GOMFields Help

GOMFields

US Federal Offshore Gulf of Mexico Oil and Gas Field Production Analysis Software

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by Petroleum Solutions Ltd

GOMFields Help

Printed: May 2010

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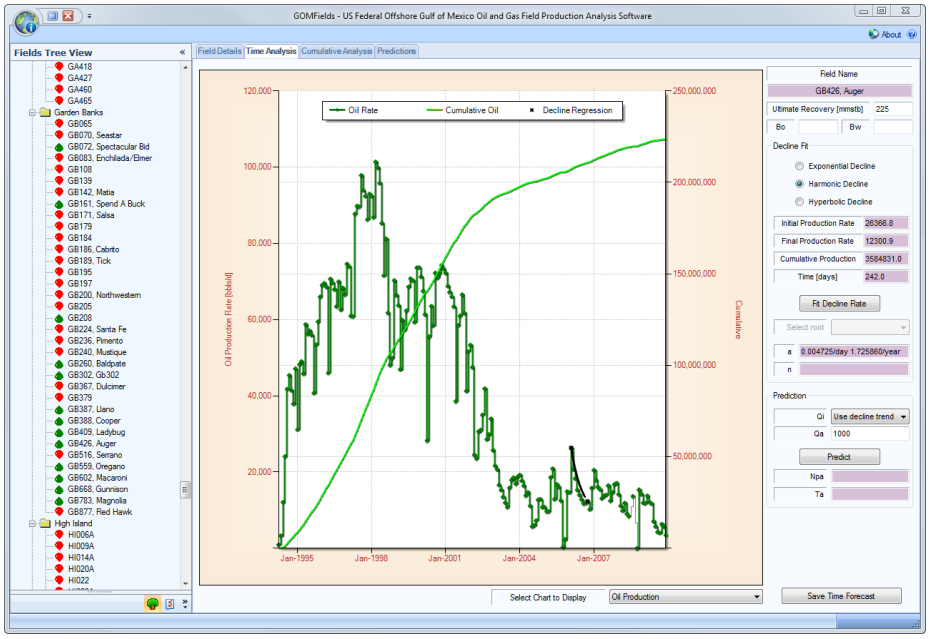
Mexico Oil and Gas Field
Production Analysis Software

Part I

1 Welcome to GOMFields

1.1 Introduction



GOMFields is a production analysis database containing all the US Federal Offshore Gulf of Mexico oil and gas producing fields monthly production data to December 2009. The intent of this application is to periodically re-publish the database once the data becomes available.

Through the use of this application, the user can quickly :

- Analyse the production history of any field in the Gulf of Mexico, based on a rate or ratio v's time basis or rate or ratio v's cumulative basis, for all available data to December 2009.
- Export the field production histories of any field to any external package via copy and paste and the windows clipboard.
- Display presentation quality charts of field production histories, and export any of the charts within the application via the clipboard or by saving as JPG / PNG / etc.
- Obtain well statistics [maximum rates, cumulative recoveries, etc] on a field-by-field basis, for all available data from January 1996 to December 2009.
- Perform field level decline curve analysis on the oil or gas rate v's time basis, or any rates and ratios displayed on a cumulative basis.

- Examine the key production profile statistics for any UK oil and gas field for analogue field comparison. Figures are calculated for peak offtake rate, cumulative offtake, decline curve parameters, associated hydrocarbon (gas or condensate) and non-hydrocarbon (water) development with time and versus cumulative hydrocarbon phase.

- Contrast the production performance for similar fields to enable field acquisition analysis, and future potential production and reserves optimisation.

License.dat File

The "License.dat" file is located in the Application Startup folder (eg C:\Program Files\Petroleum Solutions\GOMFields\)

The contents of this ASCII license file needs to contain the following license information.

[License Settings]
LicensedTO =
Company =
ProductID =
LicenseID =

If any of the above License key information is incorrect or absent, or if the License.dat file is missing then the application will fail to startup.

.NET Framework

This application requires the presence or installation of Microsoft .Net Framework version 2.

.NET Framework version 2 is a component of the Microsoft Windows® operating system used to build and run Windows-based applications.

Should .NET Framework version 2 not be installed on the destination PC then a link is provided below to download this system software. The user should download and install .NET Framework version 2 before attempting to install this application.

http://www.petroleumsolutions.co.uk/downloads.html

The installation of .Net Framework also requires a minimum software and hardware requirement. Details of which are shown below. Specifically, note that you cannot install the .NET Framework on a computer running the Microsoft Windows 95 operating system.

Minimum requirements

To install .NET Framework [Dotnetfx2.exe], you must have one of the following operating systems, with Microsoft Internet Explorer 5.01 or later installed on your computer:

- Microsoft® Windows® 98

- Microsoft® Windows® 98 Second Edition
- Microsoft® Windows® Millennium Edition (Windows Me)
- Microsoft® Windows NT® 4 (Workstation or Server) with Service Pack 6a
- Microsoft® Windows® 2000 (Professional, Server, or Advanced Server) with the latest Windows service pack and critical updates available from the Microsoft Security Web site (www.microsoft.com/security).
- Microsoft® Windows® XP (Home or Professional)

Recommended hardware

CPU Recommended	RAM Recommended
Pentium 90 MHz or faster	96 MB or higher

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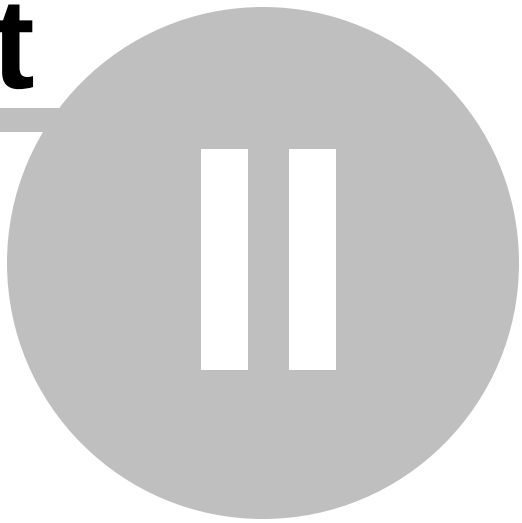
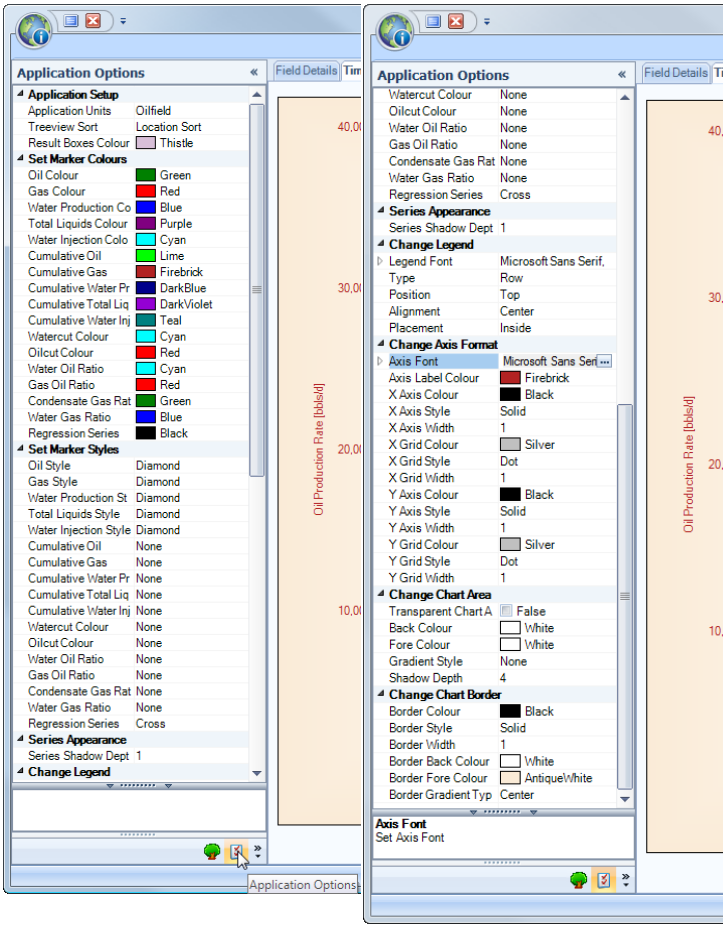


2 Application Options

2.1 Chart Display Options

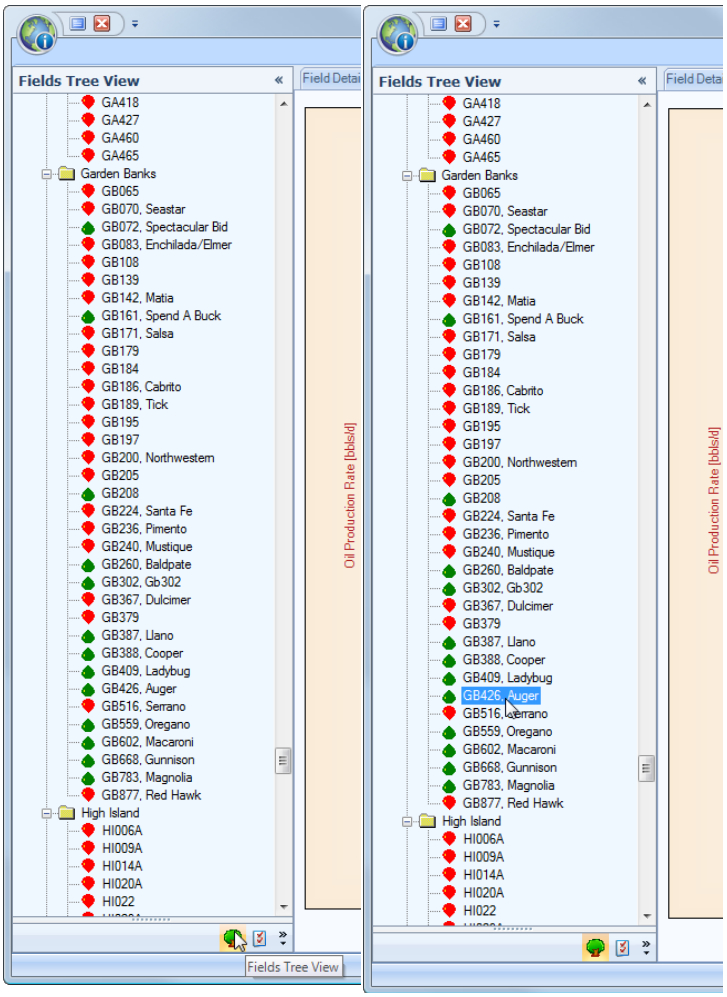
Any part of the chart displays can be changed to suit specific user preferences. These options can be accessed by selecting the Application Options button on the bottom left corner of the application, as highlighted below.

By scrolling up and down within this Application Options property grid and selecting the various options, the user can change any part of the Chart Appearance.

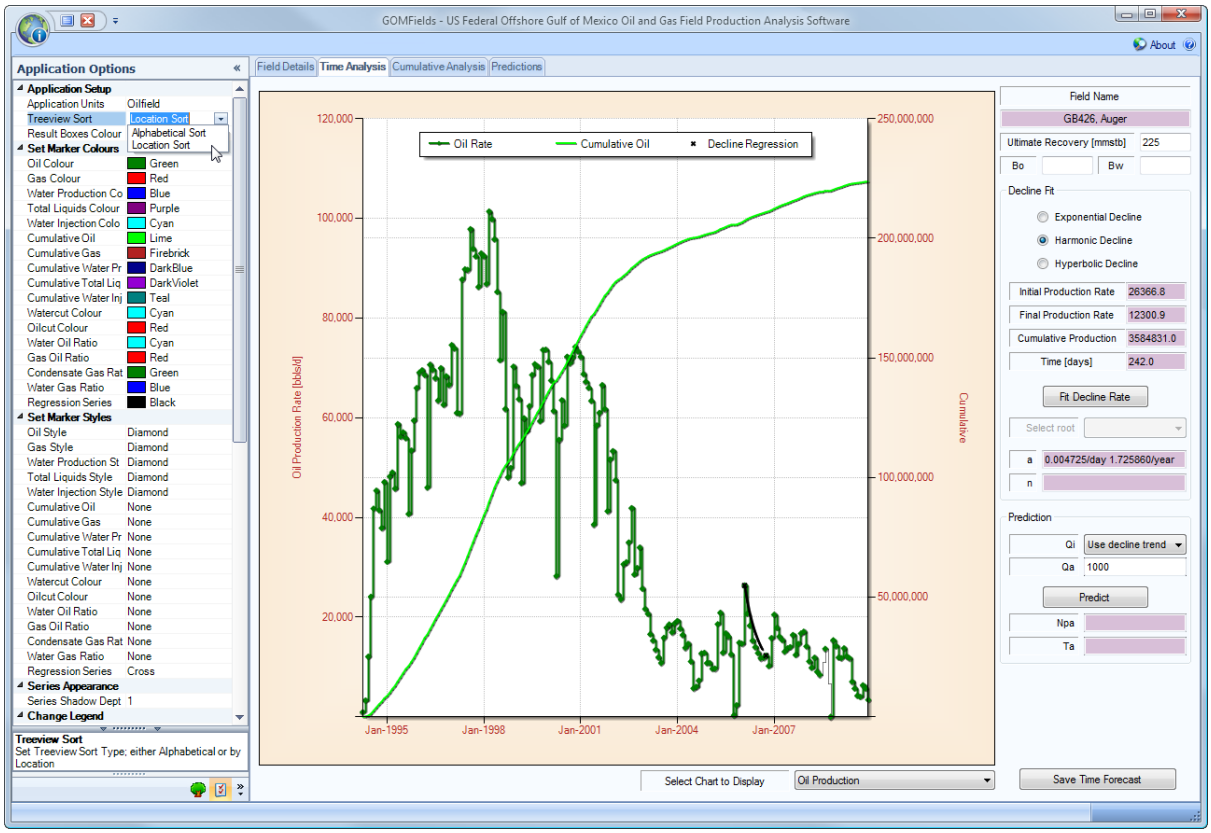


2.2 Treeview Navigation

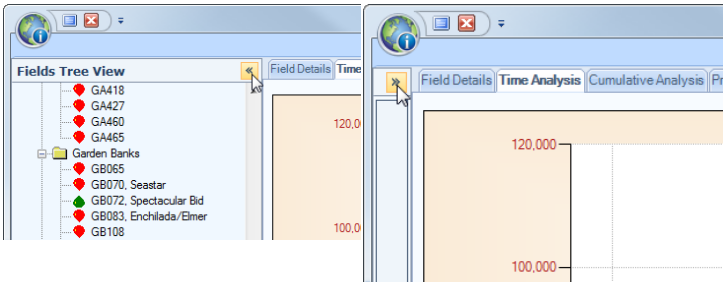
Selecting an oil or gas field for analysis could not be easier, and is done with the Fields Tree View panel. To select a field simply single right mouse click on the field name within the Field View panel, as shown below.



The user can choose to sort the FieldView docking panel, either alphabetically or by Gulf of Mexico Planning Area. The selection between these two options is also highlighted below.



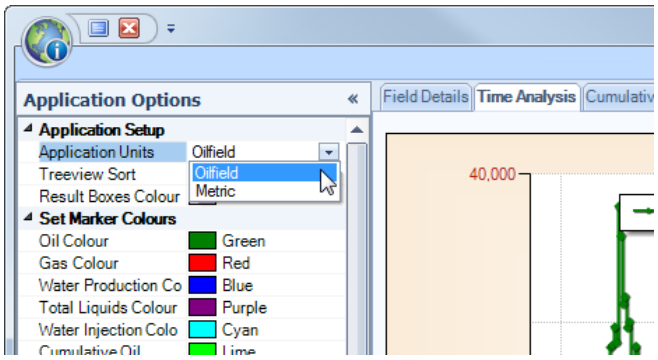
The user can also choose to auto Hide the Panel by selecting the Arrows icon, as shown below. Once selected the Panel should collapse, as shown below. To recover the Fields Tree View Panel just select the Arrows icon again.



2.3 Units

The database application units are stored in metric units, however within the application the user can choose to work in either Metric or, more commonly, Oilfield units.

To switch between units, simply select the Oilfield Units or Metric Units menu item as shown below.



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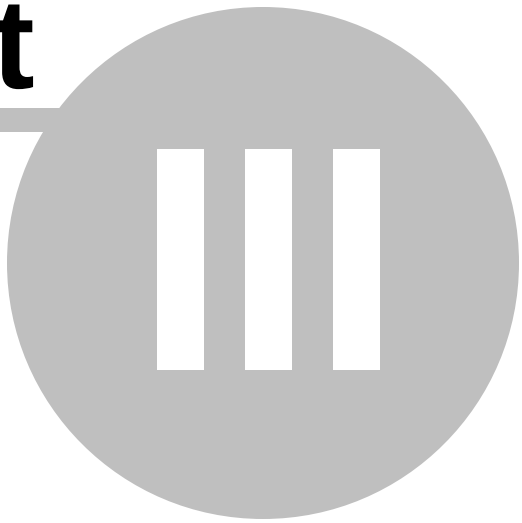
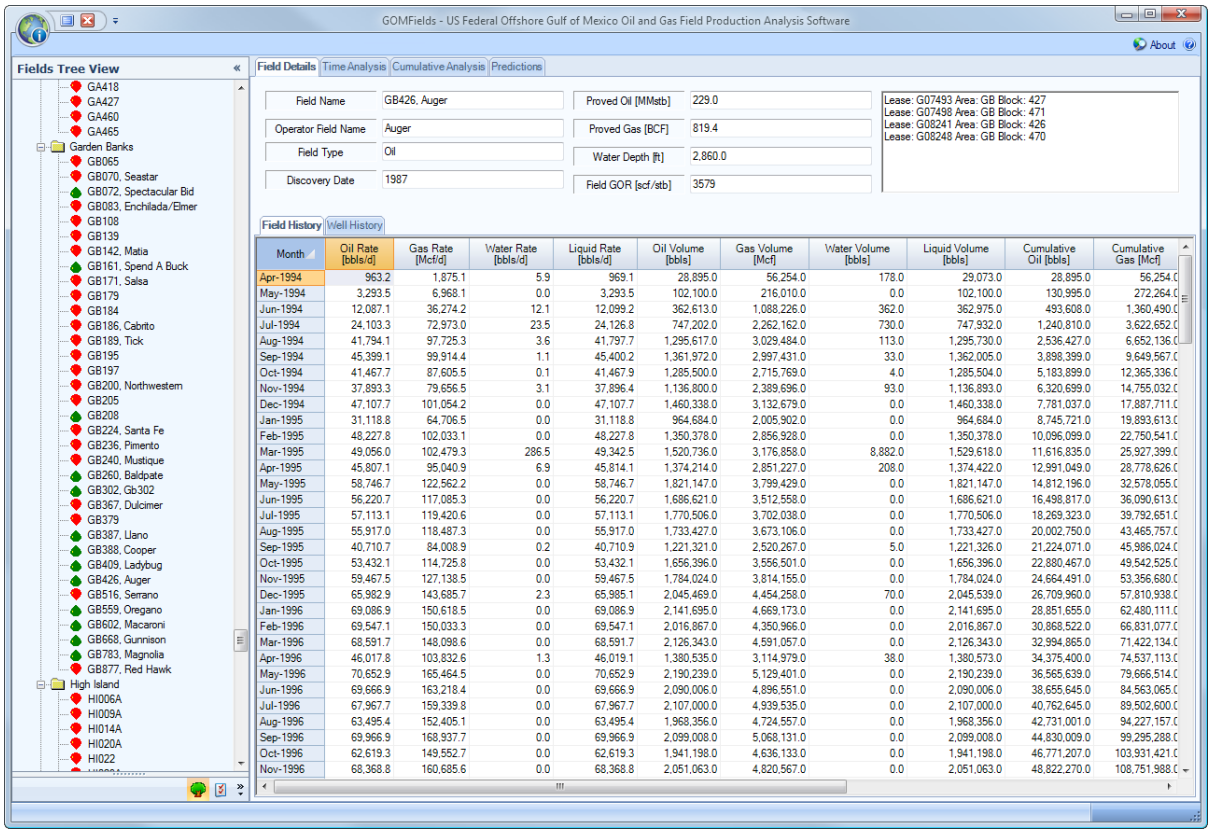


3 Field Details

3.1 Overview and Field History Data

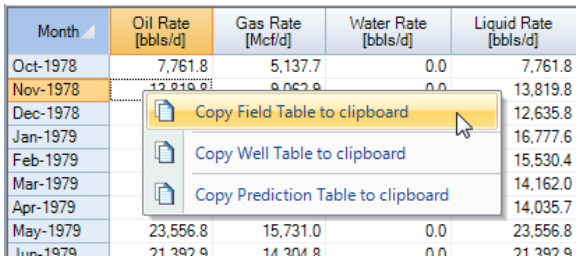
Once the application launches successfully, the following should be displayed.



Copy and Paste Datatable Information to External Applications

Any of the table data can be copied as pasted into external applications via two methods.

1. Either press the right mouse button once over any of the tables to activate the table context menu, as highlighted below, then select the various menu item to copy a specific table to the clipboard.

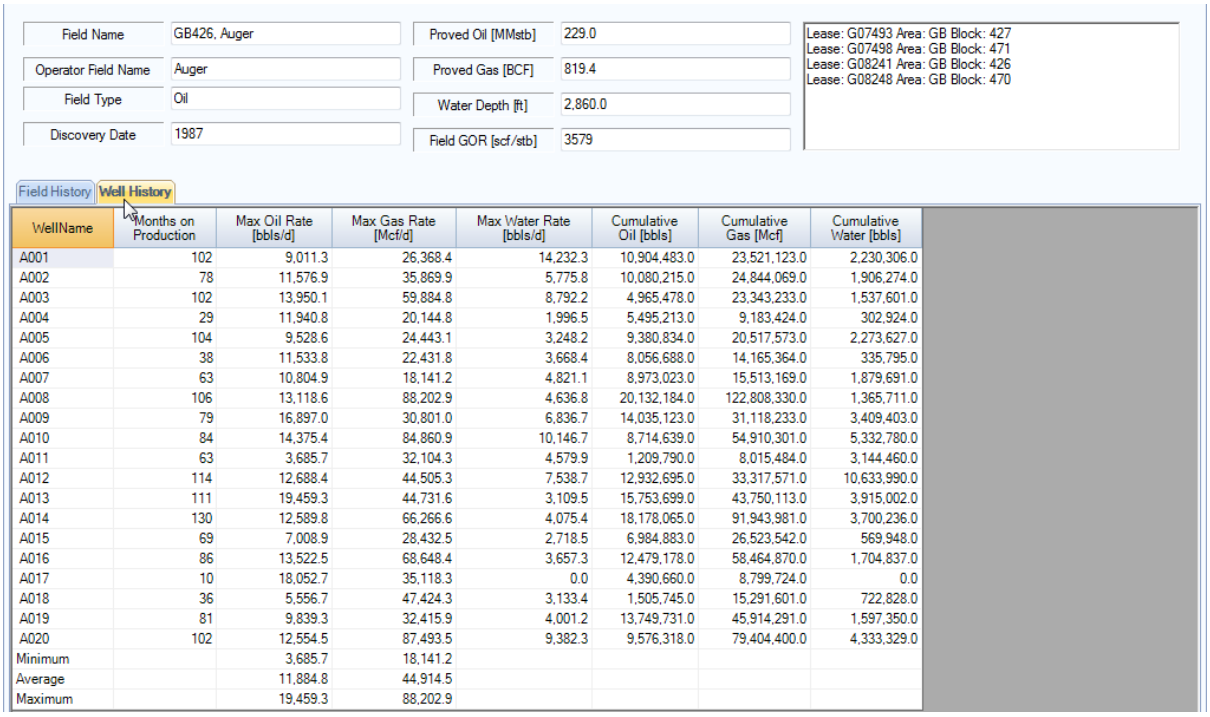


2. Or, simply select and drag an area with the mouse, then press the standard windows CTRL+C keys to copy the selected area to the clipboard.

Month	Oil Rate [bbls/d]	Gas Rate [Mcf/d]	Water Rate [bbls/d]	Liquid Rate [bbls/d]
Oct-1978	7,761.8	5,137.7	0.0	7,761.8
Nov-1978	13,819.8	9,062.9	0.0	13,819.8
Dec-1978	12,635.8	8,108.7	0.0	12,635.8
Jan-1979	16,777.6	11,338.3	0.0	16,777.6
Feb-1979	15,530.4	10,323.2	0.0	15,530.4
Mar-1979	14,162.0	9,254.7	0.0	14,162.0
Apr-1979	14,035.7	9,054.7	0.0	14,035.7
May-1979	23,556.8	15,731.0	0.0	23,556.8
Jun-1979	21,392.9	14,304.8	0.0	21,392.9
Jul-1979	17,887.8	11,887.4	0.0	17,887.8
Aug-1979	20,433.0	13,089.2	0.0	20,433.0
Sep-1979	18,391.8	11,496.1	0.0	18,391.8
Oct-1979	15,646.8	9,356.1	0.0	15,646.8
Nov-1979	13,801.5	8,824.0	0.0	13,801.5
Dec-1979	13,385.5	8,412.9	0.0	13,385.5
Jan-1980	14,338.7	8,631.6	0.0	14,338.7
Feb-1980	13,525.0	7,350.3	0.0	13,525.0

3.2 Well History Data

Summary well data has also been incorporated into the database. Based on published well data from January 1996 to December 2009, individual wells have been summarised in the database and presented by field in the formats presented below. From this data, the user can approximately determine the range of peak production rates and likely well cumulative production volumes for any field with data to December 2009.



Field Name	GB426, Auger	Proved Oil [MMstb]	229.0	Lease: G07493 Area: GB Block: 427 Lease: G07498 Area: GB Block: 471 Lease: G08241 Area: GB Block: 426 Lease: G08248 Area: GB Block: 470
Operator Field Name	Auger	Proved Gas [BCF]	819.4	
Field Type	Oil	Water Depth [ft]	2,860.0	
Discovery Date	1987	Field GOR [scf/stb]	3579	

Field History | Well History

WellName	Months on Production	Max Oil Rate [bbls/d]	Max Gas Rate [Mcf/d]	Max Water Rate [bbls/d]	Cumulative Oil [bbls]	Cumulative Gas [Mcf]	Cumulative Water [bbls]
A001	102	9,011.3	26,368.4	14,232.3	10,904,483.0	23,521,123.0	2,230,306.0
A002	78	11,576.9	35,869.9	5,775.8	10,080,215.0	24,844,069.0	1,906,274.0
A003	102	13,950.1	59,884.8	8,792.2	4,965,478.0	23,343,233.0	1,537,601.0
A004	29	11,940.8	20,144.8	1,996.5	5,495,213.0	9,183,424.0	302,924.0
A005	104	9,528.6	24,443.1	3,248.2	9,380,834.0	20,517,573.0	2,273,627.0
A006	38	11,533.8	22,431.8	3,668.4	8,056,688.0	14,165,364.0	335,795.0
A007	63	10,804.9	18,141.2	4,821.1	8,973,023.0	15,513,169.0	1,879,691.0
A008	106	13,118.6	88,202.9	4,636.8	20,132,184.0	122,808,330.0	1,365,711.0
A009	79	16,897.0	30,801.0	6,836.7	14,035,123.0	31,118,233.0	3,409,403.0
A010	84	14,375.4	84,860.9	10,146.7	8,714,639.0	54,910,301.0	5,332,780.0
A011	63	3,685.7	32,104.3	4,579.9	1,209,790.0	8,015,484.0	3,144,460.0
A012	114	12,688.4	44,505.3	7,538.7	12,932,695.0	33,317,571.0	10,633,990.0
A013	111	19,459.3	44,731.6	3,109.5	15,753,699.0	43,750,113.0	3,915,002.0
A014	130	12,589.8	66,266.6	4,075.4	18,178,065.0	91,943,981.0	3,700,236.0
A015	69	7,008.9	28,432.5	2,718.5	6,984,883.0	26,523,542.0	569,948.0
A016	86	13,522.5	68,648.4	3,657.3	12,479,178.0	58,464,870.0	1,704,837.0
A017	10	18,052.7	35,118.3	0.0	4,390,660.0	8,799,724.0	0.0
A018	36	5,556.7	47,424.3	3,133.4	1,505,745.0	15,291,601.0	722,828.0
A019	81	9,839.3	32,415.9	4,001.2	13,749,731.0	45,914,291.0	1,597,350.0
A020	102	12,554.5	87,493.5	9,382.3	9,576,318.0	79,404,400.0	4,333,329.0
Minimum		3,685.7	18,141.2				
Average		11,884.8	44,914.5				
Maximum		19,459.3	88,202.9				

Again, the user can copy and paste the datatable information to any external package via the two methods discussed in the previous section.

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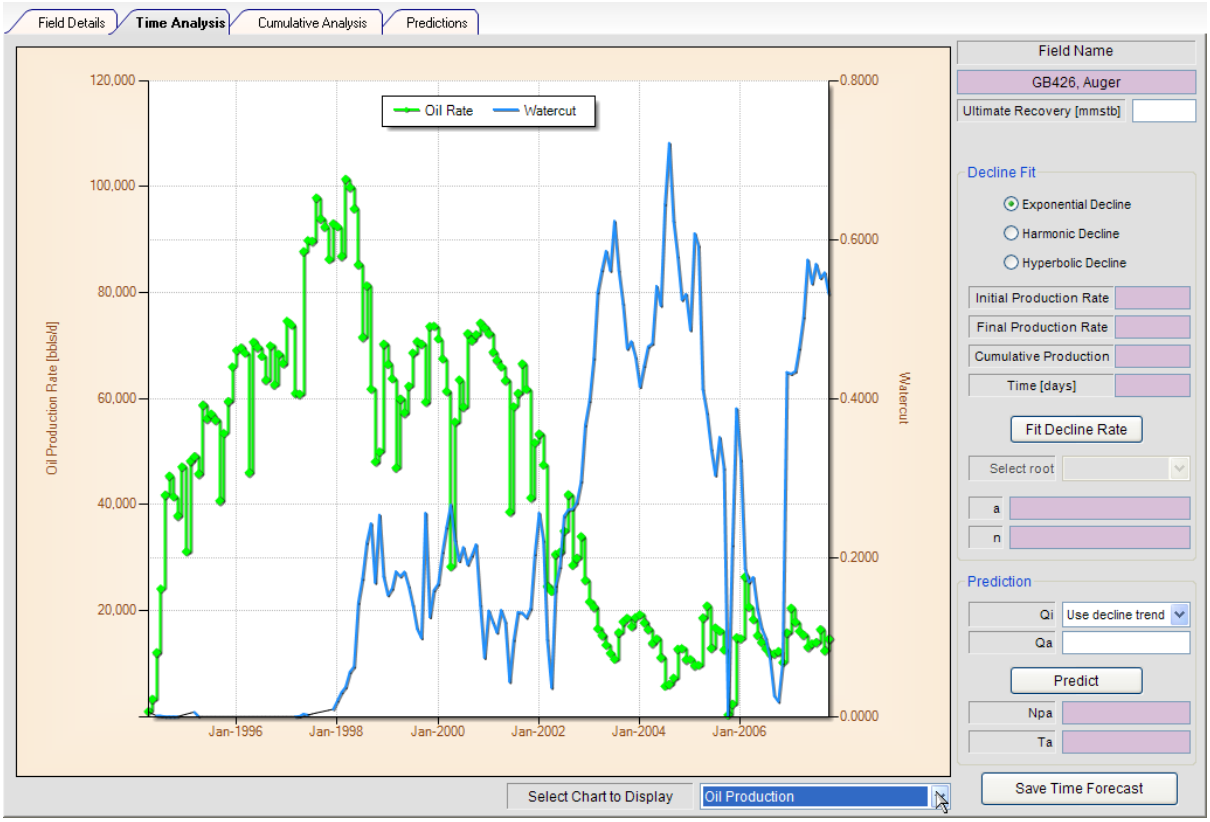
Part IV

4 Time Analysis

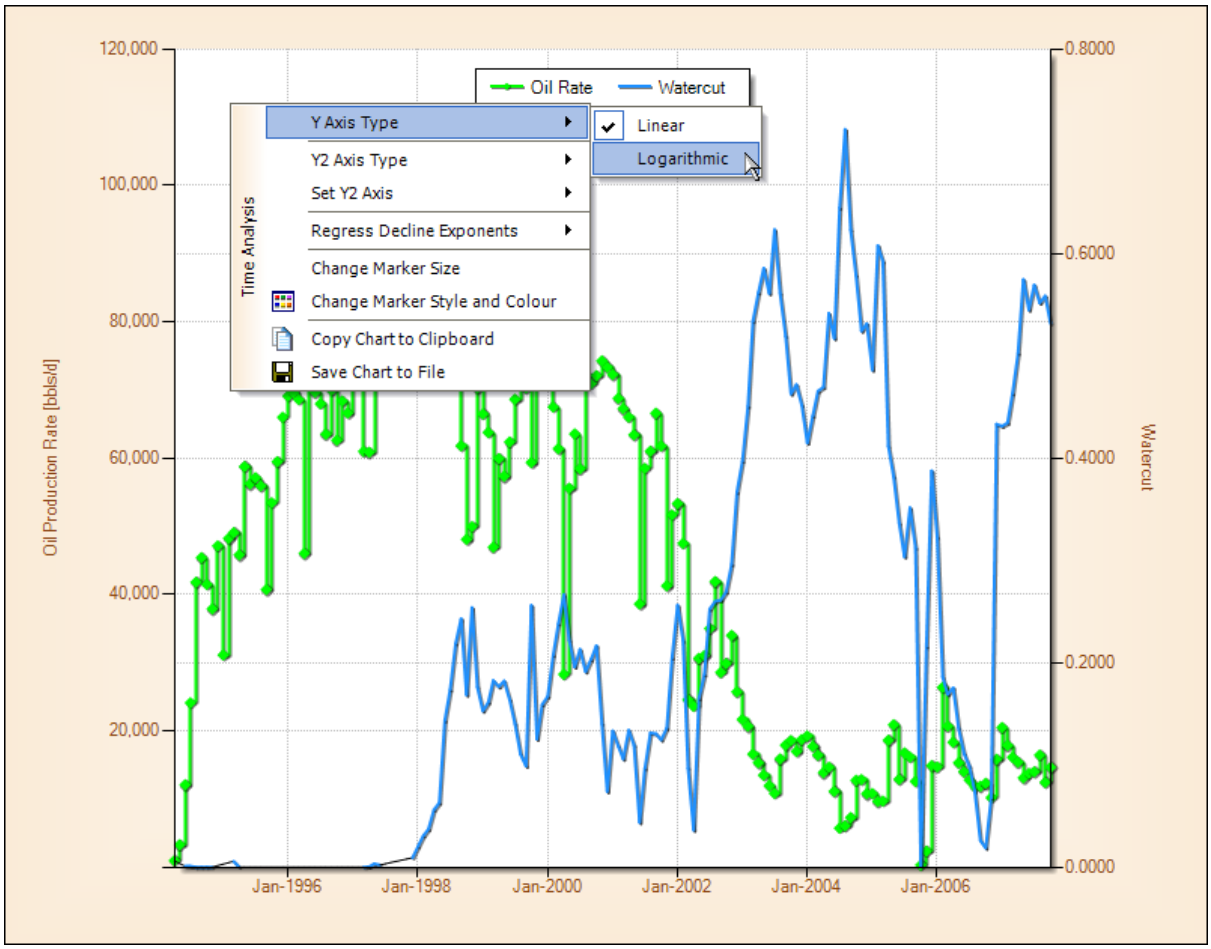
4.1 Oil Production

Within the Time Analysis section, the user can display numerous production and injection rates and ratios versus time.

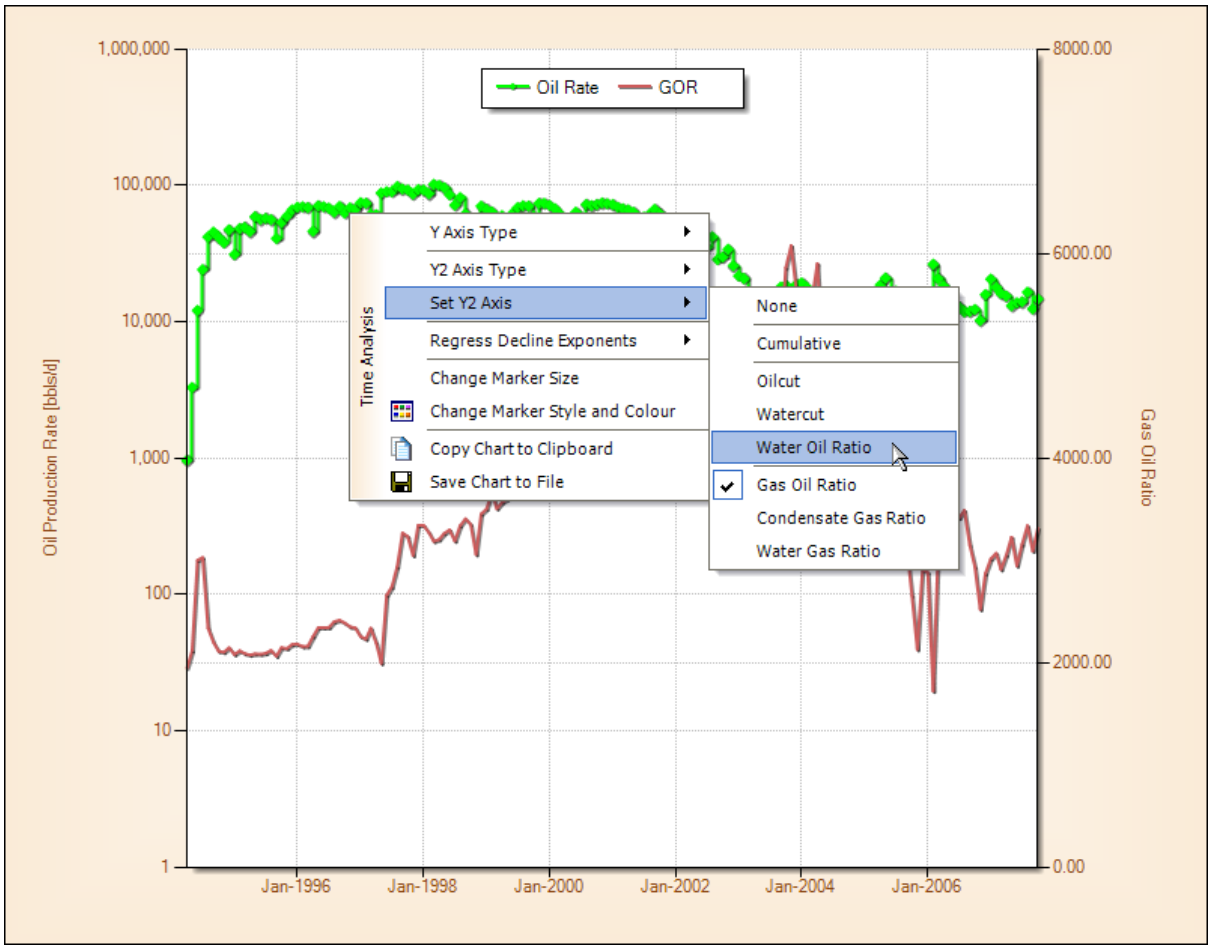
The user can also perform decline curve analysis on both the Oil and Gas production rate, for exponential, harmonic and hyperbolic decline curve equations.



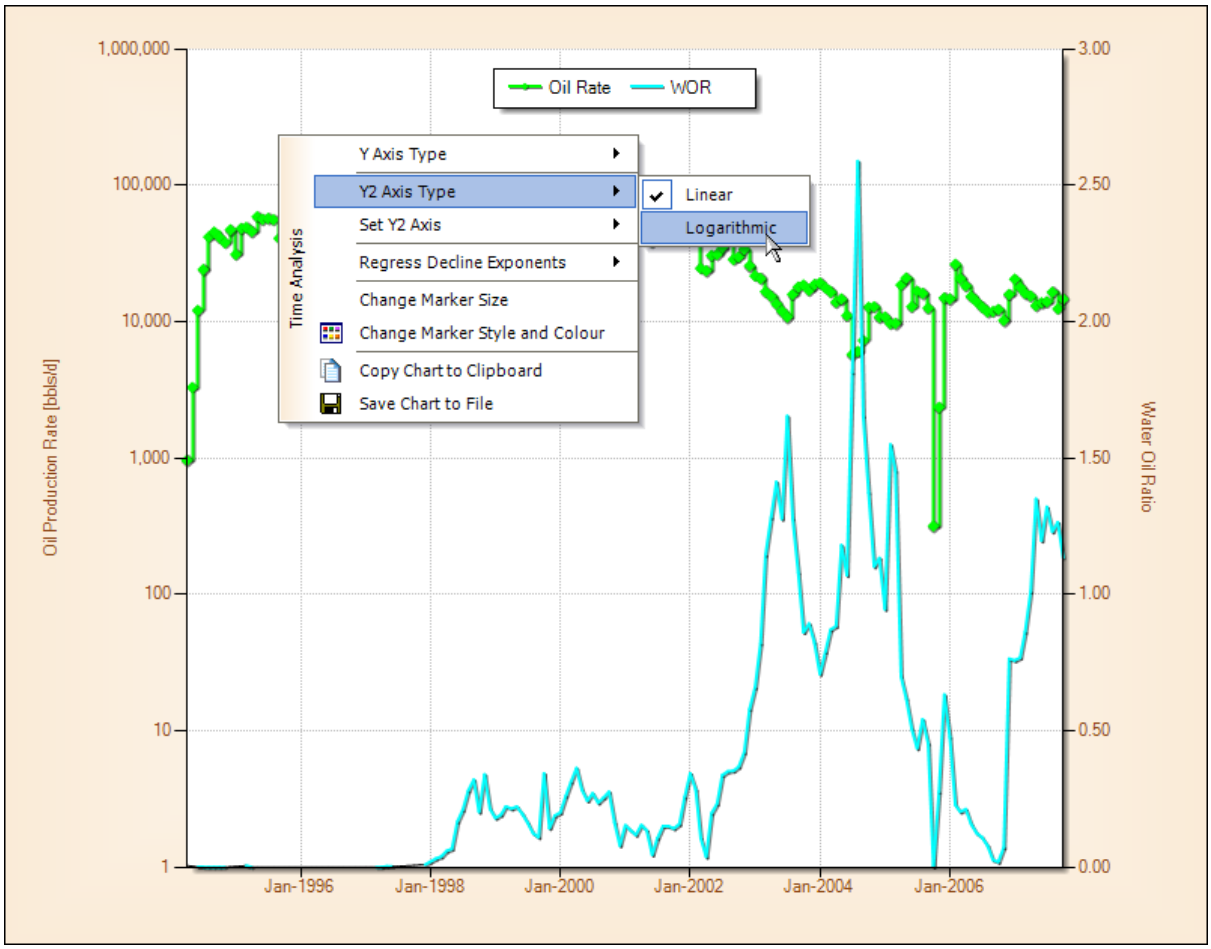
The user can choose between linear and logarithmic Y axis display by selecting the chart context menu with a single right mouse click. See screen capture provided below.



Many other production ratios are provided as a secondary Y axis display, to help in the field production profile and decline curve selection. These can be changed again via the chart context menu as shown below.

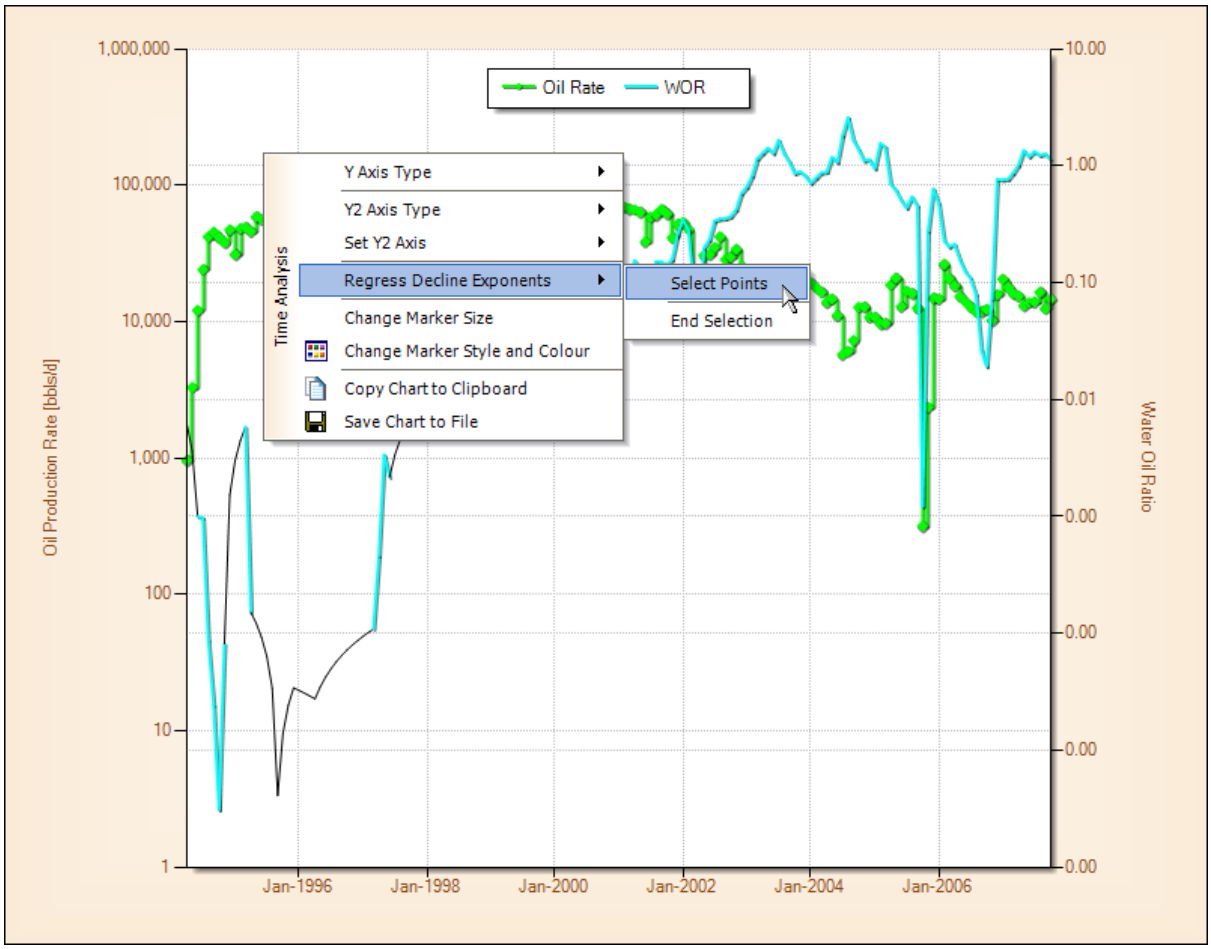


The user can also choose to display the secondary Y axis as either linear or logarithmic. See screen capture provided below.

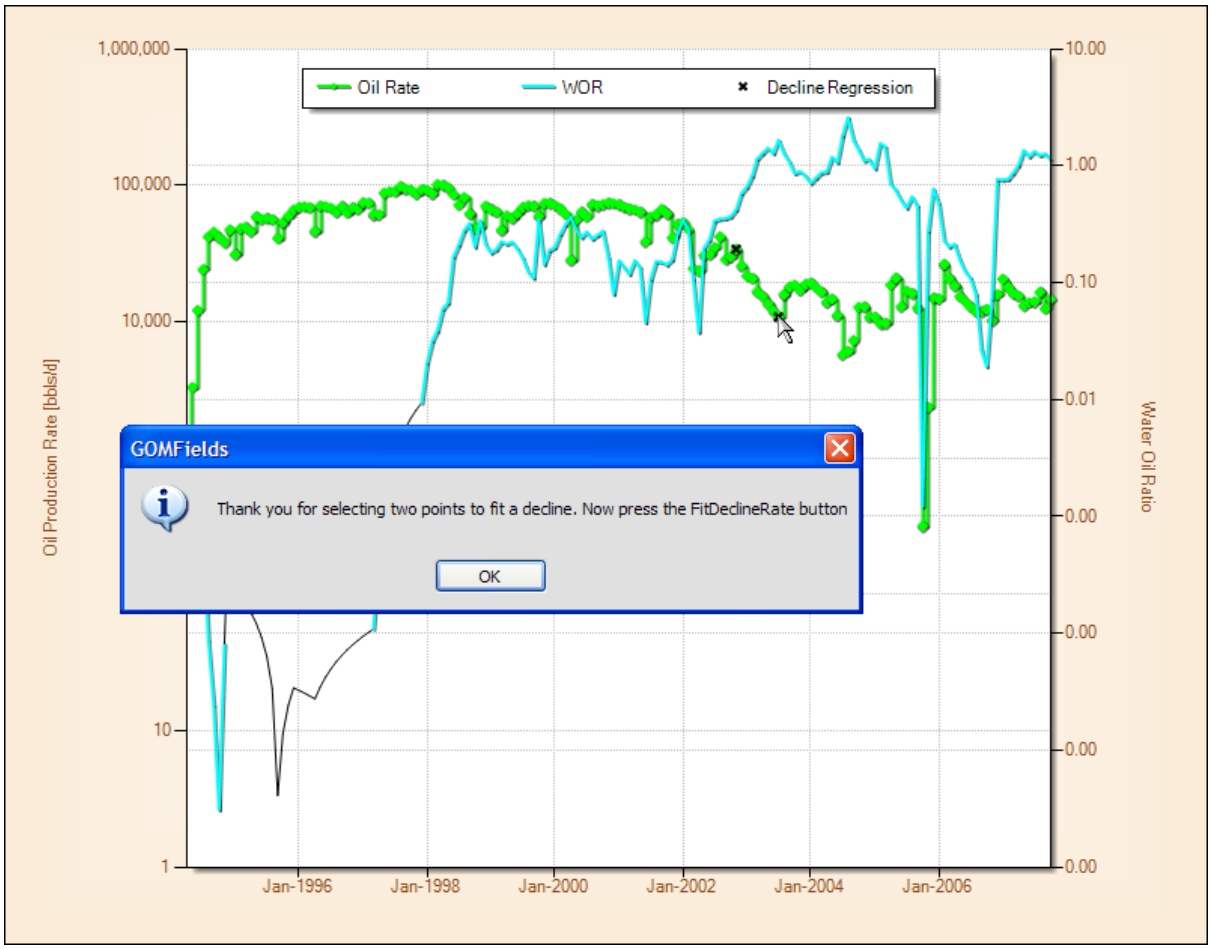


Regress Decline Exponents

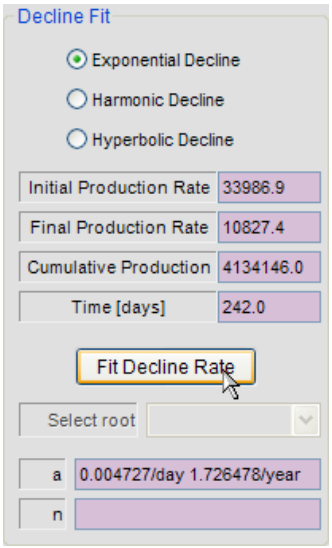
To select points for decline curve analysis, first select the Regress Decline Exponents then Select Points menu item, as shown below.

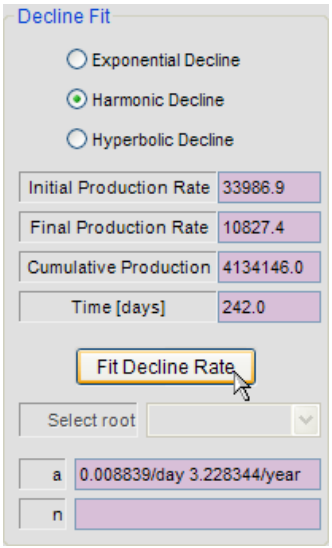


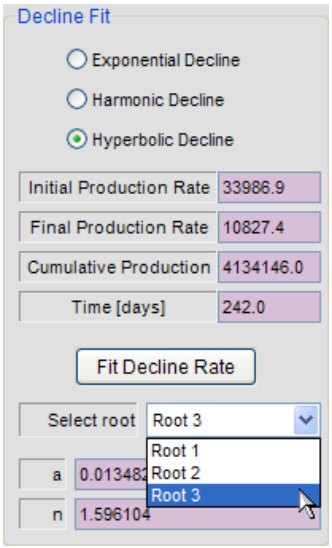
Once the user has selected 2 points a message box will pop up acknowledging the fact that 2 points were digitized. The user can them choose to fit a decline type, either Exponential, Harmonic or Hyperbolic.



Examples of each decline type are shown below.







Where,

- a = Constant decline rate fraction, between 0 and 1

- n = additional hyperbolic constant decline exponent, typically between 0 and 1

Special cases for the hyperbolic decline equation occur at n=0 [exponential decline] and n=1 [harmonic decline].

The following text is taken from "Petroleum Engineering Handbook" published by the Society of Petroleum Engineers, page 40-26. "An analysis of a large number of actual production-decline curves assembled by Cutler indicates that most decline curves normally encountered are of the hyperbolic type, with values for the exponent n between 0 and 0.7, while the majority fall between 0 and 0.4."

For both the exponential and harmonic decline curves, the exponent 'a' can be solved by re- arranging their decline curve equations to the following :

Exponential Equation

$$a = \frac{\ln\left(\frac{q_i}{q}\right)}{t}$$

Harmonic Equation

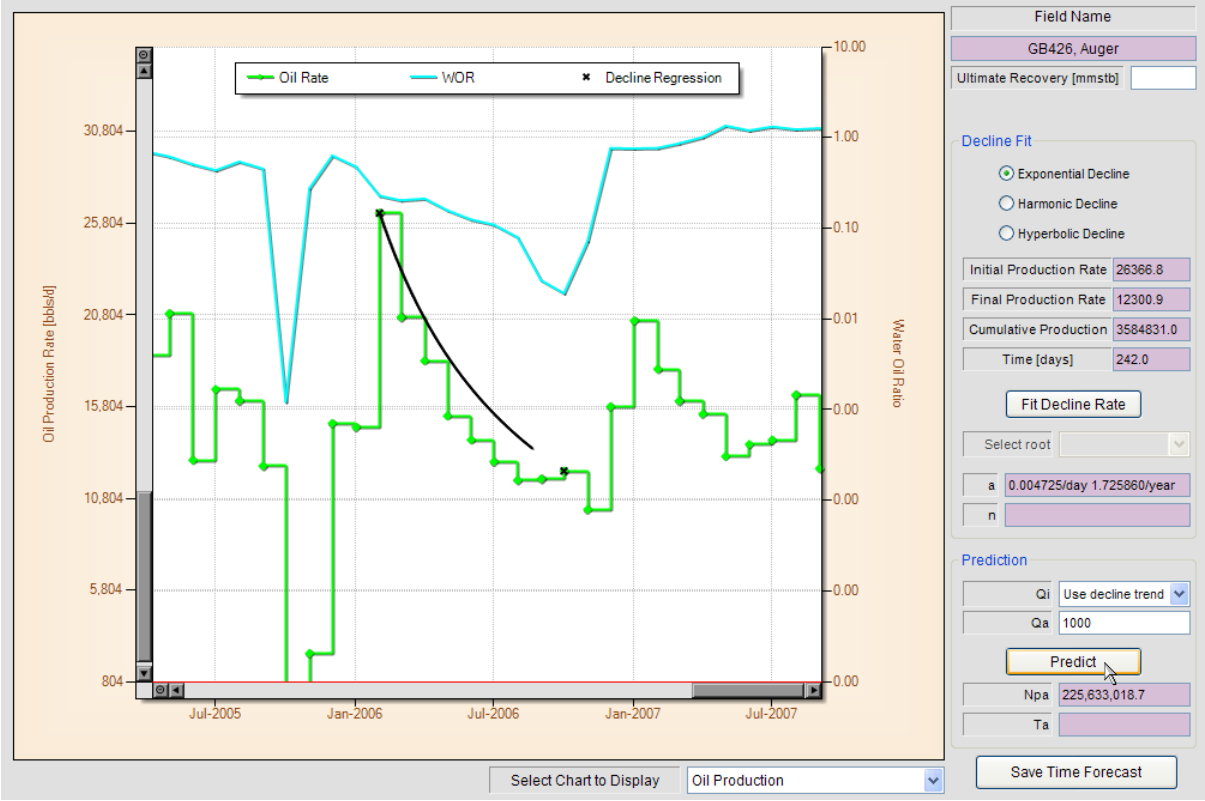
$$a = \frac{\left(\frac{q_i}{q} - 1\right)}{t}$$

The solution of the hyperbolic parameters are based on the technique described in the following Society of Petroleum Engineers paper, where an additional parameter Cumulative production, Np, is required.

"A Numerical Solution to Two-Parameter Representation of Production Decline Curve Analysis", SPE16505, B. Agbi and M Ng, 1987

The solution of the hyperbolic decline curve equation for values of 'a' and 'n' displays all roots of the equation, including values of 'a' at n=0 (exponential decline) and n=1 (harmonic decline). Typically, the value of 'n' at Root 2 is between 0 and 1.

Once the user has selected the Decline Type and pressed the **Fit Decline Rate** button, they can then approximately calculate the likely Ultimate Recovery at abandonment and Abandonment date. Should the user want a more accurate prediction of the Ultimate Recovery at abandonment and Abandonment date, then they should use



For completeness, the equations used to calculate these Ultimate Recoveries and abandonment dates are provided below, where qi is the first digitized point and the Initial Production Rate.

Exponential Decline

Ultimate Recovery Equation

$$N_{pa} = \frac{1}{a} \times (q_i - q_a)$$

Abandonment Time Equation

$$T_a = \frac{\ln\left(\frac{q_a}{q_i}\right)}{-a}$$

Harmonic Decline

Ultimate Recovery Equation

$$N_{pa} = \frac{q_i}{a} \times \ln\left(\frac{q_i}{q_a}\right)$$

Abandonment Time Equation

$$T_a = \frac{\left(\frac{q_a}{q_i} - 1\right)}{a}$$

Hyperbolic Decline

Ultimate Recovery Equation Abandonment Time Equation

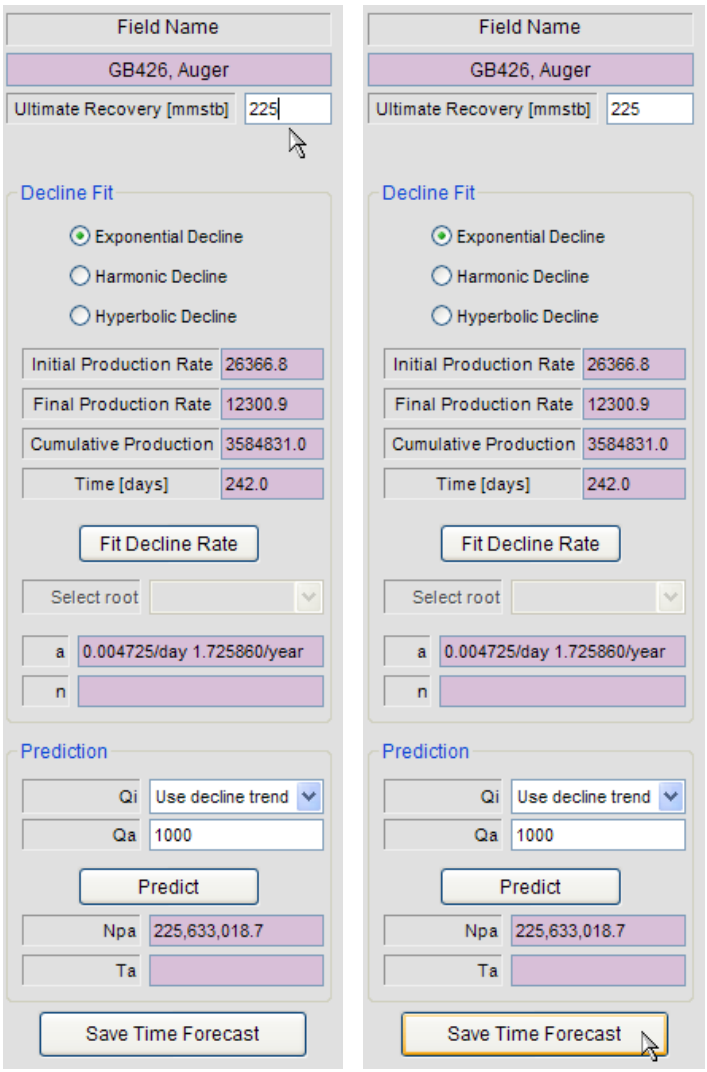
$$N_{pa} = \frac{q_i}{(1-n)\times a}\times\left(1-\left(\frac{q_i}{q_a}\right)^{(1-n)}\right) \qquad T_a = \frac{\left[\frac{\left(\left(q_i/q_a\right)^n - 1\right)}{n}\right]}{a}$$

Assuming a decline curve analysis has been performed on the Oil Production Rate, the user should press the **Save Time Forecast** button to ensure that the digitized points, decline and prediction parameters are saved.

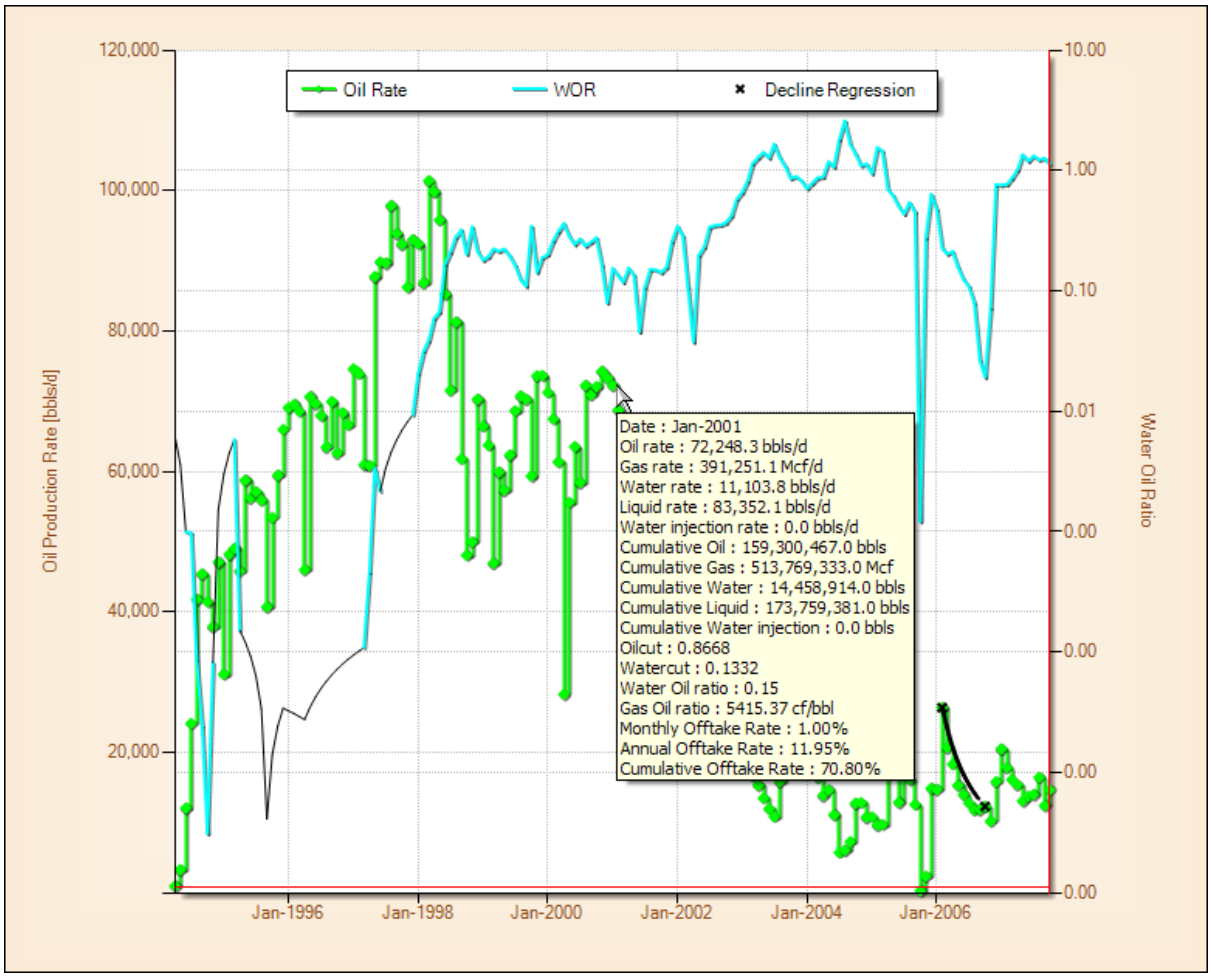
Offtake Rates, Formation Volume Factors and Chart Tooltips

Once the user has determined the likely Ultimate field Recovery based either on the Rate vs Time analysis or any of the Rate or Ratio vs Cumulative analysis, then they can choose to input this figure into the Ultimate Recovery input box, as shown below.

Also, should the user calculate a more accurate Cumulative Voidage Replacement, they can input values for produced Oil and Water formation volume factors as shown below. Once the user presses the **Save Time Forecast** button, as shown below, the calculation of Cumulative Voidage Replacement is updated and can be displayed in the Y2 axis by selecting Set Y2 Axis = Cumulative Voidage chart context menu item.



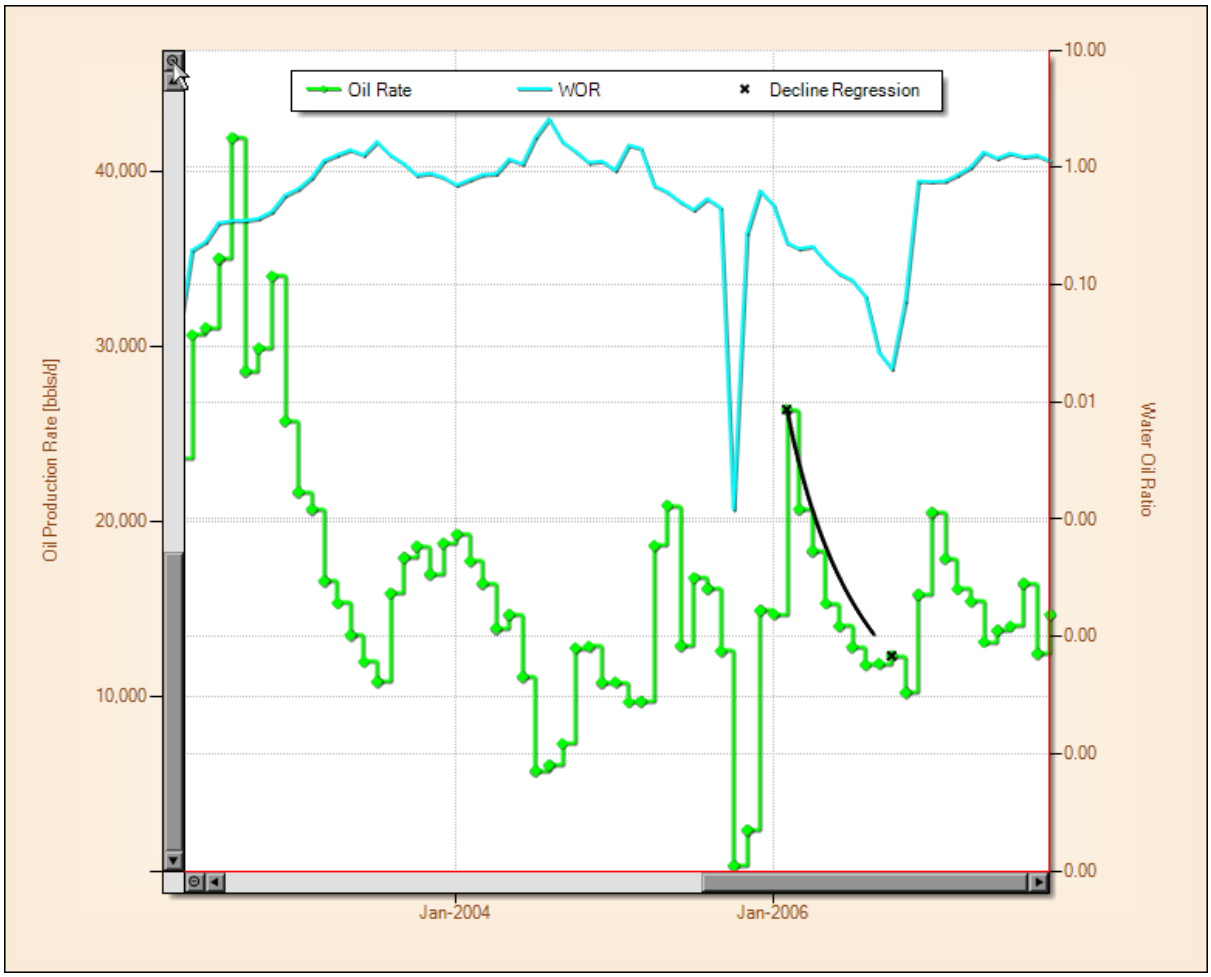
Once the Ultimate Recovery figure has been input into the text box, the user should press the **Save Time Forecast** button, as shown above. This will then enable the calculation of monthly, annual and cumulative offtake rates, which are displayed in the form of chart tooltips. See below.



Zooming and Unzooming within a Chart Area

Zooming within the chart area also couldn't be easier. Just single left-mouse click and drag the area of interest for zooming, as shown below.

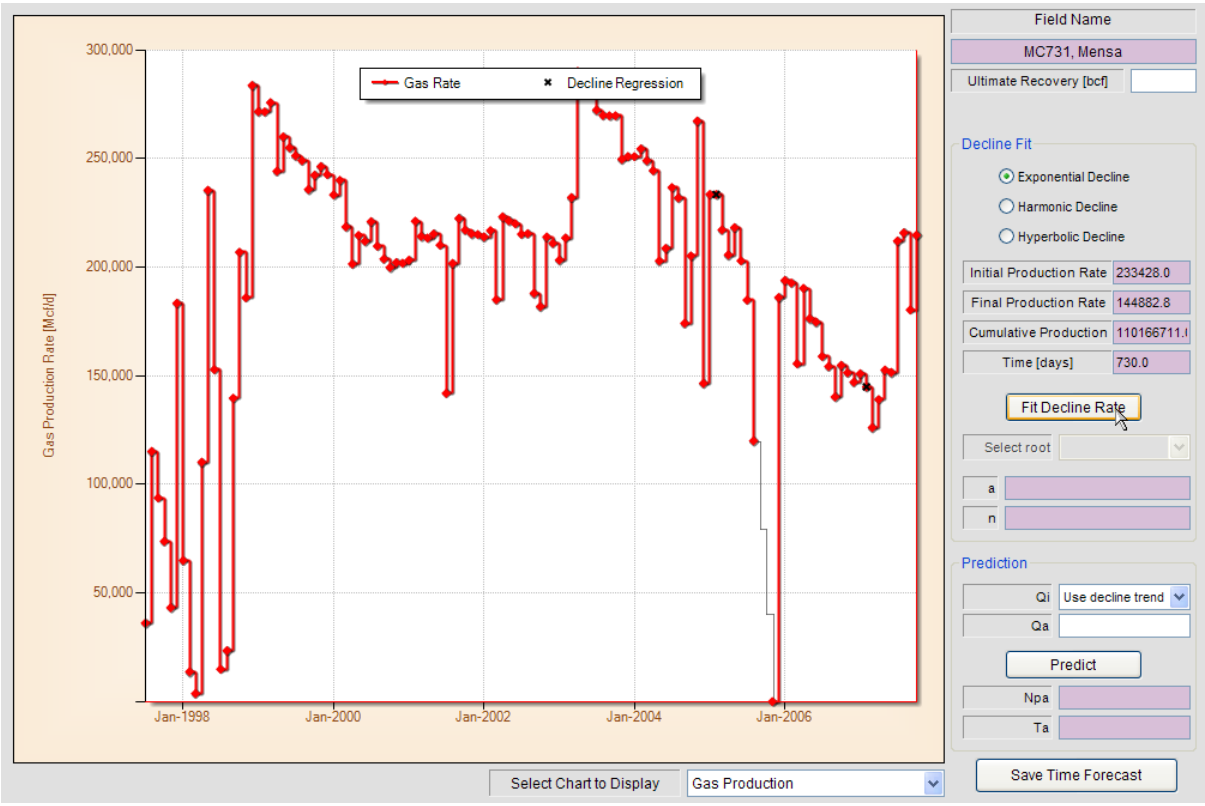
To unzoom simply single left mouse click one of the unzoom icons provided at the extremes of the axes scroll bars, as shown below.

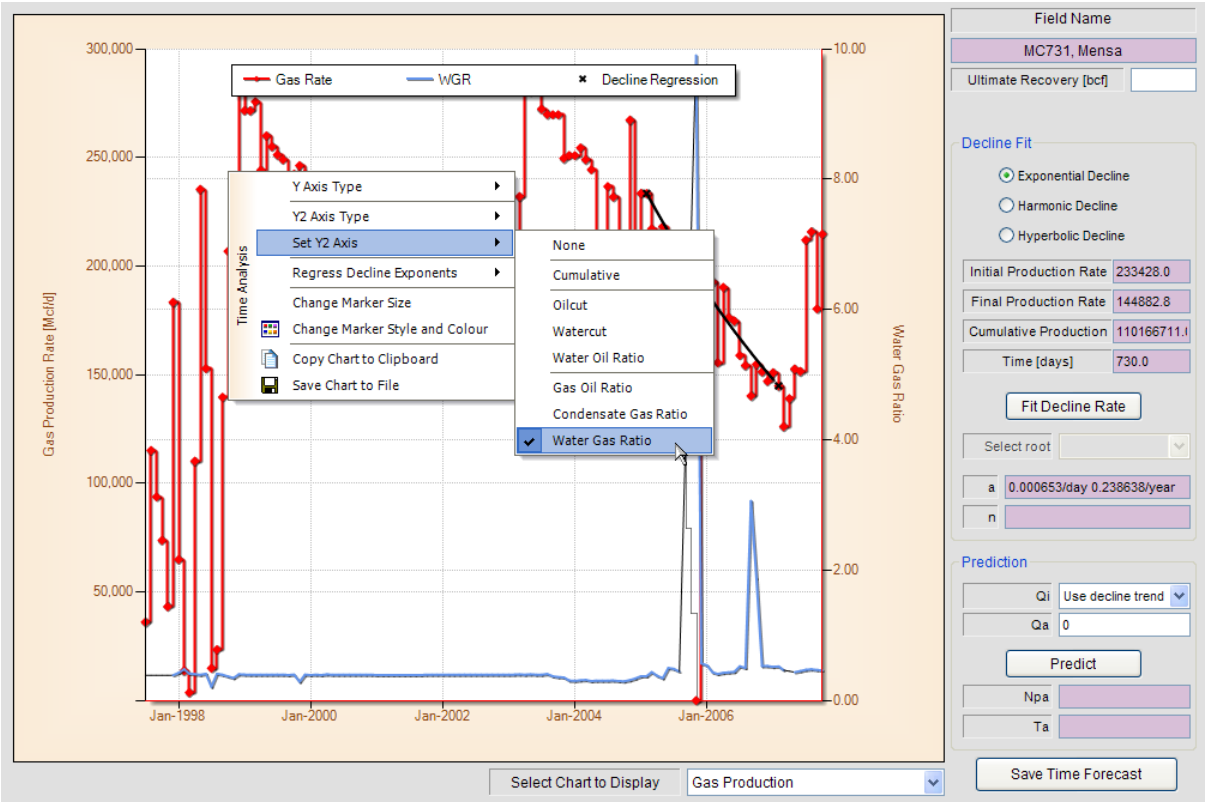


4.2 Gas Production

All of the same functionality that was presented in the Oil Production section is also available for Gas Production analysis, including decline curve analysis, chart tooltips, ultimate recovery and abandonment prediction.

Two specific examples are provided below, although the equations and methods are identical to the Oil Production section.





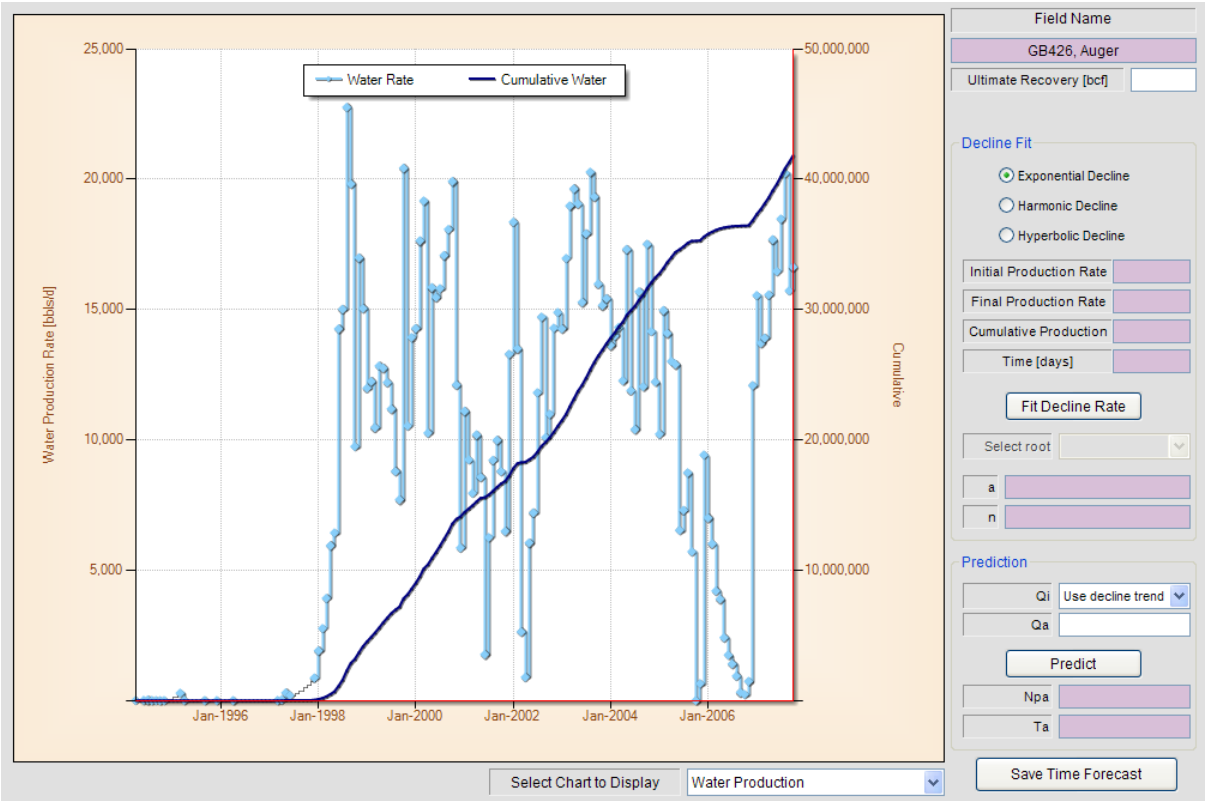
Assuming a decline curve analysis has been performed on the Gas Production Rate, the user should

press the **Save Time Forecast** button to ensure that the digitized points, decline and prediction parameters are saved.

4.3 Water Production

Water Production rate versus time is displayed as the primary Y axis in this display.

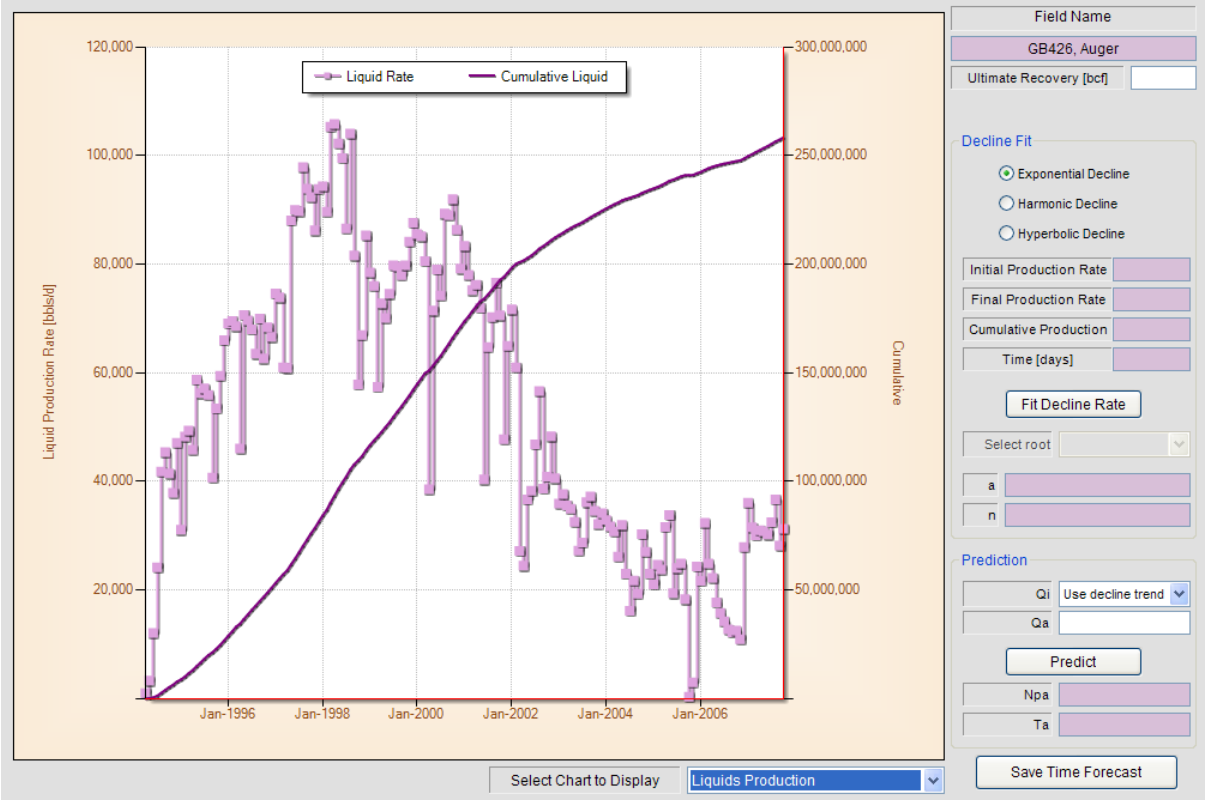
No decline curve analysis can be performed while within this display. All other chart functionality that was presented in the Oil Production Time Analysis section is available.



4.4 Liquid Production

Liquid Production (Oil + Condensate + Water) rate versus time is displayed as the primary Y axis in this display.

No decline curve analysis can be performed while within this display. All other chart functionality that was presented in the Oil Production Time Analysis section is available.



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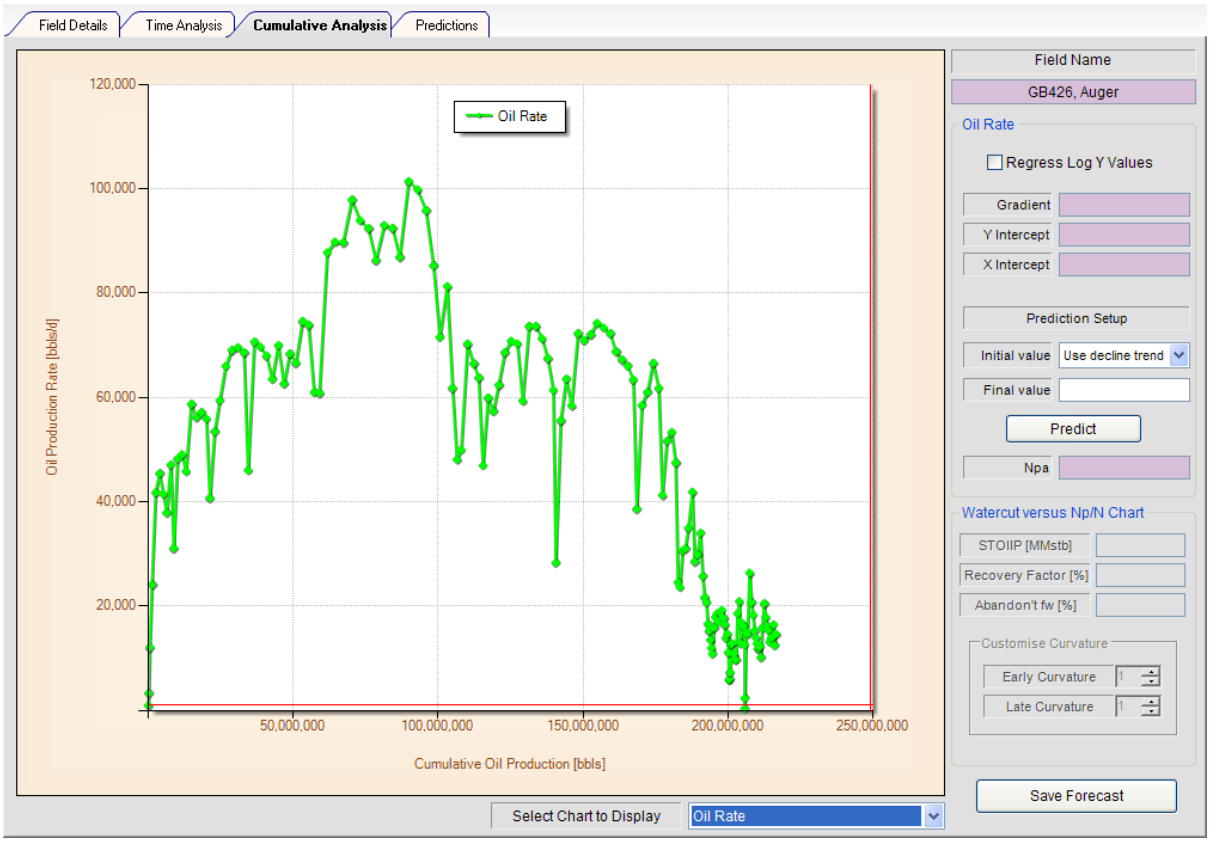
Part V

5 Cumulative Analysis

5.1 Oil Rate

Within the Cumulative Analysis section, the user can display numerous production and injection rates and ratios versus Cumulative Production.

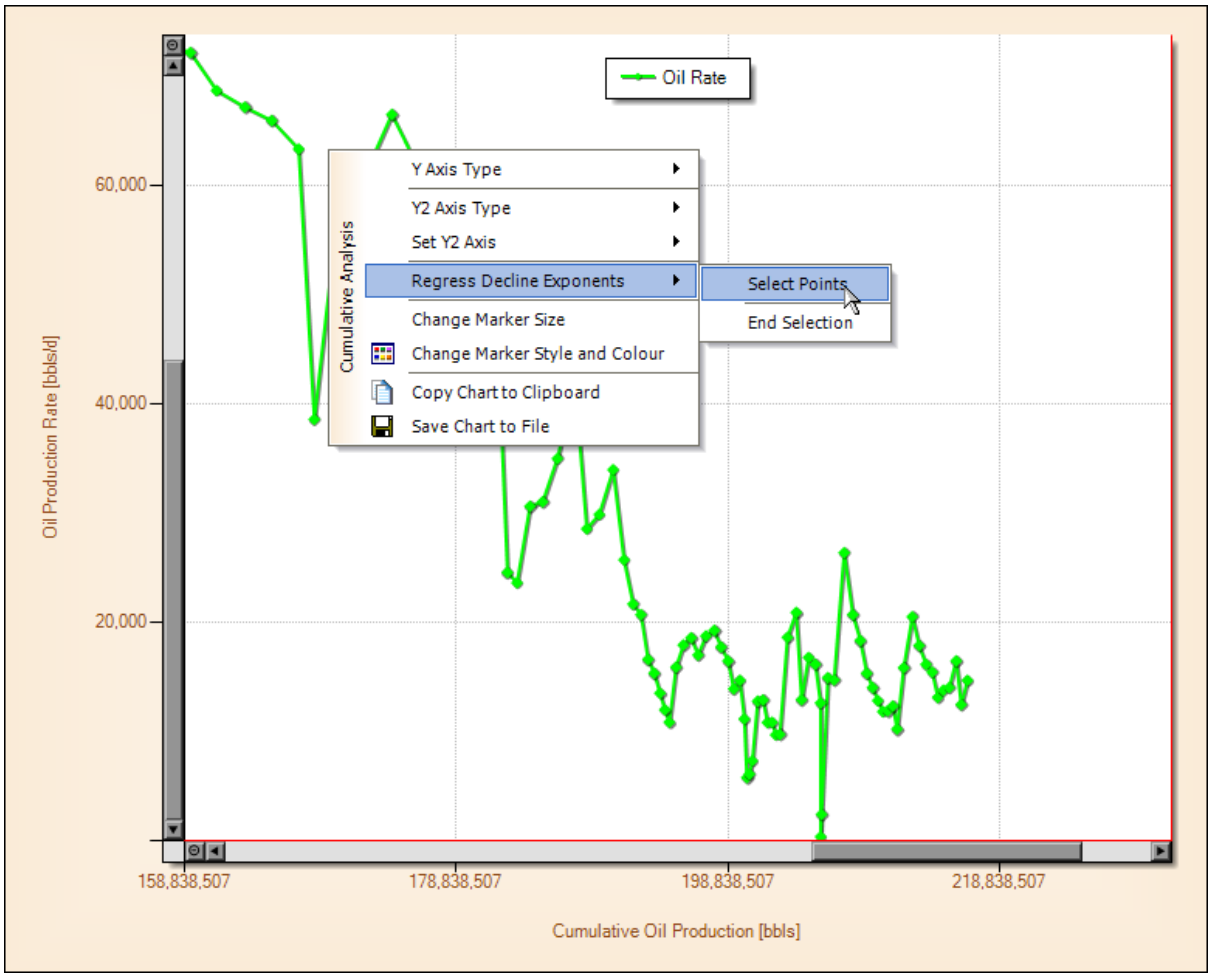
The user can also perform linear or semi-logarithmic decline curve analysis for Oil Rate, Gas Rate, Oilcut, Watercut and Water Oil Ratio versus Cumulative Production.



Regress Decline Exponents

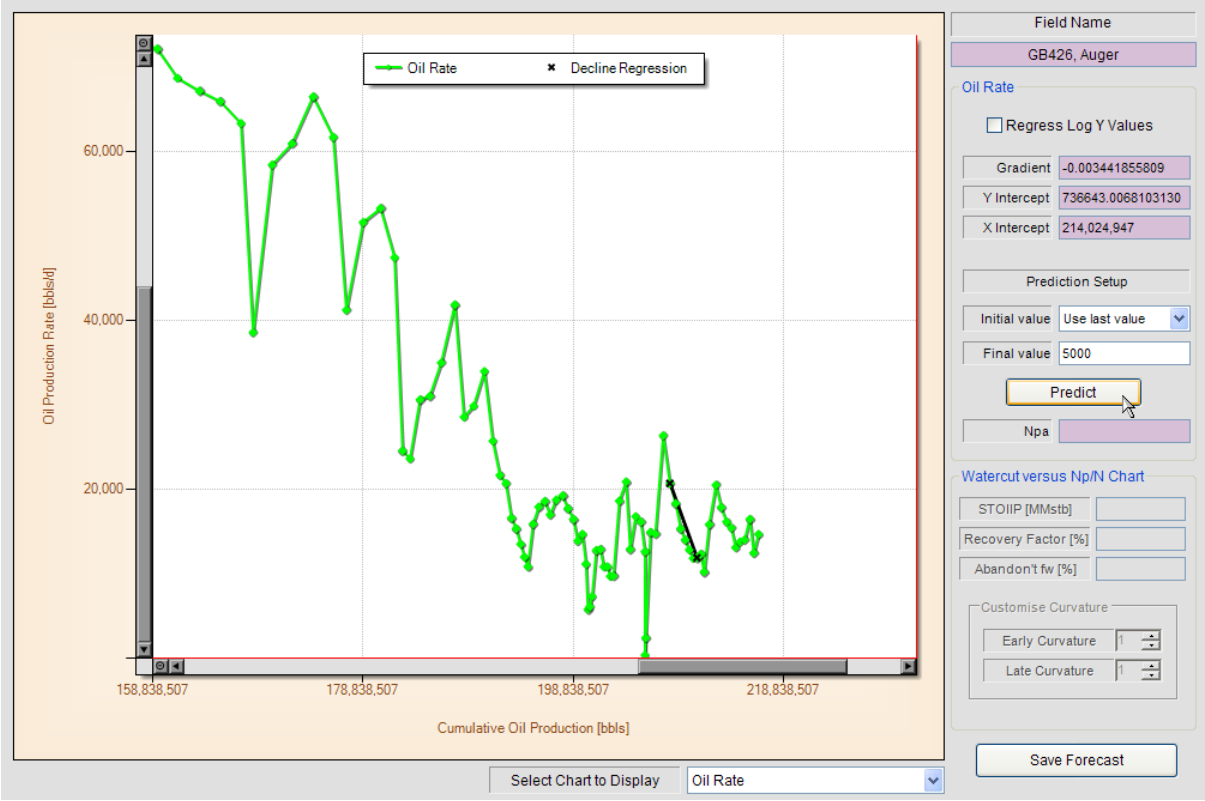
The method to regress decline exponents is identical to the Oil and Gas Rate versus Time Analysis, presented is earlier sections.

First select the Regress Decline Exponents then Select Points chart context menu item, as shown below. Then digitize two points on the chart

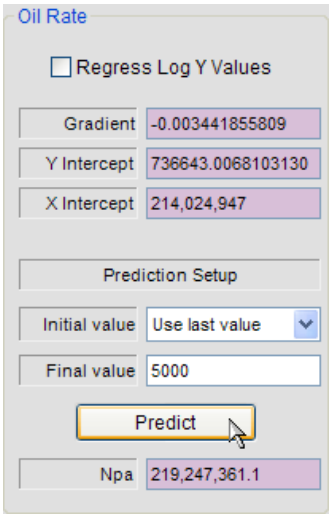


Once the user has selected two points, a message box will popup notifying the user that 2 points have been selected. The application will automatically fit a straight line between these 2 digitized points, and report the gradient and intercept of this line, as shown below.

The user can choose to fit a semi logarithmic straight line, by selecting the Regress Log Y Values check box, also shown below, assuming this is checked then the application will automatically update the fit, and report the revised gradient and intercept of this line.



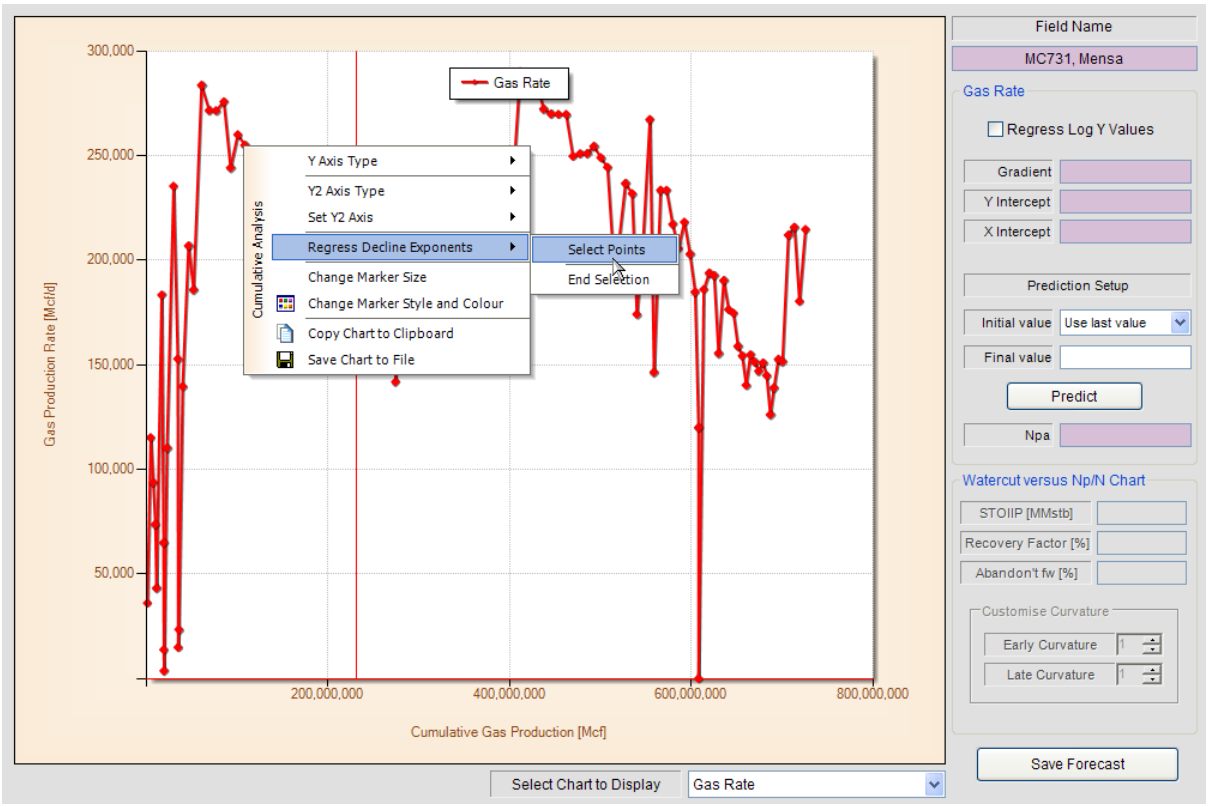
The user can also calculate an approximate Ultimate Recovery, by selecting between using the decline trend or last production value and inputting a final abandonment production value. The user should then press the **Predict** button, as shown above, to extrapolate the line to the abandonment value. See calculated result below.

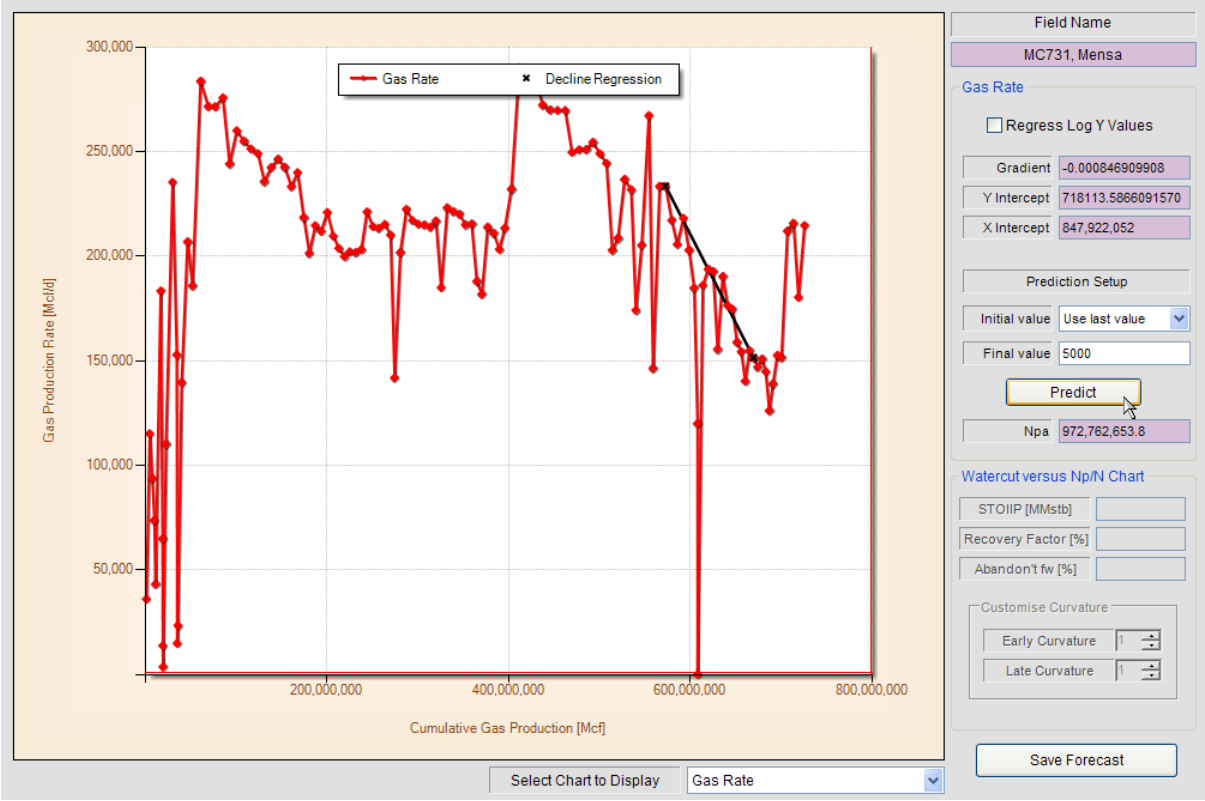


5.2 Gas Rate

Again, all of the same functionality that was presented in the Oil Production Vs Cumulative analysis section is also available for Gas Production analysis, including decline curve analysis, chart tooltips, and ultimate recovery at abandonment prediction.

Two specific examples are provided below, although the equations and methods are identical to the Oil Production section.

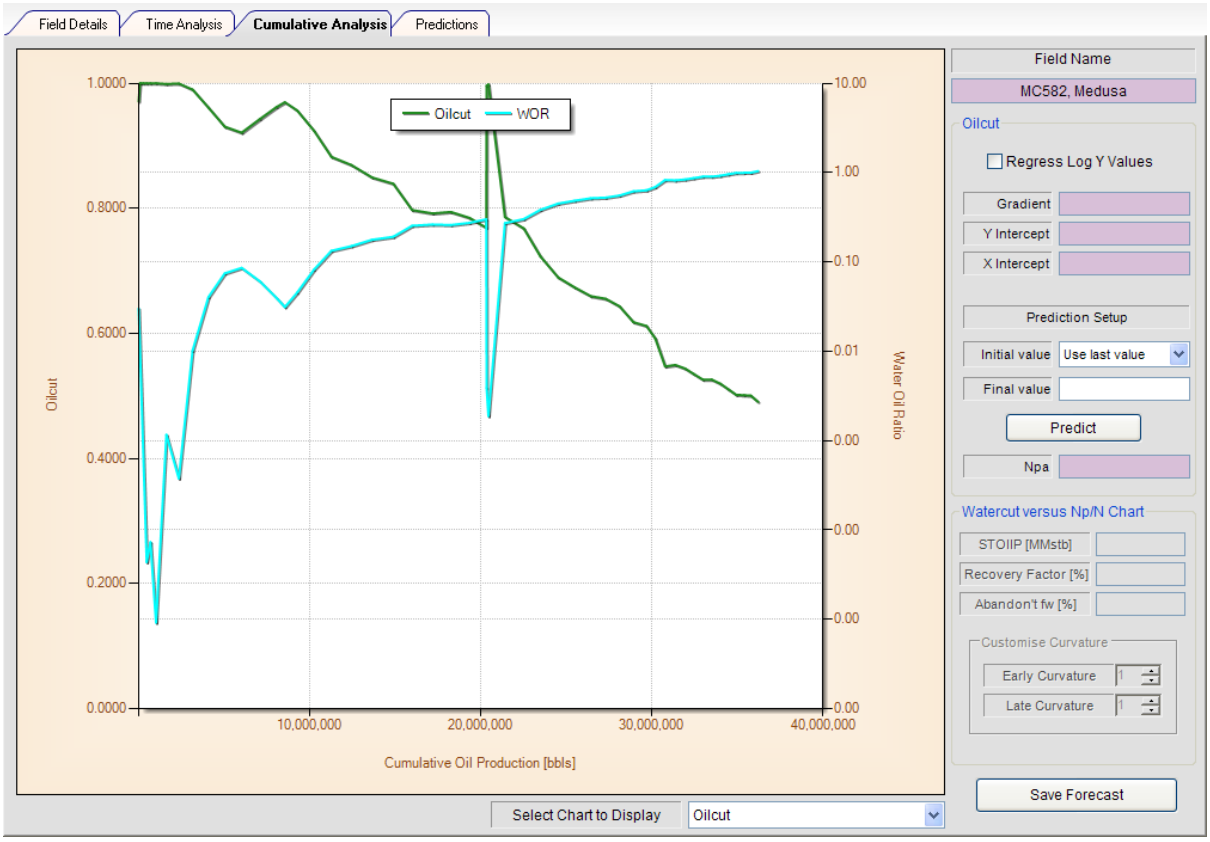




5.3 Oilcut, Watercut and Water Oil Ratio

Again, all of the same functionality that was presented in the Oil Production vs Cumulative analysis section is also available for either Oilcut, Watercut or Water Oil Ratio versus Cumulative Production analysis, including decline curve analysis, chart tooltips, and ultimate recovery at abandonment prediction.

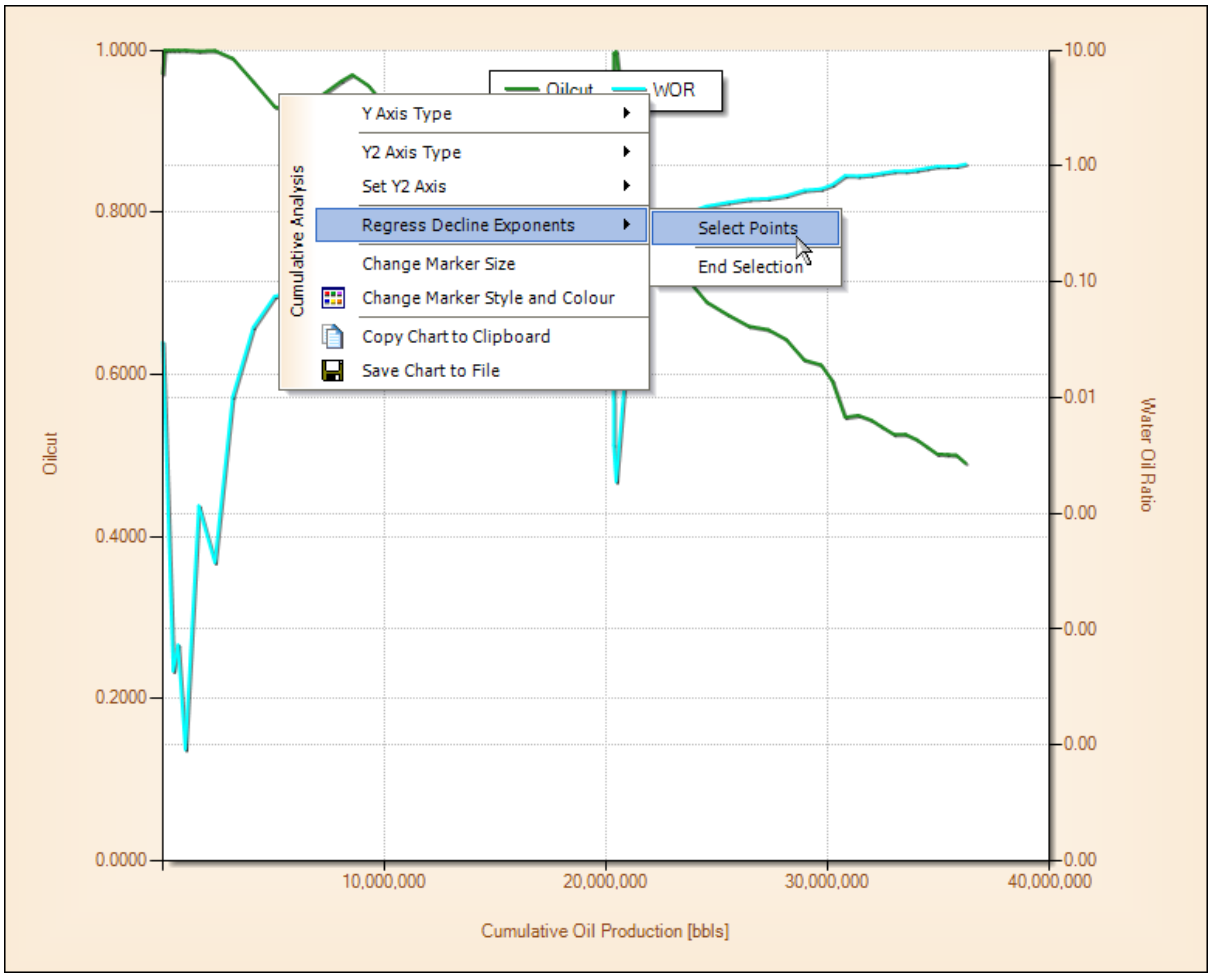
Specific examples are provided for completeness below, although the equations and methods are identical to the Oil Production section.



Regress Decline Exponents

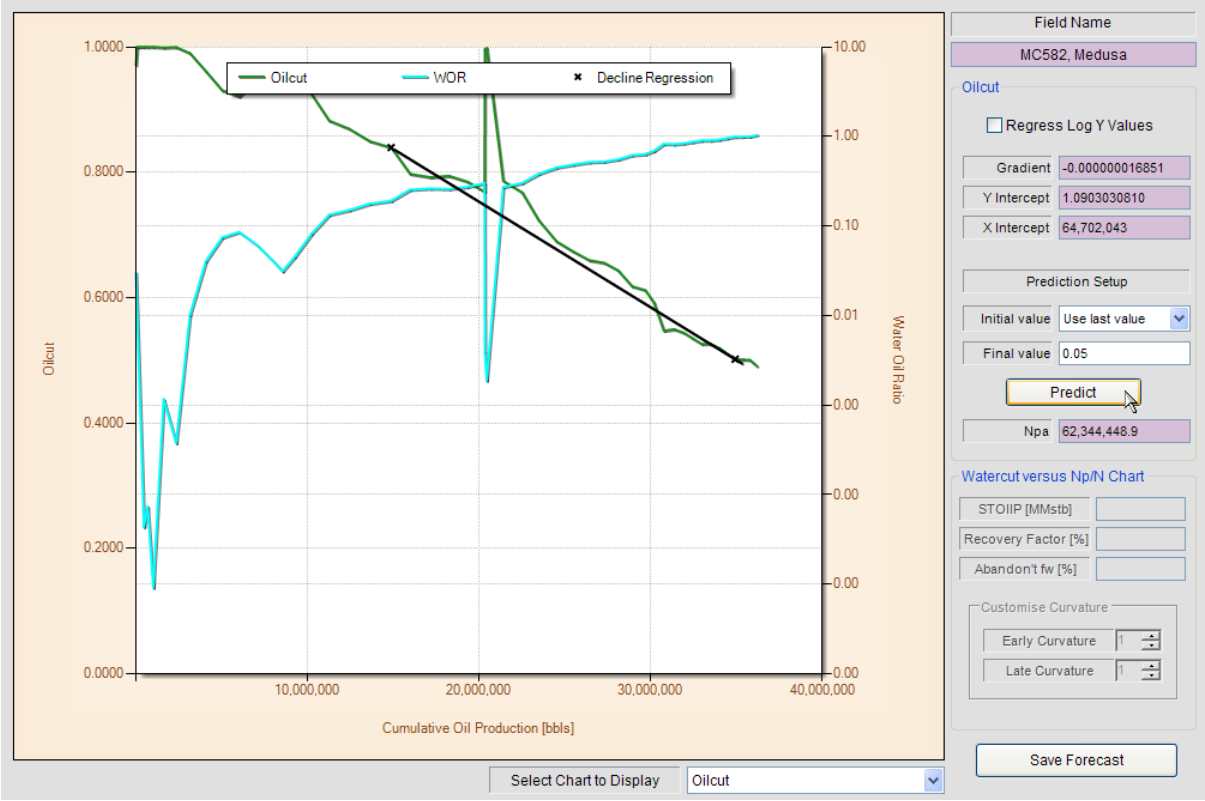
The method to regress decline exponents is identical to the Oil and Gas Rate versus Cumulative Analysis, presented is earlier sections.

First select the Regress Decline Exponents then Select Points chart context menu item, as shown below. Then digitize two points on the chart

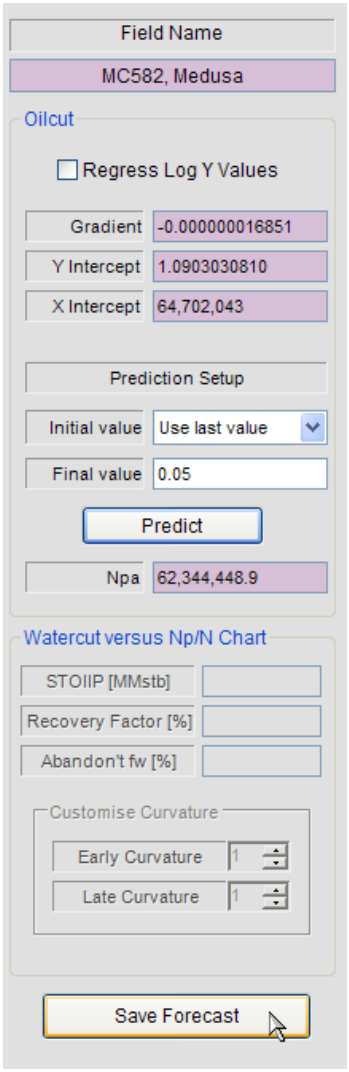


Once the user has selected two points, a message box will popup notifying the user that 2 points have been selected. The application will automatically fit a straight line between these 2 digitized points, and report the gradient and intercept of this line, as shown below.

The user can choose to fit a semi logarithmic straight line, by selecting the Regress Log Y Values check box, also shown below, assuming this is checked then the application will automatically update the fit, and report the revised gradient and intercept of this line.



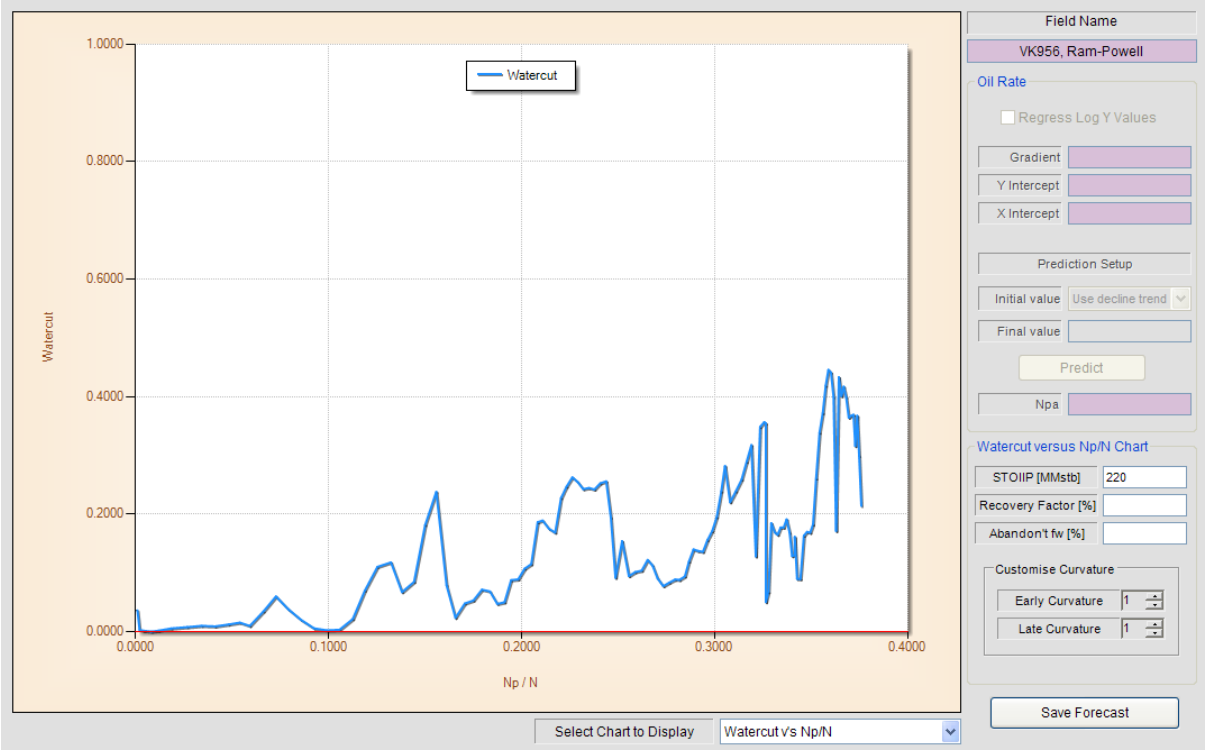
The user can also calculate an approximate Ultimate Recovery, by selecting between using the decline trend or last production value and inputting a final abandonment production value. The user should then press the **Predict** button, as shown above, to extrapolate the line to the abandonment value. See calculated result below.



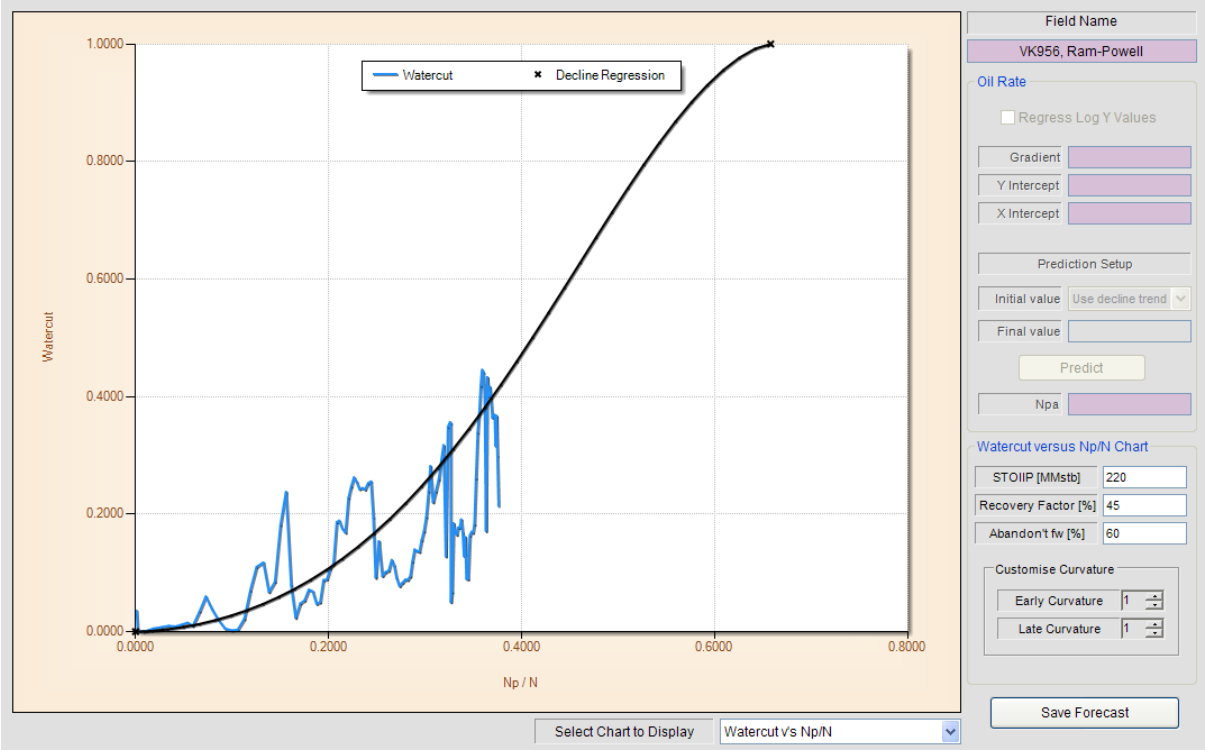
5.4 Watercut v's Np/N

The Watercut versus Np/N chart can be seen as a measure of the waterdrive efficiency of a specific oil field, which is typically linked to the degree of vertical permeability heterogeneity and the oil / water viscosity contrast. The chart requires additional estimated values for original in-place volumes (STOIIP), a likely abandonment ultimate recovery factor and an abandonment watercut. See below.

This chart can also be used as a data source for our other application ***Profile***, which is a generic Production Profile Generation and Analysis application. See our homepage for more details www. PetroleumSolutions.co.uk.

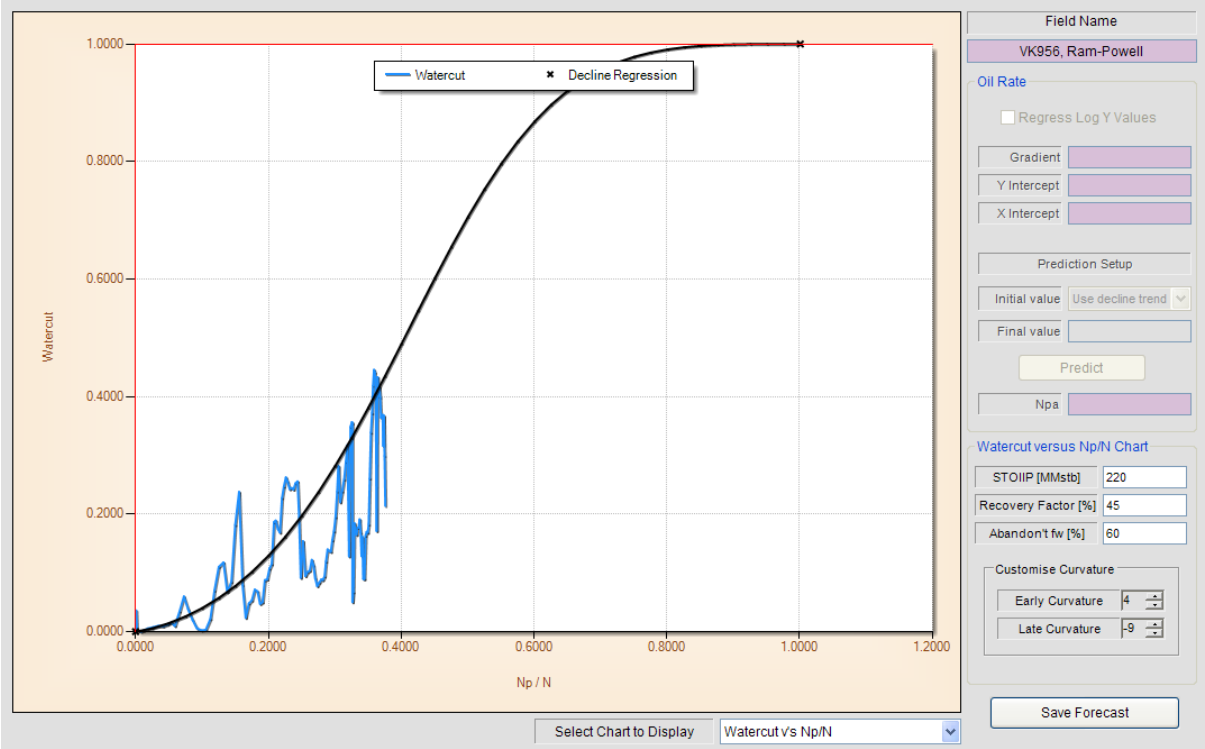


Once these 3 additional values have been input the user can start to iterate values for early and late watercut curvature.



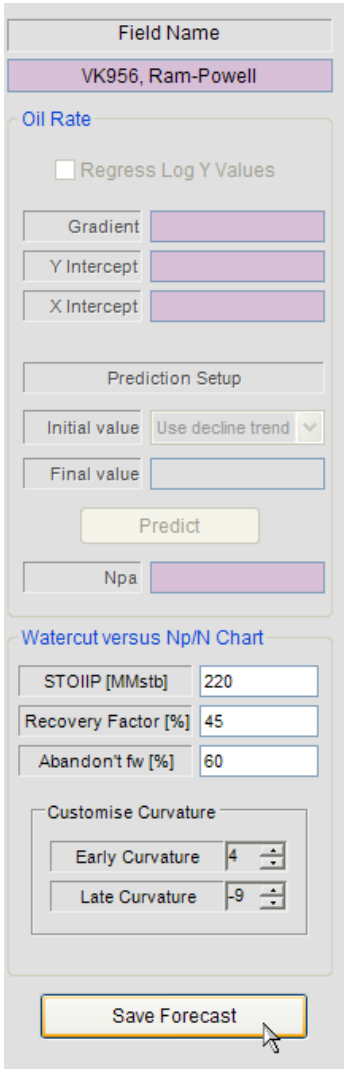
Negative values of early curvature generally translate to a delayed water production breakthough,

potentially implying good piston-like waterdrive efficiency. Highly positive of early curvature translate in rapid water breakthrough, potentially implying an adverse or poor waterdrive application, with likely high permeability streaks and/or high oil / water viscosity contrast. This situation will likely create poor vertical and/or areal sweep efficiency and create a high potential for bypassed oil.



Negative values of late curvature generally translate to a longer period of high water "tail" production, that asymptotes slowly towards the abandonment recovery factor and watercut levels. A positive value for late curvature, when combined with a negative value for early curvature is typically the best character for a waterdrive displacement process, and implies a delayed water breakthrough followed by a rapid watercut development to the likely high value of ultimate recovery factor. This is the ideal piston-like waterflood displacement process.

Should the user wish to save this match of watercut Vs Np/N, they should simply select the **Save Forecast** button, as shown below.



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Part VI

6 Predictions

For all the decline curves that were saved during the Time Analysis and Cumulative Analysis sections, the user now has the ability to forecast on a monthly basis the likely future oil, gas, water and liquid production profiles.

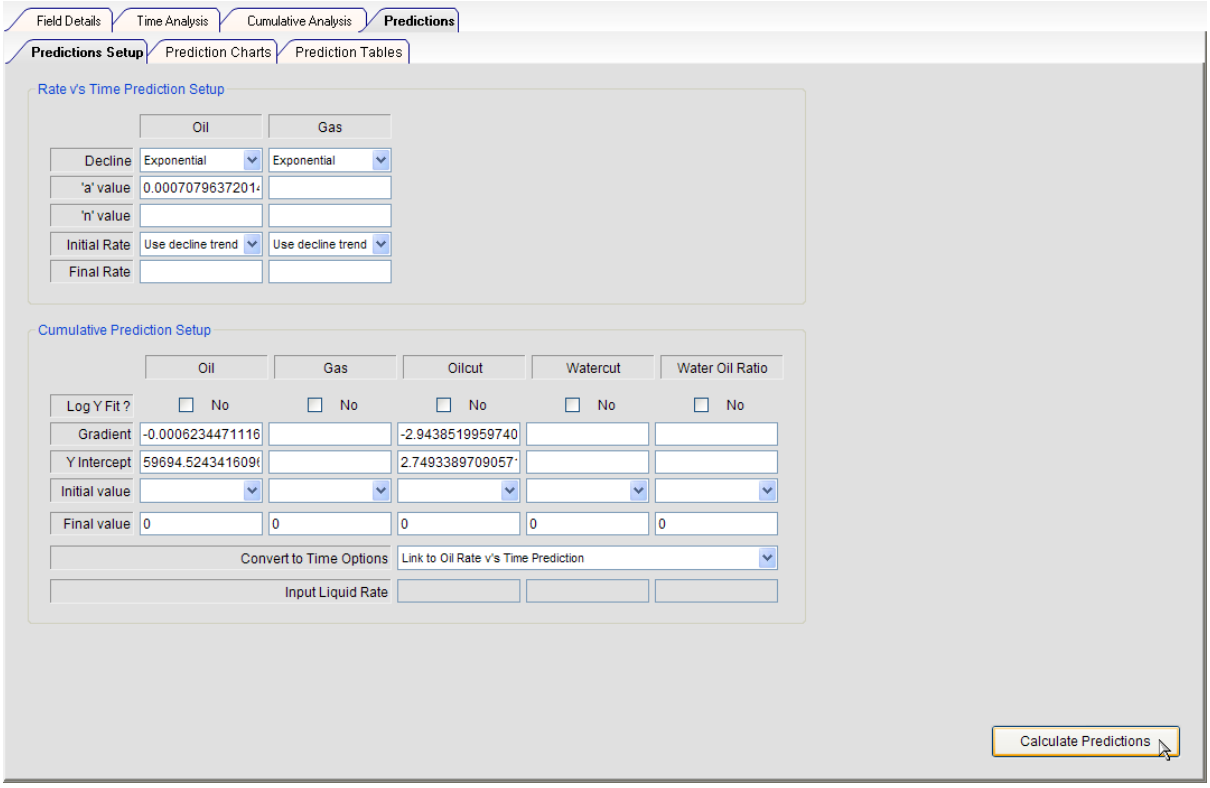
For the Oil and Gas rate versus time, the prediction setup is simple and is highlighted at the top of the screen capture below. The uses the calculated and saved decline curve parameters and the user can change whether to forecast from the decline trend or use the last historical production rate; the user should also input the final abandonment prediction rate. Once the user presses the **Calculate Predictions** button, the application will simply progress monthly using the decline curve and prediction parameters until the abandonment production level is reached

For Oil and Gas rate versus Cumulative Production, the application progresses from month to month using the gradient and intercept relationship together with Newton-Raphson iteration to ensure that the monthly extrapolated production rates follow the original decline parameters.

The oilcut, watercut and water-oil ratio prediction methods use a similar extrapolation technique to the oil and gas rate versus cumulative production, however need to be linked to an oil production rate forecast or assume a constant liquid rate in order to convert these forecasts to time. As such the application provides three methods to generate this time forecast; namely

1. Link to Oil Rate v's Time Prediction
2. Link to Oil Rate v' Cumulative Prediction
3. Input Constant Liquid Rate Value

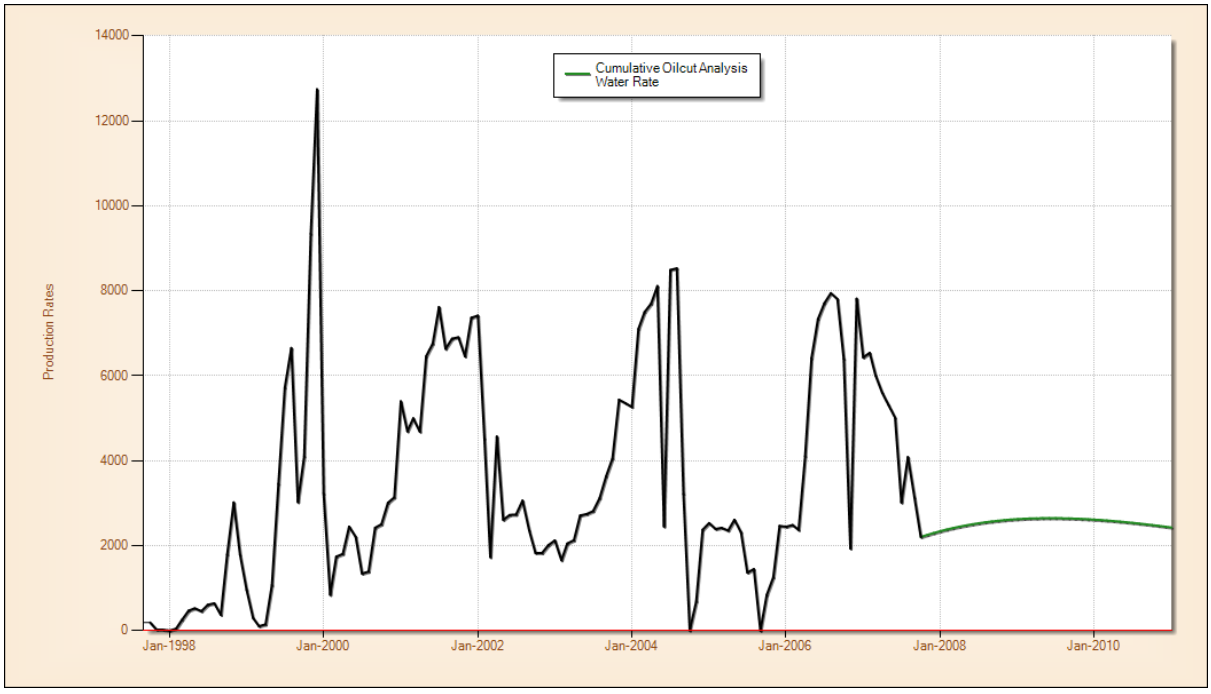
Examples of these options are highlighted below.

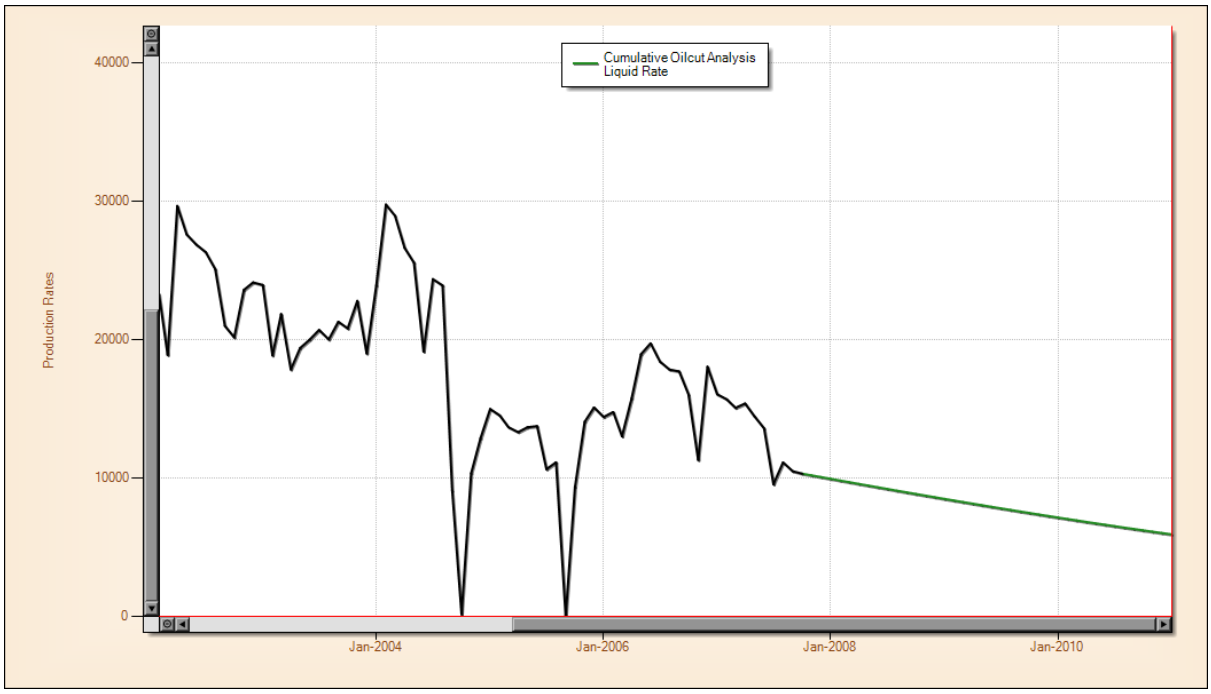


Once the user has successfully input all the appropriate data for a time forecast to be calculated and pressed the **Calculate Predictions** button, as shown above, then the Prediction Charts tab should contain an active chart with the predictions displayed.

The user can zoom in and scroll around the chart area to examine and compare the range of time forecasts calculated.

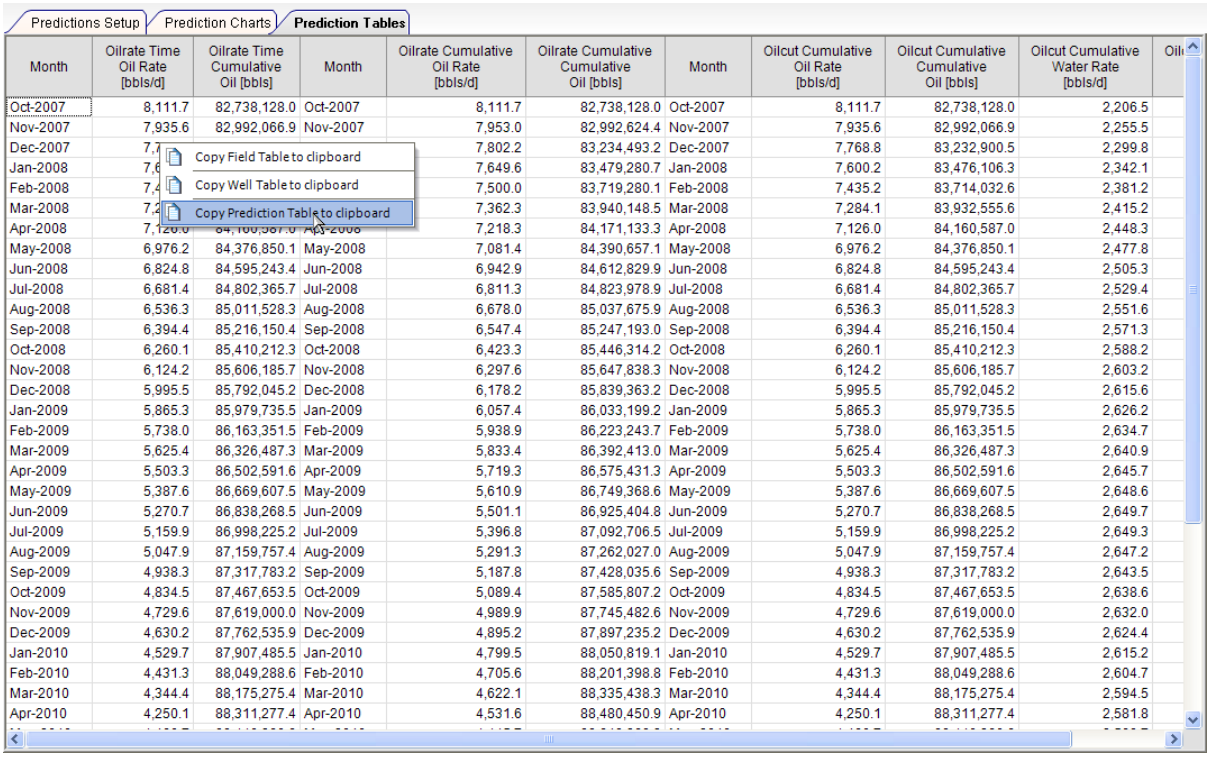
Assuming an oilcut, watercut or water oil ratio forecast was successfully calculated then the user can switch to the water production rate prediction chart, as shown below, and again choose to zoom in the examine these forecasts.





All of the forecasts that were calculated are reported in the Prediction Tables tab. The user can copy and paste the data from this table to external applications, via the two methods discussed below.

1. Either press the right mouse button once over any of the tables to activate the table context menu, as highlighted below, then select the various menu item to copy a specific table to the clipboard. See screen capture example below.
2. Or, simply select and drag an area with the mouse, then press the standard windows CTRL+C keys to copy the selected area to the clipboard.

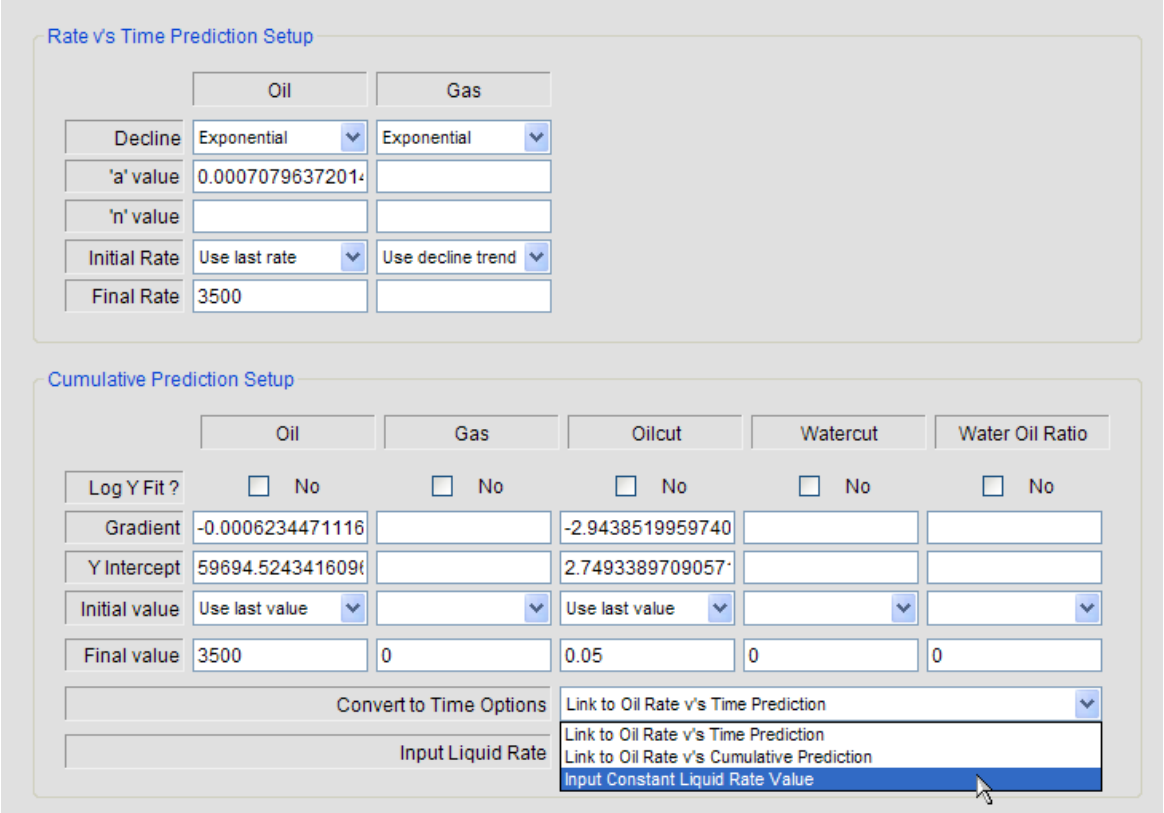


Month	Oilrate Time Oil Rate [bbls/d]	Oilrate Time Cumulative Oil [bbls]	Month	Oilrate Cumulative Oil Rate [bbls/d]	Oilrate Cumulative Cumulative Oil [bbls]	Month	Oilcut Cumulative Oil Rate [bbls/d]	Oilcut Cumulative Cumulative Oil [bbls]	Oilcut Cumulative Water Rate [bbls/d]	Oil
Oct-2007	8,111.7	82,738,128.0	Oct-2007	8,111.7	82,738,128.0	Oct-2007	8,111.7	82,738,128.0	2,206.5	
Nov-2007	7,935.6	82,992,066.9	Nov-2007	7,953.0	82,992,624.4	Nov-2007	7,935.6	82,992,066.9	2,255.5	
Dec-2007	7,7			7,802.2	83,234,493.2	Dec-2007	7,768.8	83,232,900.5	2,299.8	
Jan-2008	7,6			7,649.6	83,479,280.7	Jan-2008	7,600.2	83,476,106.3	2,342.1	
Feb-2008	7,4			7,500.0	83,719,280.1	Feb-2008	7,435.2	83,714,032.6	2,381.2	
Mar-2008	7,4			7,362.3	83,940,148.5	Mar-2008	7,284.1	83,932,555.6	2,415.2	
Apr-2008	7,126.0	84,160,587.0	Apr-2008	7,218.3	84,171,133.3	Apr-2008	7,126.0	84,160,587.0	2,448.3	
May-2008	6,976.2	84,376,850.1	May-2008	7,081.4	84,390,657.1	May-2008	6,976.2	84,376,850.1	2,477.8	
Jun-2008	6,824.8	84,595,243.4	Jun-2008	6,942.9	84,612,829.9	Jun-2008	6,824.8	84,595,243.4	2,505.3	
Jul-2008	6,681.4	84,802,365.7	Jul-2008	6,811.3	84,823,978.9	Jul-2008	6,681.4	84,802,365.7	2,529.4	
Aug-2008	6,536.3	85,011,528.3	Aug-2008	6,678.0	85,037,675.9	Aug-2008	6,536.3	85,011,528.3	2,551.6	
Sep-2008	6,394.4	85,216,150.4	Sep-2008	6,547.4	85,247,193.0	Sep-2008	6,394.4	85,216,150.4	2,571.3	
Oct-2008	6,260.1	85,410,212.3	Oct-2008	6,423.3	85,446,314.2	Oct-2008	6,260.1	85,410,212.3	2,588.2	
Nov-2008	6,124.2	85,606,185.7	Nov-2008	6,297.6	85,647,838.3	Nov-2008	6,124.2	85,606,185.7	2,603.2	
Dec-2008	5,995.5	85,792,045.2	Dec-2008	6,178.2	85,839,363.2	Dec-2008	5,995.5	85,792,045.2	2,615.6	
Jan-2009	5,865.3	85,979,735.5	Jan-2009	6,057.4	86,033,199.2	Jan-2009	5,865.3	85,979,735.5	2,626.2	
Feb-2009	5,738.0	86,163,351.5	Feb-2009	5,938.9	86,223,243.7	Feb-2009	5,738.0	86,163,351.5	2,634.7	
Mar-2009	5,625.4	86,326,487.3	Mar-2009	5,833.4	86,392,413.0	Mar-2009	5,625.4	86,326,487.3	2,640.9	
Apr-2009	5,503.3	86,502,591.6	Apr-2009	5,719.3	86,575,431.3	Apr-2009	5,503.3	86,502,591.6	2,645.7	
May-2009	5,387.6	86,669,607.5	May-2009	5,610.9	86,749,368.6	May-2009	5,387.6	86,669,607.5	2,648.6	
Jun-2009	5,270.7	86,838,268.5	Jun-2009	5,501.1	86,925,404.8	Jun-2009	5,270.7	86,838,268.5	2,649.7	
Jul-2009	5,159.9	86,998,225.2	Jul-2009	5,396.8	87,092,706.5	Jul-2009	5,159.9	86,998,225.2	2,649.3	
Aug-2009	5,047.9	87,159,757.4	Aug-2009	5,291.3	87,262,027.0	Aug-2009	5,047.9	87,159,757.4	2,647.2	
Sep-2009	4,938.3	87,317,783.2	Sep-2009	5,187.8	87,428,035.6	Sep-2009	4,938.3	87,317,783.2	2,643.5	
Oct-2009	4,834.5	87,467,653.5	Oct-2009	5,089.4	87,585,807.2	Oct-2009	4,834.5	87,467,653.5	2,638.6	
Nov-2009	4,729.6	87,619,000.0	Nov-2009	4,989.9	87,745,482.6	Nov-2009	4,729.6	87,619,000.0	2,632.0	
Dec-2009	4,630.2	87,762,535.9	Dec-2009	4,895.2	87,897,235.2	Dec-2009	4,630.2	87,762,535.9	2,624.4	
Jan-2010	4,529.7	87,907,485.5	Jan-2010	4,799.5	88,050,819.1	Jan-2010	4,529.7	87,907,485.5	2,615.2	
Feb-2010	4,431.3	88,049,288.6	Feb-2010	4,705.6	88,201,398.8	Feb-2010	4,431.3	88,049,288.6	2,604.7	
Mar-2010	4,344.4	88,175,275.4	Mar-2010	4,622.1	88,335,438.3	Mar-2010	4,344.4	88,175,275.4	2,594.5	
Apr-2010	4,250.1	88,311,277.4	Apr-2010	4,531.6	88,480,450.9	Apr-2010	4,250.1	88,311,277.4	2,581.8	

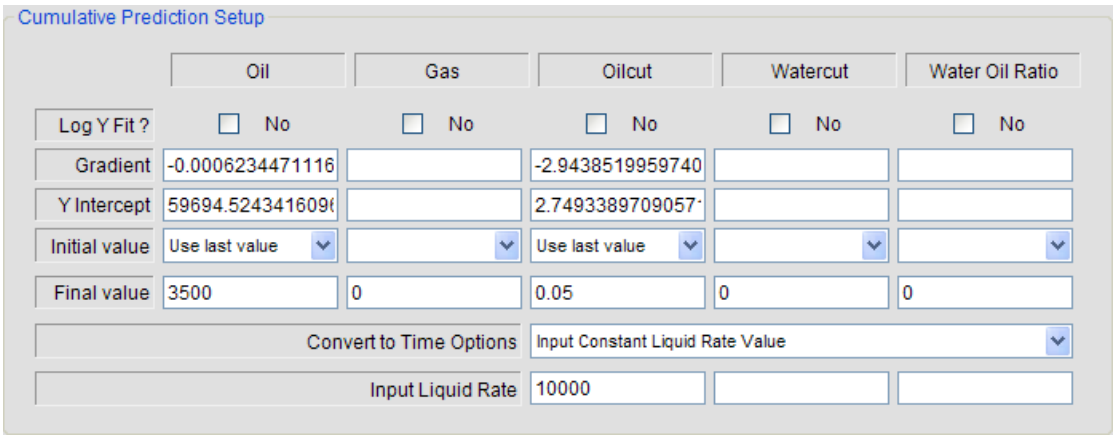
Constant Liquid Rate Prediction

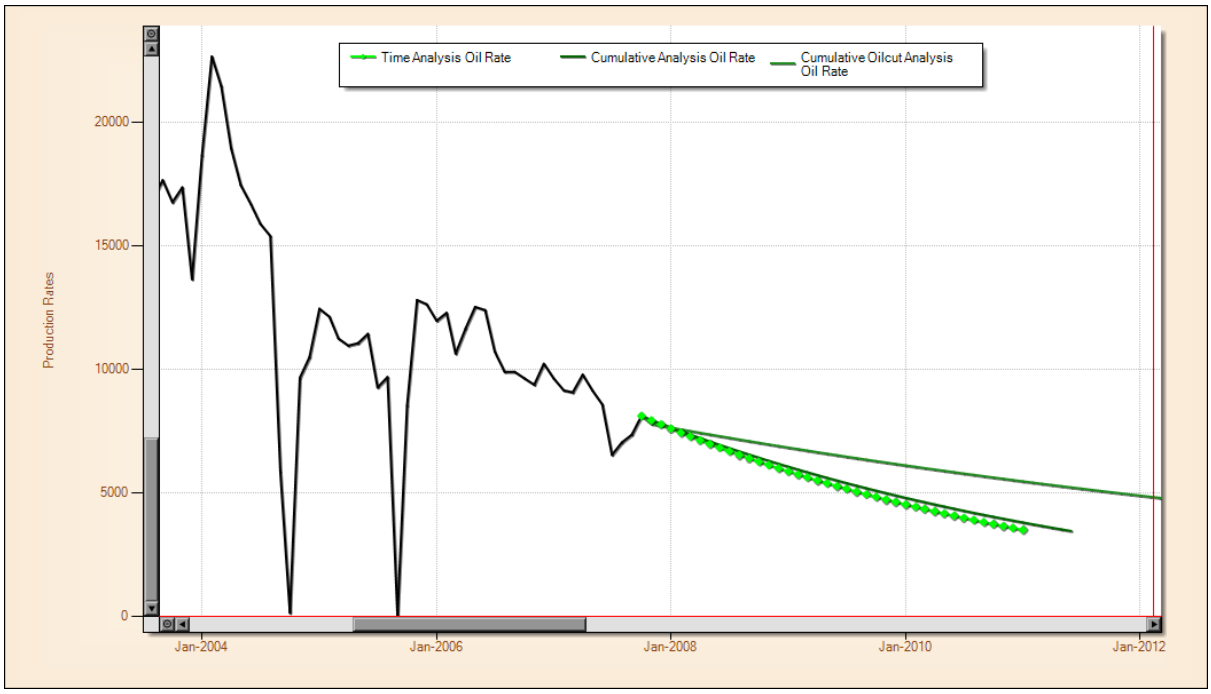
As discussed above, the user can choose to forecast the oilcut, watercut or water oil ratio prediction with time assuming a constant liquid rate. This is illustrated with the example below.

The user should select the **Input Constant Liquid Rate Value** from the **Convert to Time Options** dropdown list box, as shown below.



The user should then input a constant liquid rate value in the appropriate input box, as shown below. Then the user can press the **Calculate Predictions** button.





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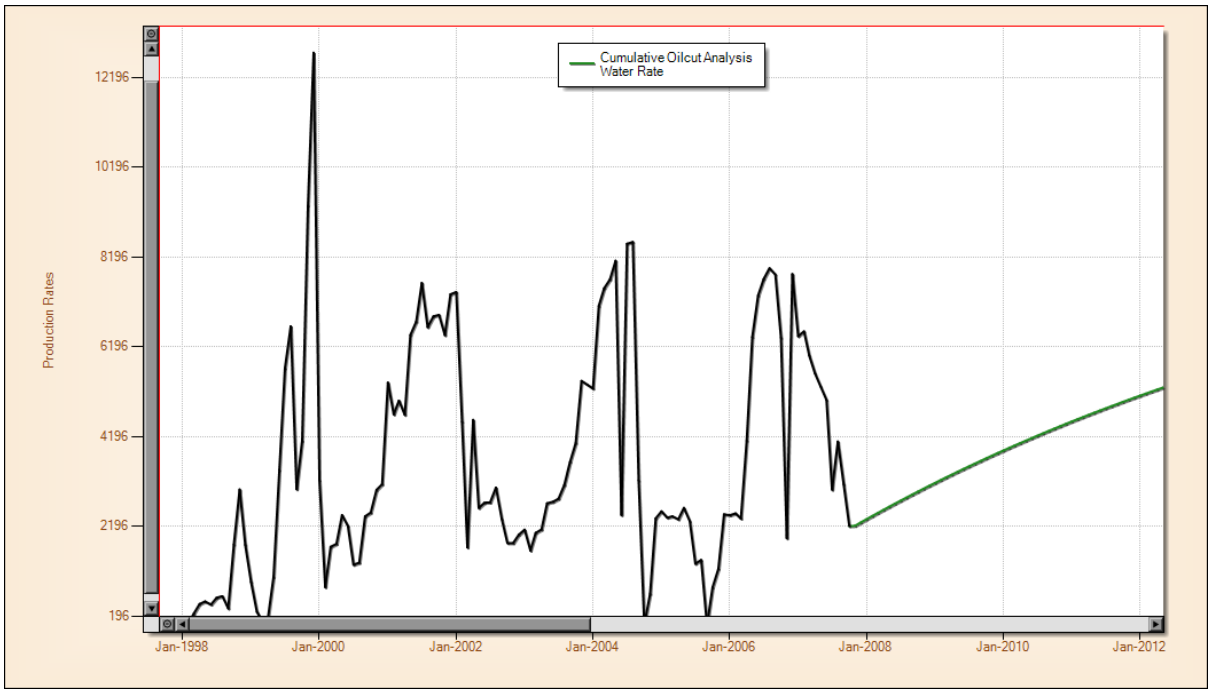


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