P2 Well Test 2.0
Flow Rate Coefficients
User's Guide

User's Guide

First Edition (April 2019)

This edition applies to Version 2.0 of P2 Well Test and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Preface

This guide provides users with information on how to use P2 Well Test.

This document outlines how to use P2 Well Test to generate the coefficients for a polynomial performance curve.

Who Should Read This Guide

This guide is intended for operators and engineers involved in the day to day tasks of analysing and forecasting well test data on-site. Typical users of P2 Well Test include Operator Technicians, Well Optimisation Engineers, Petroleum Engineers, and Operations Managers.

This guide assumes working knowledge of:

- Microsoft® Internet Explorer®
- Microsoft® Windows® operating systems

Related Documentation

Documents in the P2 Well Test technical documentation suite are:

Title	Description
P2 Well Test 2.0 Release Notes	Release Notes for the latest version of P2 Well Test.
P2 Well Test Installation Guide	Installing the Well Test and the Flow Rate Coefficients components of P2 Well Test and configuring P2 Well Test for first time use.
P2 Well Test Administrator's Guide	How to administer well profiles and well test attributes in the Well Test component of P2 Well Test.
P2 Well Test User's Guide	How to use the Well Test component of P2 Well Test to view and manage well tests.
P2 Well Test Flow Rate Coefficients User's Guide	How to use the Flow Rate Coefficients component of P2 Well Test to generate and analyse well performance curves.

These documents are available from P2 Customer Support.

Help and Support

P2 Customer Support provides a central point of contact for software assistance and the resolution of software issues. As part of this, P2 offers a variety of professional services, online resources, and access to experienced product specialists who are able to assist with your service requests. For support and information regarding our products, the following resources are provided:

FREE DOCUMENTATION RESOURCES

- PDF documentation supplied in the installation directory.

- Online help provided with the product (if supplied).

ONLINE SUPPORT PORTAL

The P2 Support Portal (http://p2energysolutions.com/support) provides access to online support, where you can raise service requests for P2 software, track defects, get product information, and communicate with P2 Customer Support.

CUSTOMER COMMUNITIES

P2's customer communities offer a networking environment for you and other P2 users. Our boards and user groups offer an informal setting to exchange information and discuss issues relevant to today's oil and gas companies. P2 is confident that together, we can create an interactive venue that will provide value by allowing our customers to communicate, collaborate and connect at multiple levels. For details, see www.p2energysolutions.com/services/customer-communities.

TRAINING

P2 offers a variety of standard and customised training courses (ranging from introductory courses through to administrator courses) to help you learn how to use P2 products.

CONTACT DETAILS

You can contact P2 Customer Support via phone or the Support Portal for technical support on any aspect of P2's products. Please also contact P2 Customer Support for further information on the Customer Communities, access to the online support portal, and information on available training courses. If you do not have a user account for the Support Portal, contact your internal support team or call the number below.

Phone:	1300 739 969 (Australia only)
	+61 8 9241 0314 (outside Australia)
Support Portal:	https://support.p2energysolutions.com

Introduction

In the oil & gas industry, theoretical production potential of individual wells is estimated from a performance curve for each well. Performance curves allow production to be inferred from the current tubing head pressure (THP) of a well.

The Flow Rate Coefficients component of P2 Well Test provides a solution to generate the coefficients for a polynomial performance curve. Once the coefficients are generated, they can be used during the production allocation calculations. For instance, they are stored as *calculation tags* in P2 Server. Such a calculation tag can then be run at any given time.

System Overview

P2 Well Test consists of two components: Well Test, and Flow Rate Coefficients.

Note: This document covers only the topics related to the Flow Rate Coefficients component. Refer to P2 Well Test User's Guide for the topics related to the Well Test component.

The Flow Rate Coefficients component of P2 Well Test provides the performance curve analysis functionality to P2 Explorer. It is a web-based application, and it can be easily accessed by users with the correct authentication and network access, using Microsoft Internet Explorer from any computer.

Flow Rate Coefficients complements P2 Explorer by providing the functionality to generate and view best-fit polynomial performance curves for a set of well test results, and to view and adjust their associated polynomial coefficients.

Benefits

- Provides accurate estimates of well production based on real-time data available from a data historian.
- Delivers a simple methodology to enable well curves to be kept up-to-date.
- Enables seamless integration with the P2 product suite.

Using Flow Rate Coefficients

The Flow Rate Coefficients of P2 Well Test is a web-based application. It can be easily accessed by users with the correct authentication and network access, using Microsoft Internet Explorer from any computer.

A typical Flow Rate Coefficients operational workflow goes like this:

The user creates sets of well test results in Well Test. Using the Well Test web service, Flow Rate Coefficients is able to access that data.

In the Coefficients Overview page (see page 10) of Flow Rate Coefficients, the user selects a well for which the performance curve should be generated, and opens the Coefficients Generator page (see page 20). This page lets the user select relevant well test results, include additional data points, and generate the polynomial performance curve. If required, the coefficients can be adjusted to create a curve that fits data points more accurately.

When the coefficients of a performance curve for a well are saved, other applications, such as P2 Server, can utilize them for production allocation processing.

Getting Started

Before you start you will need:

User name and password
> Normally this will be your standard network login. Check with your System Administrator if you are unsure.

Web address (URL) for accessing the Flow Rate Coefficients component of P2 Well Test
> Available from your System Administrator.

Internet Explorer and access to the corporate intranet
> Required to access the Flow Rate Coefficients web interface.

Launching Flow Rate Coefficients

Flow Rate Coefficients does not provide a home page as it is often integrated with P2 Explorer.

To launch Flow Rate Coefficients and log in:

1. Open a new window in Internet Explorer (click **Start > Programs > Internet Explorer**).

2. In the address bar, type the URL of P2 Explorer supplied by your System Administrator. It will be something like:

    http://localhost/babelfish

    Click on any links required to access Flow Rate Coefficients, as directed by your System Administrator. The link to Flow Rate Coefficients is usually available via P2 Explorer or on your corporate intranet.

3. When prompted to do so, enter your user name and password, and then click the **Login** button.

If the login is unsuccessful, you can attempt to log in again, or contact your System Administrator if you have forgotten your login details.

4.   On the P2 Explorer menu, Navigate to **Well Test**, and select a page from the menu .

For example, select the Coefficients Overview page (see page 10).

The available options will depend on your local configuration.

You may now start using Flow Rate Coefficients.

It is also possible to open a particular page directly.
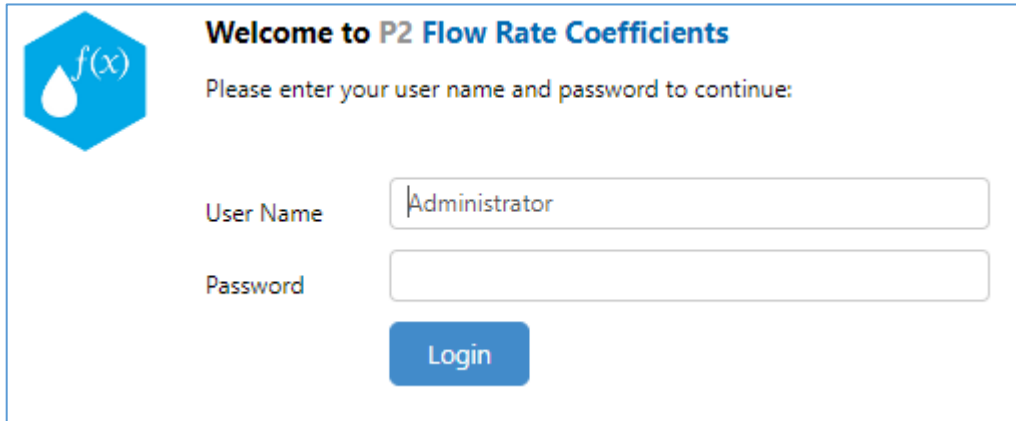
To launch Flow Rate Coefficients and log in:

1.   Open a new window in Internet Explorer (click **Start > Programs > Internet Explorer**).

2.   In the address bar, type the URL supplied by your System Administrator. It will be something like:
http://<server name>/flowratecoefficients/Pages/CoefficientsOverview.aspx

Click any links required to access Flow Rate Coefficients, as directed by your System Administrator. The link to Flow Rate Coefficients is usually available via P2 Explorer or on your corporate intranet.

3.   When prompted to do so, enter your user name and password, and then click the **Login** button.

On successful login, you are directed to the requested page.

If the login is unsuccessful, an error message appears. You can attempt to log in again, or contact your System Administrator if you have forgotten your login details.

Changing Your Password

Your System Administrator controls all user names and passwords. If you need to change your password, contact your System Administrator.

Logging Out

▸   To log out, click **Logout** on the Flow Rate Coefficients toolbar.

Overview of the Interface

Flow Rate Coefficients is highly configurable, and the available fields, pages, and menu options will depend heavily on how your local configuration is structured.

The main functionalities of Flow Rate Coefficients are present across the following pages:

- Coefficients Overview (see page 10)
  Shows an overview of wells and their coefficient factors.

- Flow Rate Coefficients (see page 16)
  Shows an overview of historical coefficients recorded in the system.

- Coefficient Generator (see page 20)
  Shows all details regarding best-fit polynomial curves and their coefficients for a well.

Note: Access to these pages depends on your security permissions.

Flow Rate Coefficients also uses the following common controls:

- Data Grid (see page 7)

- Date/Time Picker (see page 8)

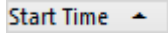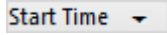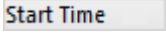## Data Grid

Flow Rate Coefficients uses data grids to display data in a tabular format. When appropriate, the grid will not load all available data and instead will divide it into separate *pages*. The status bar indicates how many rows were loaded and how many are still available.

▸ To view more paged data, scroll down or click the **Load more data** ⬇ button at the lower right side of the grid.

SORTING DATA IN THE GRID

You can sort the data in the grid by clicking a column header. There are three ways to sort data: *Ascending*, *Descending*, and *None*.

- Clicking a column header once sorts the data in ascending order.
  This is indicated by an arrow pointing upwards: Start Time ▲

- Clicking a column header a second time sorts the data in descending order.
  This is indicated by an arrow pointing downwards: Start Time ▼

- Clicking a column header a third time returns the order to its original state.
  No arrow appears in the column header: Start Time

EXPORTING DATA FROM THE GRID

Flow Rate Coefficients allows you to export the Data Grid to Microsoft® Excel.

1.   In the Status Bar, click the **Export** 🖥 button.
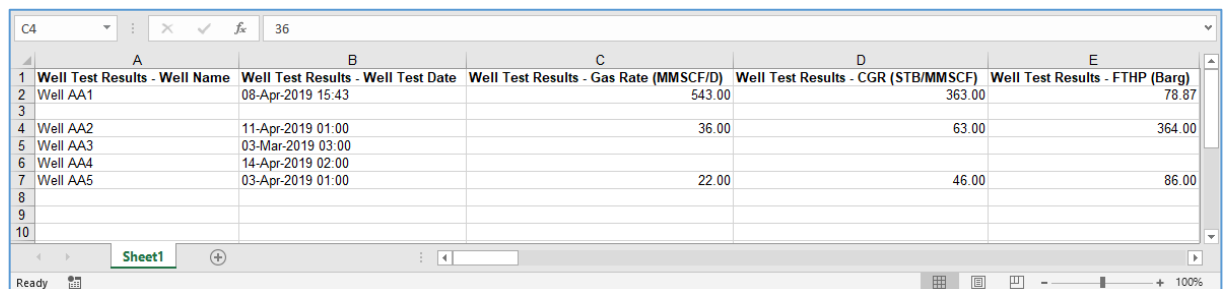
      The file download prompt appears.

2.   Click **Open** or **Save**, as appropriate.

      If you select **Open**, the Data Grid opens immediately in Excel.

      If you select **Save**, the file is saved as a *.xls* file.

Date/Time Picker

The date/time picker is used to select the date and time.

Fields that require a date or time to be entered are displayed with a button ⊞ ⏰ that opens the date and time picker when it is clicked.

Flow Rate Coefficients Overview

The main functionalities of Flow Rate Coefficients are presented across the three pages accessible from the P2 Explorer menu.

- Coefficients Overview (see page 10)
- Flow Rate Coefficients (see page 16)
- Coefficients Generator (see page 20)

Coefficients Overview

The **Coefficients Overview** page is used by reservoir engineers to configure coefficients, and other factors, for multiple wells at one time. The grid displays a row for each well and, where available, each row includes well test results and coefficient factors.

The Coefficients Overview page has five main sections:

① Header
The banner that identifies the page and provides access to online help.

② Filter
Supplies a selection of drop-down lists that allow you to filter the items in the table.

③ Results table
The table that displays results from well tests, gas rate factors, CGR factors, and other items of interest. The results table is quite wide and you will likely need to scroll horizontally to view all the entries.

④ Status bar
Identifies the state of the software and provides additional process functionality.

⑤ Footer
Provides additional functionality to select the date and time for the coefficients to take effect, and to save changes.

Results Table

The results table is quite detailed and contains a lot of information.

Well Test Results

The Well Test Results table displays the results of the well tests, as derived from the Well Test component of P2 Well Test.

The columns in the Well Test Results table display the following information:

Column Name	Description
Well Name	The name of the well as defined in the Well Hierarchy.
Well Test Date	The date of the last valid well test, defined in Well Test. This must be provided for all well tests and the format must be in dd/MMM/yyyy HH24:mm.
Gas Rate (MMSCF/D)	Last valid well test Gas Rate value, defined in Well Test. This is a number with two decimal places.
CGR (STB/MMSCF)	Last valid well test CGR value, defined in Well Test. This is a number with two decimal places.
FTHP (Barg)	Last valid well test FTHP value, defined in Well Test. This is a number with two decimal places.
Pr (Barg)	Last recorded shut in THP, defined in Well Test. This is a number with two decimal places.
WGR (STB/MMSCF)	Last valid well test WGR value, defined in Well Test. This is a number with two decimal places.
Sand Rate (g/Sec)	Last valid well test Sand Rate value, defined in Well Test. This is a number with two decimal places.

Effective Date

The **Effective Date** column lies between the Well Test Results and the Gas Rate Factors tables, and displays the effective date of the current loaded coefficients. It appears in in dd-MMM-yyyy HH24:mm format and defaults to the last known coefficients effective date.

Effective Date
16-Apr-2019 11:44
11-Apr-2019 01:00

Gas Rate Factors

Gas Rate Factors are generated by Flow Rate Coefficients to estimate a well's flow rate in relation to a well's THP; in this case, the Gas Flow Rate (if you are measuring Oil Flow Rate, Flow Rate Coefficients will show Oil Rate Factors instead).

The relationship between flow rate, THP and the gas rate factors is measured using the following formula:

Estimated Oil/Gas Flow Rate = Factor A * THP2 + Factor B * THP + Factor C

These factors are generated by Flow Rate Coefficients based on well test results from the Well Test component, using the line of best fit regression method to retrieve the 2nd order polynomial factors.

Gas Rate Factors		
Factor A	**Factor B**	**Factor C**
53.500000	-2460.000000	28247.000000
-0.002390	0.970602	-0.579093

The columns in the Gas Rate Factors table display the following information:

Column Name	Description
Factor A	Gas Rate Factor A defaults to the last known value of Gas Rate Factor A. This is a number with six decimal places.
Factor B	Gas Rate Factor B defaults to the last known value of Gas Rate Factor B. This is a number with six decimal places.
Factor C	Gas Rate Factor C defaults to the last known value of Gas Rate Factor C. This is a number with six decimal places.

CGR Factors

CGR refers to the Condensate/Gas Ratio, and is similar to the Gas Rate Factor except that it represents the relationship between CGR rate and a well's THP.

The relationship between CGR, THP, and the gas rate factors is measured using the following formula:

GCR = Factor A * THP2 + Factor B * THP + Factor C

These factors are generated by Flow Rate Coefficients based on well test results from the Well Test component using the line of best fit regression method to retrieve the 2nd order polynomial factors.

CGR is then be used to calculate a well's Condensate Rate in relation to a Well Gas Rate, using the following formula:

Estimated Condensate Flow Rate = CGR * Gas Rate

CGR Factors		
Factor A	**Factor B**	**Factor C**
0.146348	-12.126938	281.166178
-0.001786	0.780852	15.477921

The columns in the CGR Factors table display the following information:

Column Name	Description
Factor A	CGR Factor A defaults to the last known value of CGR Factor A. This is a number with six decimal places.
Factor B	CGR Factor B defaults to the last known value of CGR Factor B. This is a number with six decimal places.
Factor C	CGR Factor C defaults to the last known value of CGR Factor C. This is a number with six decimal places.

Others

There are a number of other columns in the results table.

Column Name	Description
Manual WGR (STB/MMSCF)	The WGR value defaults to the Well Test WGR value or a manually overridden value if it exists. This is a mandatory number with two decimal places.
Manual CO2 (%)	The CO2 value defaults to the Well Test CO2 value or a manually overridden value if it exists. This is a mandatory number with two decimal places.
Manual H2S (PPM)	The H2S value defaults to the Well Test H2S value or a manually overridden value if it exists. This is a mandatory number.
Manual Sand Rate (g/sec)	The Sand Rate value defaults to the Well Test Sand Rate value or a manually overridden value if it exists. This is a mandatory number with two decimal places.
Comments	This entry box is for notes regarding the row item. You can enter up to 1000 characters.
Last Recorded Time	The last known recorded time for the coefficients, in dd/MMM/yyyy HH24:mm format.
Last Recorded User	The user name of the person who last recorded the coefficients.
Update LKV	If this check box is selected, the last known coefficients and test values will be overridden by current value. If no last known coefficients and test values are found, it will use the time specified in the Effective Date text box.
Save	If this check box is selected, the coefficient will be updated for the row when the Save button is clicked.

Filtering the Grid

The Filter allows you to limit the rows displayed in the results table based on the dates, fields, platforms, and wells that you select.

	Well Test Results						
Well Name	Well Test Date	Gas Rate (MM···	CGR (STB/M···	FTHP (Barg)	Pr (Barg)	WGR (STB/M···	Sand Rate (g/···	Effective Date
> Well AA1	08-Apr-2019 15:...	543.00	363.00	78.87		346.00	11.94 16-Apr-2019 11:...
Well AA2	11-Apr-2019 01:...	36.00	63.00	364.00		4.00	34.00 11-Apr-2019 01:...

Last Known Value From 16/04/2019 6:56 PM   Field Center A ▼   Platform Platform AAA ▼   Well All ▼   Filter

To filter the grid:

1.   Select the filter options from the drop-down lists.

       The following filter options are available:

       Last Known Value From
       Filters the grid by only including a row for each well that is defined as an oil or gas producer in P2 Server at the specified time. If available, the last known (at the specified time) well test results and coefficients factors are displayed for each well. The default value is the current time.

       Field
       Filters the grid by only including platforms which belong to the selected field. The default value is All fields.

       Platform
       Filters the grid by only including wells which belong to the selected platform. The default value is All platforms.

       Well
       Filters the grid to only include the selected well. The default value is All wells.

2.   Click the **Filter** button.

Updating Multiple Rows

You can edit and save multiple coefficient generation rows in the grid simultaneously.

1. For each row that you want to save, select the check box in the **Save** column.

2. Where required, edit the fields and add a comment.

3. For each row, you can update the last known coefficient generation for the well, by selecting the **Update LKV** check box. If you select this check box, the **Effective Date** will be ignored.

   Note: If you do not select **Update LKV** and the well already has coefficients generated at the specified effective date, the existing entries (coefficient factors, selected well tests, and so on) for that well's coefficient generation will be overwritten. If the well does not have an existing coefficient generation at the specified effective date, new values will be created.

4.   Next to the **Effective Date** box, click the calendar icon, and choose a date and time for the coefficients to take effect.

5.   When you are ready to save, click **Save**.

6.   At the confirmation message, click **Yes**.

> **Note**: All rows are validated first. Only if all rows are successfully validated, are they then saved. If there is an error, it is displayed in the grid and the process stops. To view detailed information on any errors, hover over the invalid cell, which is marked by an error 🛇 icon.

Manual WGR ⋯	Manual CO2 (⋯	Manual H2S (⋯	Manual Sand ⋯
4.00	5.00	6	
4.00	This field is mandatory.		
2.00	The minimum value for this field is '0'.		
	The maximum value for this field is '1000'.		

7.   Resolve any errors, and then click **Save** again.

After you have successfully validated all rows, they are saved, and a confirmation message appears.

8.   Click **OK**.

Viewing Coefficient Generation Details

▸   Double-click on a row in the grid to load the **Coefficients Generator** page and view the details of the selected row.

Flow Rate Coefficients

On the **Flow Rate Coefficients** page, you can view a list of historical coefficients recorded in the system. You can also create new coefficients and edit existing ones.

The Flow Rate Coefficients page has five main sections:

① Header

The banner that identifies the page and provides access to online help.

② Filter

Supplies a selection of drop-down lists that allow you to filter the items in the table.

③ Function Buttons

Allows you to create, modify, and remove coefficients.

④ Results table

The table that displays results from well tests, gas rate factors, CGR factors, and other items of interest. The results table is quite wide and you will likely need to scroll horizontally to view all the entries.

⑤ Status bar

Identifies the state of the software and provides additional process functionality.

Results Table

The results table is quite detailed and contains a lot of information. The columns display the following information:

Column Name	Description
Well Name	The name of the well, as defined in the Well List. The well list is defined as part of the Well Hierarchy.
Effective Date	The effective date of the coefficients generation, in dd-MMM-yyyy HH24:mm format.
Gas Rate Factor A	Gas Rate Factor A, as defined in Flow Rate Coefficients. This is a number with six decimal places.
Gas Rate Factor B	Gas Rate Factor B, as defined in Flow Rate Coefficients. This is a number with six decimal places.
Gas Rate Factor C	Gas Rate Factor C, as defined in Flow Rate Coefficients. This is a number with six decimal places.
CGR Factor A	CGR Factor A, as defined in Flow Rate Coefficients. This is a number with six decimal places.
CGR Factor B	CGR Factor B, as defined in Flow Rate Coefficients. This is a number with six decimal places.
CGR Factor C	CGR Factor C, as defined in Flow Rate Coefficients. This is a number with six decimal places.
WGR (STB/MMSCF)	Last valid well test WGR value, as defined in Well Test. This is a number with two decimal places.
Sand Rate (g/Sec)	Last valid well test Sand Rate value, as defined in Well Test. This is a number with two decimal places.
Comments	This entry box is for notes regarding the row item. You can enter up to 1000 characters.
Last Recorded Time	The last known recorded time for the coefficients, in `dd-MMM-yyyy HH24:mm` format
Last Recorded User	The user name of the person who last recorded the coefficients

Filtering the Grid

The Filter allows you to limit the rows displayed in the results table based on the dates, fields, platforms, and wells that you select.

To filter the grid:

1.   Select the filter options from the drop-down lists.

     The following filter options are available:

     Start Date and End Date
     These fields filter the grid by only including a row for each well that has coefficients between the two dates.

     Field
     Filters the grid by only including platforms which belong to the selected field. The default value is All fields.

Platform

Filters the grid by only including wells which belong to the selected platform. The default value is All platforms.

Well

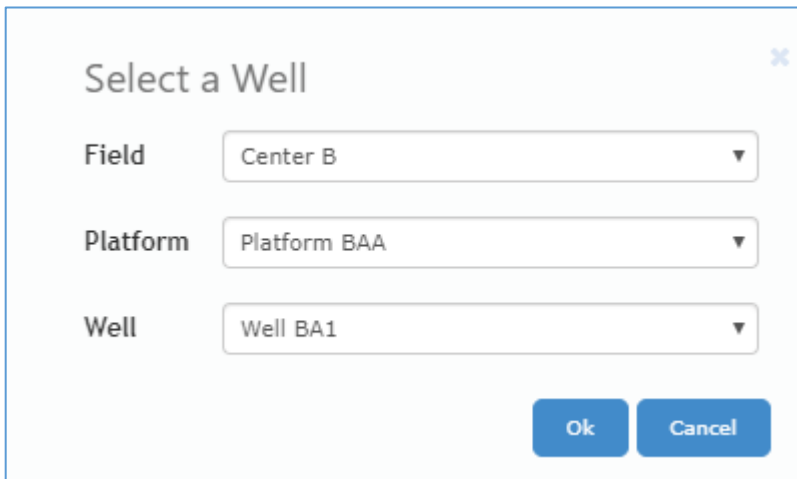Filters the grid to only include the selected well. The default value is All wells.

2.   Click the **Filter** 🔽 button.

Creating Coefficients

To create new coefficients for a well:

1.   Click **New** ⊕.

The well selection dialog window opens.

2.   Select the field, platform, and well from the drop-down lists that appear.

3.   Click **OK**.

The **Coefficients Generator** page opens.

Editing Coefficients

You can edit existing coefficients for a well in two ways:

- Double-click a row in the grid

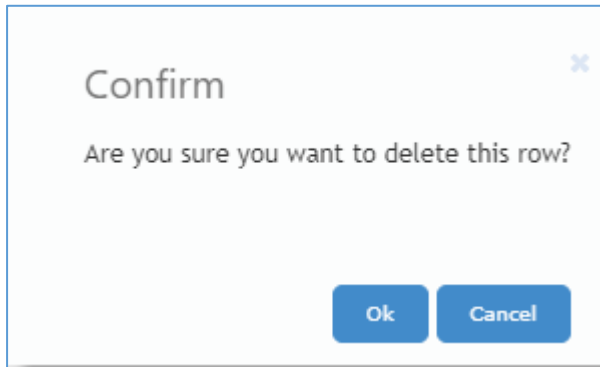- Click a row in the grid to select it, and then click **Edit** 🖊.

The **Coefficients Generation** page opens for editing.

Deleting Coefficients

To delete existing coefficients for a well:

1.   Click a row in the grid to select it.

2.   Click the **Delete** 🗑 button.

3.   At the confirmation message, click **OK**.


Coefficients Generator

The **Coefficients Generator** page is used to generate coefficient factors for oil rate. The page also provides a single chart: **Gas Rate vs. THP**, which uses the generated factors to display the lines of best fit curve.

▸   To access the page from either the **Coefficients Overview** page or the **Flow Rate Coefficients** page, double-click a row in the data grid.

The Coefficients Generator page has five main sections:
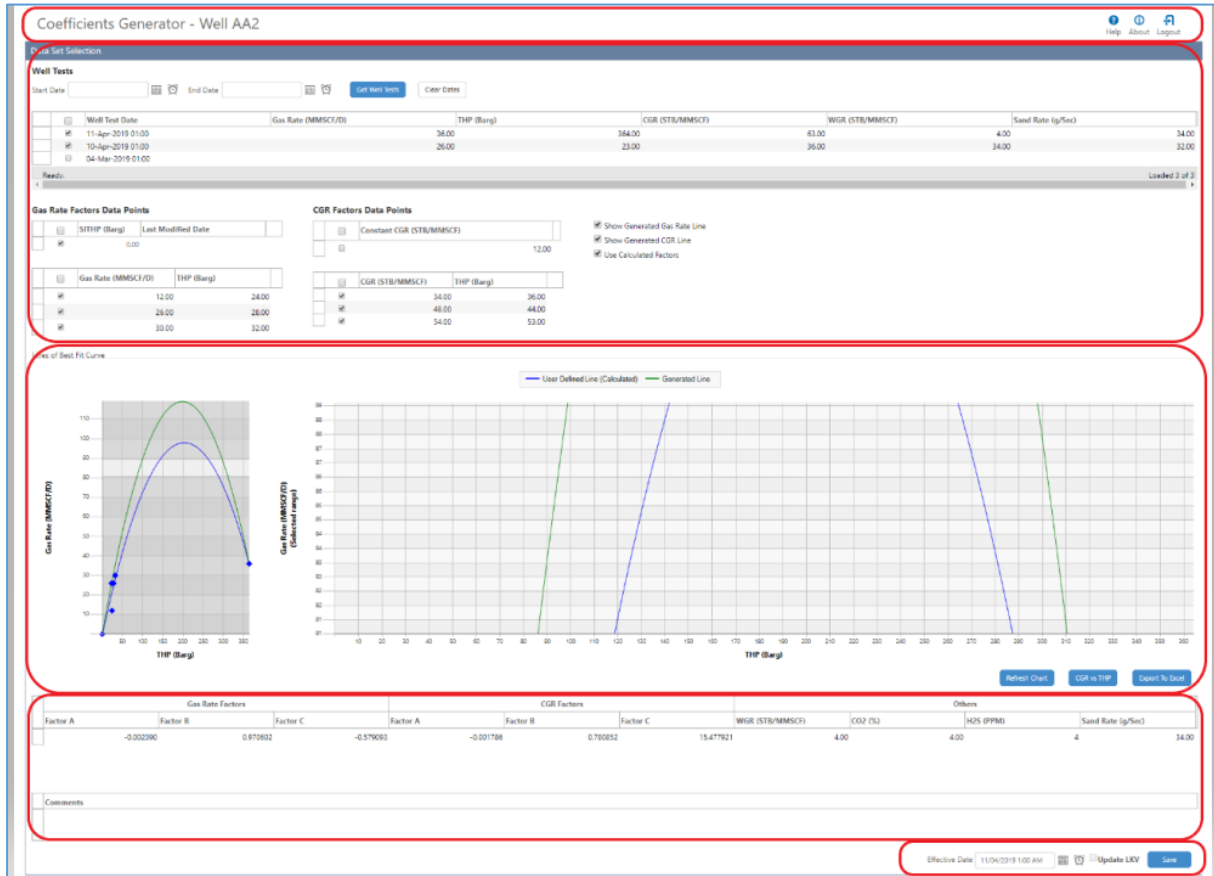
① Header

The banner that identifies the page and the well, and provides access to online help.

② Well Tests

Supplies the detailed results of the well tests for that well.

③ Lines of Best Fit Curve

Displays the line of best fit curve for either **Gas Rate vs THP** or **CGR vs THP**.

④ Factors Grid

Presents the Gas Rate Factors, CGR Factors, and other values taken from the Data Grid.

⑤ Footer

Provides additional functionality to select the date and time for the coefficients to take effect, and to save changes.

Well Tests

The Well Tests section provides the data points for the coefficients, and has four main parts:

Date Selection

Select the start and end dates for which you want to filter the well test results for that well. Click **Get Well Tests** to retrieve the results. This data populates the rest of the page.

Well Test Data

Table listing the well test results from the filter selection. Select the check box to save manual overridden data and data points for generating the curve.

Data Points

The entry fields in the Data Points section allow you to manually specify additional points for gas rate or CGR, to use in the regression. A maximum of three data points can be added. You can also specify a constant CGR value to use for the coefficients.

Parameters of Calculation Modules

Populate parameters specific to the calculation module in use. This section might differ or remain hidden, depending on the configuration of the application.

Chart Configuration

You can choose whether to show the generated Gas Rate or CGR lines in the graph. You can also configure the chart to display the line based on the calculated factors together with the line based on the manually entered coefficients.

Line of Best Fit Curve

The Line of Best Fit Curve displays a chart representing the **Gas Rate vs. THP** or **CGR vs. THP** coefficients, using the selected data set, with a line of best fit as calculated by least squares regression. By default, the **Gas Rate vs. THP** graph is initially displayed.

If two data points are selected, a linear equation is used instead. If three or more data points are selected, a 2nd-order polynomial equation is used.
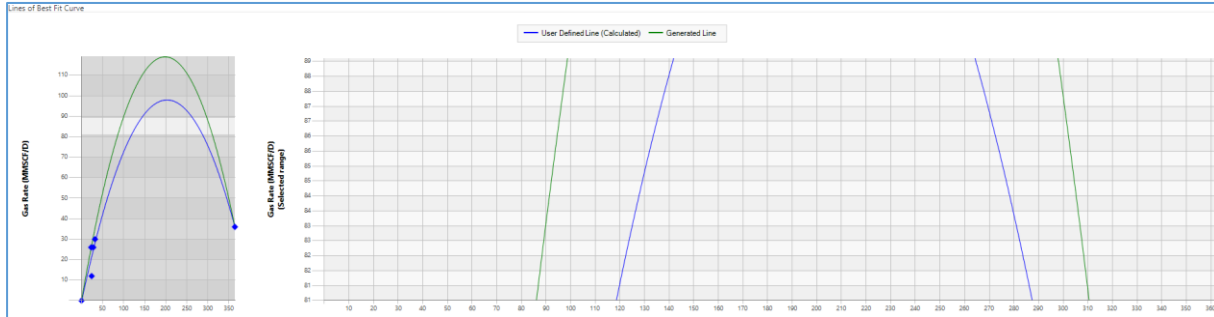
▸   To redraw the curves using the current coefficient values, click the **Refresh Chart** button located at the lower right of the chart.

▸   To switch between the **CGR vs. THP** and **Gas Rate vs. THP** views, click the corresponding button.

▸   To download a spreadsheet with the chart, associated well tests information, and data points, click the **Export to Excel** button.

The chart component also offers interactive behavior:

▸   To display an enlarged area of the chart, click and drag the mouse cursor vertically. Click again to return to the default view.

▸   To display the information about the nearest point on a curve, click the chart while pressing the **CTRL** key. Hold the **CTRL** key and drag the mouse cursor vertically to remove selection.

Factors Grid

The Factors Grid appears below the Line of Best Fit Curve graph, and displays the generated Gas Rate Factors and CGR Factors, using the selected data set.

The columns in the grid are as follows:

Column Name	Description
Gas Rate Factors	
Factor A	Calculated Gas Rate Factor A from the selected dataset. If two data points are selected, factor A will be 0. This is a number to 6 decimal places. This factor can be manually overridden by a user.
Factor B	Calculated Factor B from the selected dataset. This is a number to 6 decimal places. This factor can be manually overridden by a user.

Column Name	Description
Factor C	Calculated Factor C from the selected dataset. This is a number to 6 decimal places. This factor can be manually overridden by a user.
CGR Factors	
Factor A	Calculated Factor A from the selected dataset. If two data points or *Constant CGR* value are selected, factor A will be 0. This is a number to 6 decimal places.
Factor B	Calculated Factor B from the selected dataset. If *Constant CGR* value is selected, factor B will be 0. This is a number to 6 decimal places.
Factor C	Calculated Factor C from user's selected dataset. This is a number to 6 decimal places.
Others	
WGR (STB/MMSCF)	Sourced from the latest well test result of the selected dataset. This is a number to 2 decimal places. This factor can be manually overridden by a user.
CO2 (%)	CO2 value. This is a number to 2 decimal places. This factor can be manually overridden by a user.
H2S (PPM)	H2S value. This factor can be manually overridden by a user.
Sand Rate (g/Sec)	Sourced from the latest well test result of the selected dataset. This is a number to 2 decimal places. This factor can be manually overridden by a user.
Comments	
Comments	This entry box is for notes regarding the generated coefficients. You can enter up to 1000 characters.

Filtering the Well Tests

To filter the previous well tests:

1.   Select a **Start Date** and **End Date**.

2.   Click **Get Well Tests**.

To revert back to the last six well tests:

1.   Click **Clear Dates**.

2.   Click **Get Well Tests**.

Selecting Data Points

To generate coefficients, you must select at least two unique data points for both **Gas Rate** and **CGR** (for CGR you can select a single constant point instead).

A data point consists of an *x* value and a *y* value. THP is always the *x* value and Gas Rate and CGR are used for the *y* values. If you do not select any data points, a message appears prompting you to select the data points.

To generate coefficients, you must select at least two unique data points from the Well Tests section of the page. The data points may consist of two calculated well tests or one calculated well test and one user-defined CGR data point.

A data point consists of an **x** value and a **y** value. The **x** value is always THP and the **y** value can be either Gas Rate or CGR.

▸   To select a data point, select the check box for the relevant row.

The data points must also contain at least two *unique* THP values, otherwise a message appears.

Generating Coefficients

▸ After you have selected the data points, click **Refresh Chart** to update the currently displayed chart and coefficient factors.

The Lines of Best Fit Curve is generated using the formula $y = ax^2 + bx + c$ where **y** is the gas rate or CGR, and **x** is the THP for the well.

The chart contains up to four series:

Generated Line

The line of best fit based on the factors generated from the rows in the previous well tests grid (all rows are included regardless whether they are selected or not). For the Gas Rate vs. THP chart, the row in the SITHP grid is also included.

User Defined Line (Calculated)

The line of best fit based on the factors generated from the grid's selected rows. The points used to generate this line of best fit are also displayed.

User Defined Line (Manual)

The line of best fit based on the factors manually overwritten by the user.

Last Saved Line

The line of best fit for the well's previously saved coefficient factors (if applicable).

The Line of Best Fit Curve displays a graph showing the **Gas Rate vs THP** or **CGR vs THP** coefficients, using the selected data set. By default, the **Gas Rate vs THP** graph is initially displayed.

▸ You can toggle between the two charts by clicking the **CGR vs THP** or **Gas Rate vs THP** button below the chart.

The generated factors are shown in the grid below the chart:

Gas Rate Factors			CGR Factors		
Factor A	Factor B	Factor C	Factor A	Factor B	Factor C
-0.002390	0.970602	-0.579093	-0.001786	0.780852	15.477921

All the factors in the Gas Rate Factors section can be manually overridden.

▸ To display the User Defined Line (Manual), select the Use Calculated Factors option, available above the chart.

Saving Generated Coefficients

To save the generated coefficients:

1. Ensure you have selected data.

2. In the Factors Grid, add any further values (WGR, CO2, H2S and Sand Rate) and comments as required.

3. If you are creating new coefficients, you can select **Update LKV** to update the last known values for this well.

If this is selected, the last known coefficients and test values will be overridden by current value. If no last known coefficients and test values are found, it will use the time specified by **Effective Date**.

4.   Click **Save** 💾.

5.   At the confirmation message, click **OK**.
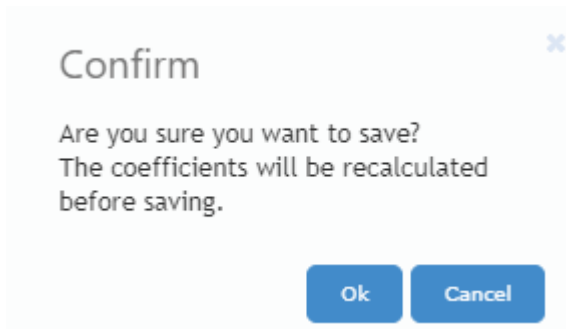
Before they are saved, the coefficients will be automatically recalculated and the data will be validated.

A message then appears, indicating if the save was successful or if there were any errors. If any errors occur, they are displayed in the grid and the coefficients are not saved.

To view detailed information on the error, hover over an invalid cell, which is marked by an error ❌ icon.

If errors occurred, correct them and then click **Save** again.

Well Tests Have Changed

It is possible that data in Well Test may have changed since the coefficients were last generated and saved. If this is the case, a message appears, highlighting in red the factors that changed after recalculating.

After you click **OK**, the *Factors* grid displays an additional row showing the saved factors that were generated using the previous well test values.

The previous coefficient factors will continue to be used until the page has been saved.