



# Permedia Petroleum Systems Well Toolkit

## Introducing Well Toolkit

Permedia is pleased to announce the immediate availability of the first beta release of its Petroleum Systems Well Toolkit.

Well Toolkit features a redesigned Well Viewer, and includes the Delta Log R (DlogR) calculator for determining total organic carbon (TOC), as well as a scripting environment for user-defined calculators and extensions.

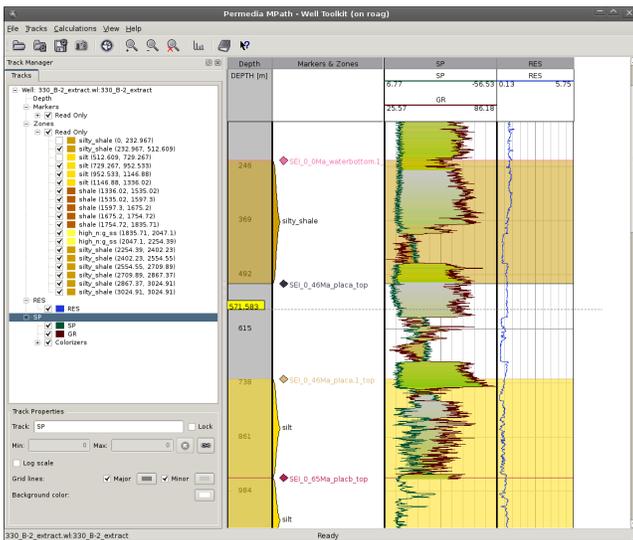
## New Well Viewer

MPath's Well Viewer has been completely redesigned to support all major well formats, drag and drop assignment of traces into tracks, interaction with other viewers, zones and markers, and more.

## See your data in context

Well Viewer now features enhanced support for a variety of data. Drag and drop any map into Well Viewer to display markers at the intersection point with the well. Drop in a seismic volume to extract values along the well path. Drop in any basin modeling mesh to extract mesh zones and properties. Drop in curves or tables to see calibration or geochemistry data plotted as traces alongside your well data.

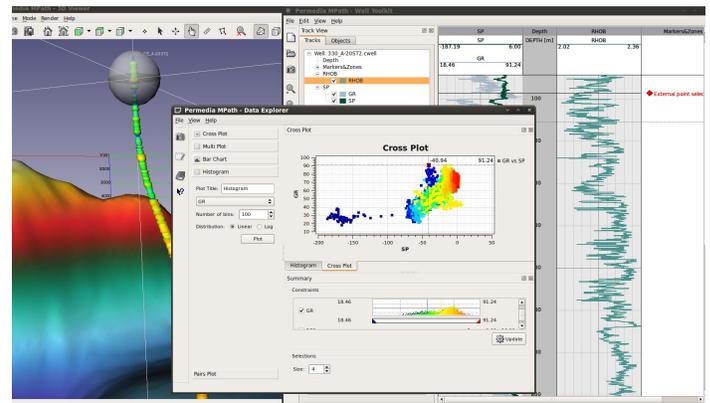
The new Well Viewer also leverages MPath's extensive data support – load data from basin modeling packages including MPath, PetroMod, Temis and Trinity; all major map and well formats; and reservoir data via Gocad objects, and Eclipse, RMS and VIP grids.



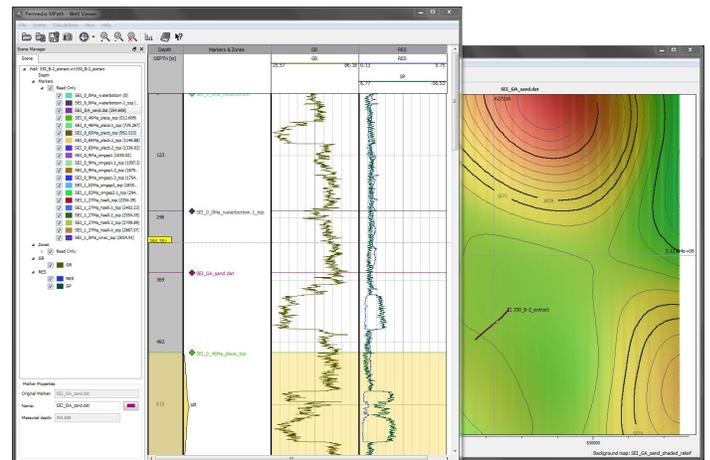
Drag and drop traces and data objects onto tracks.  
Interactive marker/zone creation.

## Fully interactive

Launch the new Data Explorer from Well Viewer to create cross plots and summary statistics for the extracted well data. Select points in the cross plot to highlight the data as a marker in Well Viewer. Well Viewer now features complete synchronization between Data Explorer, Well Viewer and 3D Viewer – open 3D Viewer with your volume, mesh, map and well data and select points to create markers in 3D Viewer.



All Viewers are synchronised



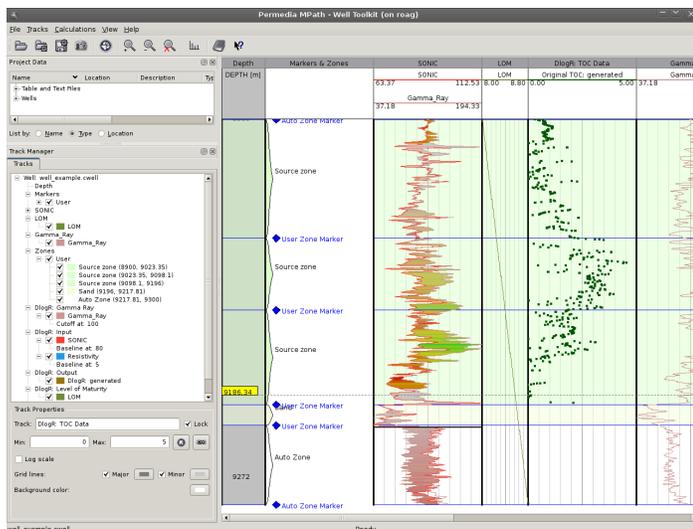
Deviated well paths displayed in map viewer. Dragging and dropping a map onto Well Viewer creates markers at map-well intersection.

## Powerful calculators

Well Toolkit is more than just another well viewer – it provides an environment where you can interact with basin data to perform well-focused petroleum systems calculations. Well Toolkit includes two calculators: the **DlogR** calculator for determining TOC and Newcastle **ShaleQuant**<sup>1</sup>, which uses neural networks for deriving shale properties as well as TOC.

### Delta log R

The DlogR calculator is an interactive tool based on Passey, Q. R., et al. (*A Practical Model For Organic Richness From Porosity and Resistivity Logs*, AAPG Bull., Dec. 1990). DlogR calculates present-day TOC from a new variable – dlogr – and a level of maturity (LOM). The *dlogr* variable is calculated from an equation that includes sonic, resistivity and their respective baselines.



D-log-R implemented as a WellToolkit extension

As both sonic and resistivity tend to drift with depth, the baselines need to be re-adjusted at periodic intervals in the well. Using Well Viewer and DlogR, you can adjust the baselines and immediately see their impact on the results. By adding horizontal breaks throughout the well, you can perform independent baseline adjustment for different regions of the well. Additionally, DlogR uses an interactive gamma ray cutoff to limit the calculations to regions of interest.

### ShaleQuant

ShaleQuant is an interactive tool based on Yunlai Yang, Andrew C. Aplin and Steve R. Larter (*Quantitative assessment of mudstone lithology using geophysical wireline logs and artificial neural networks*, Petroleum Geoscience, 2004). ShaleQuant calculates grain density, clay content and present-day TOC from different wireline log data within a well.

<sup>1</sup> Requires ShaleQuant license, available from Permedia or Andy Aplin at Newcastle University.

## Unlimited flexibility

Both DlogR and ShaleQuant use links in Well Viewer for taking one or more traces and deriving new traces based on user interactions and defined calculations. Using the new equation and scripting support in Well Viewer, you can create any number of traces on the fly based on existing traces, or other data added to the scene.

### Scripting

For more complicated equations or to use external data, lookup tables or other types of data, Well Viewer's new scripting support lets you easily add custom calculators, without the need for any additional tools. The scripting engine is based on Qt Script, a derived form of the Javascript programming language. (Going forward, this scripting environment will be used throughout MPath, including the Reaction Plugin Interface.)

The following simple example script implements the Gardner equation for calculating density from sonic slowness:

```
{
  name: "Gardner Equation",
  main: function(DTCO)
  {
    return 0.23*Math.pow((1000000/DTCO), 0.25);
  }
}
```

Scripts can be encrypted to protect your intellectual property.

## Available now

All Permedia sponsors have immediate access to the the new Well Viewer. Well Toolkit sponsors have access to DlogR and the scripting extensions.

Both the new Well Viewer and Well Toolkit extensions are available for testing today in the latest development build (aka, "nightly"). Like all Permedia software, it is available on Windows and Linux (both 32 and 64-bit).

## For more information

For more information on MPath and Well Toolkit extensions, contact us at:

The Permedia Research Group Inc.

+1 613 230-6209

www.permedia.ca

info@permedia.ca