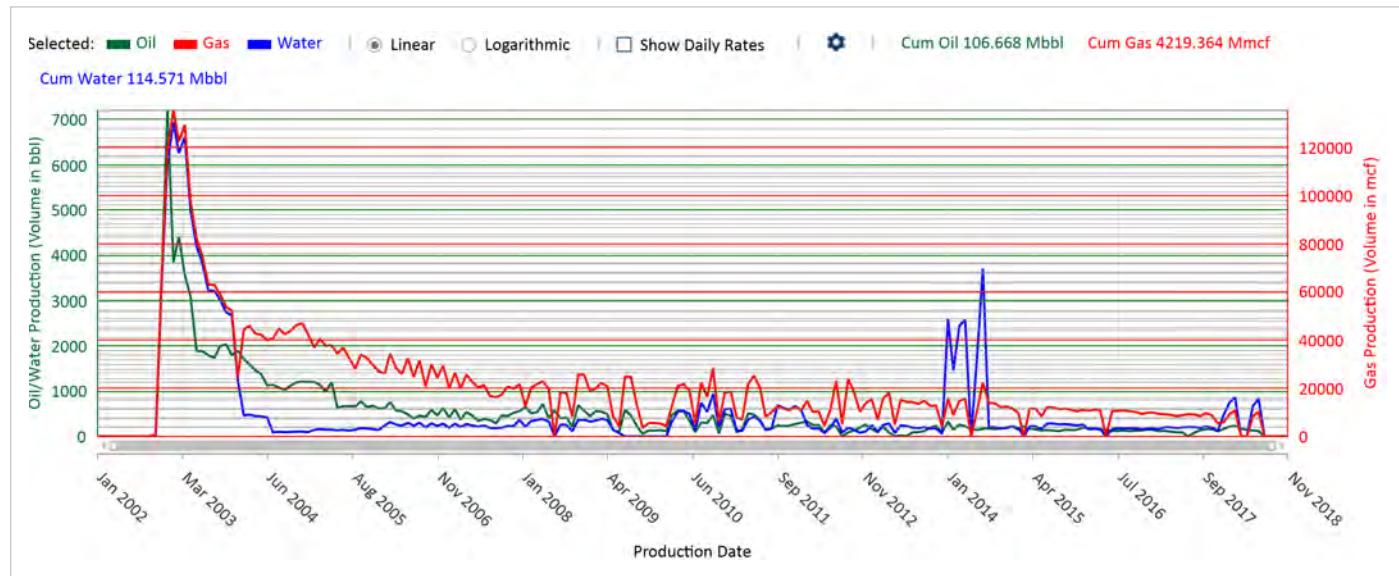
Volumetrics and Economics Reporting

- Multi-layer volumetrics allows evaluation of multiple reservoirs simultaneously.
- Use Monte Carlo simulation or Sensitivity analysis to understand trends.
- Perform sophisticated economic analysis linked to production forecasts.
- Links multiple economic scenarios to a single production forecast.



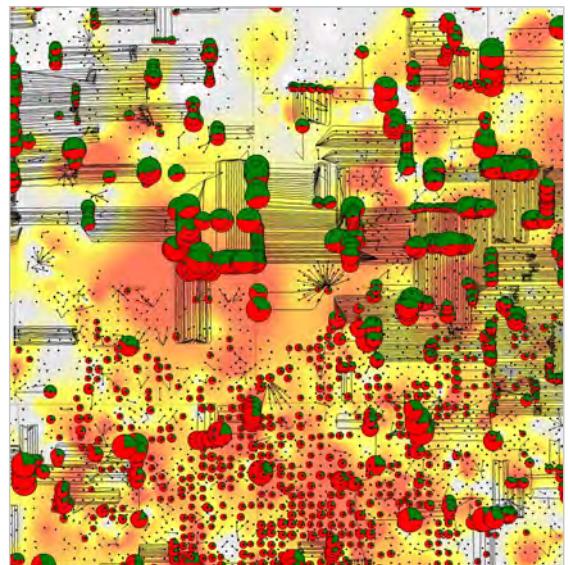
Decline Curve Analysis

- Common Decline Curve analysis through integration with Harmony Enterprise™ by Commodity Insights.
- Ability to decline all wells in a project with production data, single well, or subsets.
- Capture all decline parameters to zones and generate map.



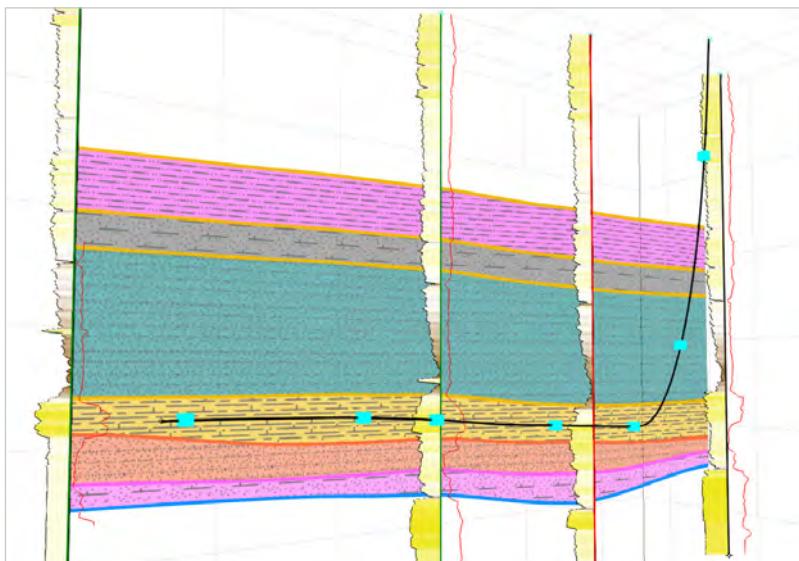
Production Analysis

- Efficiently map the overall productivity of your play with flexible tools for calculating cumulative and average production volumes.
- Produce presentation quality maps with attribute maps, bubble maps, and annotations.
- Multi-segment Decline Curve Analysis allows the incremental effect of a workover or recompletion to be analyzed.
- Forecasts can incorporate a combination of rate, volume and time limits.



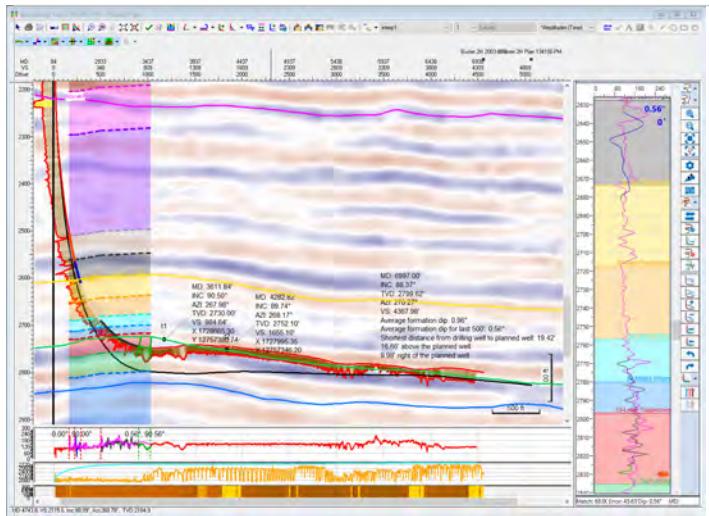
Well Planning

- Design wells through all phases of development.
- Design and modify well plans interactively in 3D view, map and cross section.
- Store plans so they can easily be updated as new interpretation insights are gained.
- Build well plans that honor your engineering constraints.
- Quickly generate prognosis reports and capture other information along a borehole.
- Perform well planning by quarter section and footage calls.



Geosteering

- Efficiently interpret drilling well to reference wells to optimize placement of the wellbore.
- Real-time data streaming accelerates geosteering interpretation workflows using WITSML.
- Accurately predict the geology and avoid hazards ahead of the bit.
- Subsurface and seismic models are automatically updated as new interpretations are made providing insights to steer the well powered by Dynamic Depth Conversion and Map Update.
- Integration allows importing of 3rd party geosteering cases.



Dynamic Map Update

- Dynamically build consistent surface models using your interpretation data.
- Easily incorporate geophysical and geological interpretations into a single consistent subsurface model.
- Define stratigraphic framework rules to produce consistent geologic models.
- Helps eliminate the need to perform multiple grid operations.
- Automatically builds structural and thickness maps when new data is interpreted or added.
- Accurately model facies and reservoir properties to better plan wells and position fracs with Dynamic Property Modeling.
- Display Dynamic Property Models in Maps, Section and 3D.
- Streamline the setup of your formation stratigraphic layers with new options in Dynamic Property Modeling.

Completion Optimization

- Provides access to data on completed wells and aids in understanding how to plan a new well's completion, enhancing integration and collaboration between asset team members.
- Acts as a Data Management Utility to store all your frac information to steer the well.

Learn more at spglobal.com/kingdom

About S&P Global Commodity Insights

At S&P Global Commodity Insights, our complete view of global energy and commodities markets enables our customers to make decisions with conviction and create long-term, sustainable value.

We're a trusted connector that brings together thought leaders, market participants, governments, and regulators to co-create solutions that lead to progress. Vital to navigating Energy Transition, S&P Global Commodity Insights' coverage includes oil and gas, power, chemicals, metals, agriculture, and shipping.

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