BLUE RIVER ANALYTICS: DECLINE CURVE (TERR MODEL)

Overview:

The Blue River Analytics Decline Curve Application (DCA) Template uses production rates from a Spotfire data table, and performs time normalization, outlier detection and removal, and decline curve fitting using hyperbolic, exponential, or combined decline models. The fitting process can be guided by engineers' knowledge of key decline parameters, improving results in areas of poor or limited production data. Along with estimates of best fit decline parameters for all marked wells, an aggregated 'type curve' is computed by combining decline parameters across wells. EUR's are also calculated, along with forecast life of the well up to its economic limit, and the RMS error between the best fit model and the actual production data.

Additionally, The DCA Template complements the functionality of other, third-party decline curve analysis products like PHDWin and Aries. Unlike these detailed-analysis products, DCA is designed to provide accurate decline curve fitting and EUR estimates for *hundreds of wells, in seconds, with virtually no required inputs from the user*. When coupled with the visualization, marking, and drill-down capability in Tibco Spotfire, geoscientists as well as engineers can quickly mark wells on a map, filter those wells to a specific producing zone, and seconds later, be looking at EUR distributions and any trends and patterns relating to completion techniques, operators, or map location. Visualizations that show how decline rates and IP's are distributed across marked wells can be drilled down to show individual wells and decline patterns. Statistical aggregation of the fitting results generate a type-curve with upper and lower confidence limits. Most powerful, is the fact that available visualizations and dashboards are virtually endless, limited only by the imaginations of professional staff and management and the enormous power of Spotfire.

Key benefits:

- Estimate best fit decline rates, IP's and other decline parameters in real time, across a user-defined group of wells using a variety of fitting models from simple exponential decline, to hyperbolic-exponential hybrids for modeling unconventional production.

- Complements the functionality of other, third-party decline curve analysis products like PHDWin and Aries

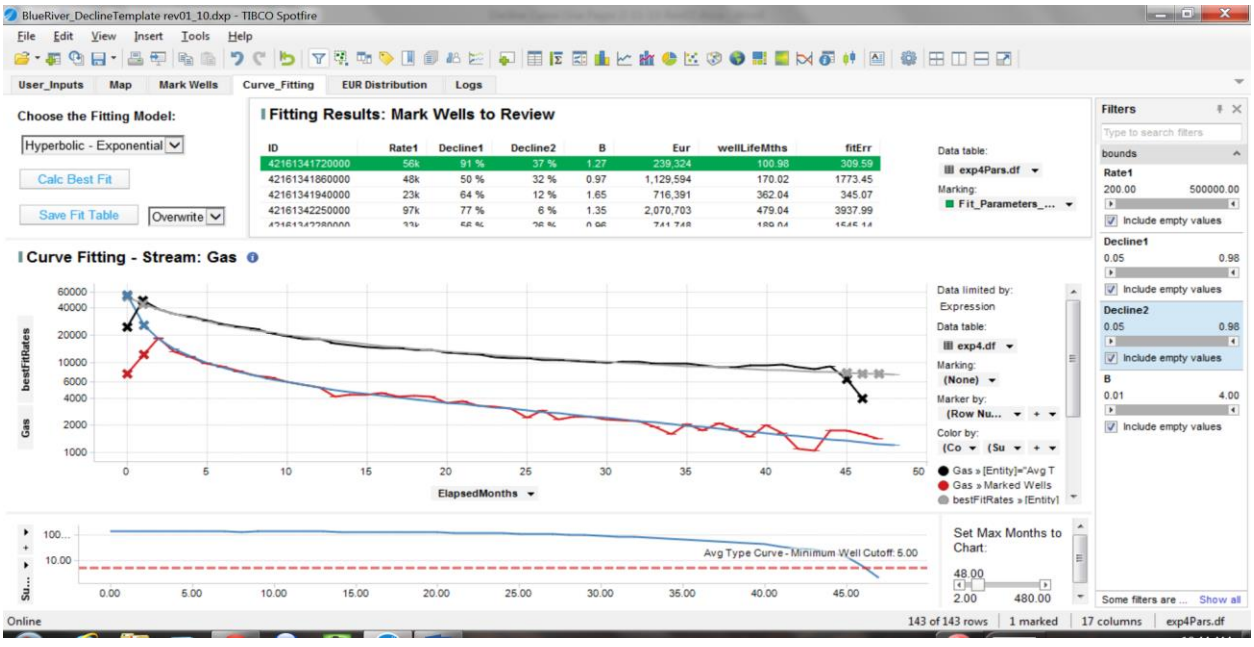
- Calculates EUR's for economic analysis, reservoir characterization, and discovery of relationships between areas of low and high recovery with other parameters such as completion technique, operator, zone, etc.

- Calculates a type-curve aggregation across all marked wells, giving engineers a reference decline curve against which other wells (e.g. with limited or poor data, in different areas of the field) can be compared.

- Fitting parameters and EUR's for all wells can be saved to an Excel / text file with a single button click, making them available for use in other client applications.

- Data requirements are simple and easily configured, requiring simply 4 columns: Unique well identifier, Date, Oil, and Gas monthly production rate measurements. Other well header information is optional, and can be included as per client requirements to enhance visualization and data discovery around fitting results.

Screen Shot of Blue River Decline Curve Template:



This screen shot shows fitting results for 143 wells in the Arkoma Basin, using hyperbolic to exponential fitting model. Aggregated type curve with best fit (black and grey lines respectively) are shown with individual well fit. Best fit parameters for the marked (displayed) well along with any other well can be reviewed in the table visualization at top.

About Blue River Analytics:

Blue River Analytics makes our customers smarter. Utilizing deep expertise in the energy industry and TIBCO Spotfire, we create easy-to-use applications for visual and predictive analytics, enabling our customers to make faster, smarter decisions.

Contact:

Blue River Analytics

info@blueriveranalytics.com

(720) 295-7242