# *Drilling Planning to Reporting Workflows*



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[Installdir]\Documentation\Third_Party.pdf

# Contents

# Drilling Planning to Reporting Workflows

The Drilling Planning to Reporting Workflows begin in the PROFILE™, StressCheck™, or WELLPLAN™ applications and end using the OpenWells® application. In all of these workflows, drilling operation planning data is available to the OpenWells application after it was input using PROFILE, StressCheck, or WELLPLAN software.

Integrated Drilling applications are engineered to share a great amount of data input flexibility. The benefits of this flexibility outweigh the risk of data corruption if the applications are used incorrectly.

Landmark currently supports several Drilling to Reporting (OpenWells) workflows that are discussed further in this document. In the *Drilling Operations to Analysis Workflow*, supported Reporting to Drilling workflows include: Reporting Data input via the Daily Operations Report, Casing Report, or Kick Report in OpenWells is used by the WELLPLAN software to perform Torque and Drag, Hydraulics, Well Control, Cementing, etc., analysis.

## Symbols Used in the Workflows

This symbol indicates data input in one application is shared with another application.

This symbol indicates important steps in the integration process.

# Workflow A: Run a Planned Completion Assembly

## *Software Applications Needed*

- PROFILE™
- OpenWells®

## *Overview*

The Run a Planned Completion Assembly workflow demonstrates how casing and completion string data input into the PROFILE application is available for reporting in the OpenWells application.

This example workflow used in this section includes using the PROFILE and OpenWells software.

1. PROFILE Software: This workflow begins in the PROFILE application by defining the casing and completion assembly for a planned or prototype design.

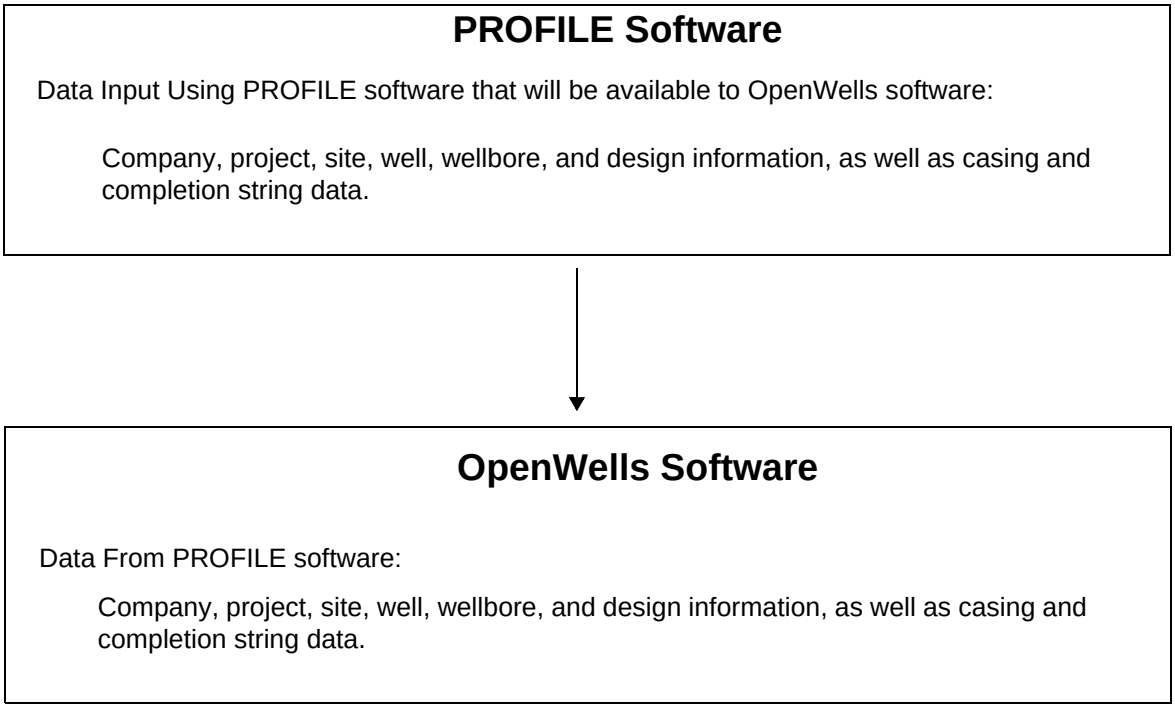
2. OpenWells Software: The casing and completion string data input using the PROFILE application is available to OpenWells software and is used on the Wellbore Equipment and Well Planning reports for an actual design.

3. PROFILE Software: You can then use the PROFILE software to review the casing and completion information from the OpenWells application.

**This workflow does not demonstrate all the functionality of the software.**

The intent of this workflow is to demonstrate integration between the applications and does not include all of the software's functionality. There are other possible ways the applications could be used together, as well as separately. Refer to the individual product's online help for more information.

## *Data Flow*




## *Workflow Steps*

### Input Data Using PROFILE Software

1. Launch the PROFILE software (**Start > Programs > Landmark Engineer's Desktop 5000.1 > PROFILE**) if it is not already active.

2. If the login screen appears, enter the appropriate User ID and Password.

3. Create a company, project, site, well, wellbore, and prototype or planned design if necessary.

4. Open an existing planned or prototype design, or the design you created. This design must be a prototype or planned design associated with the well and event you will be using in the OpenWells application.

### *Enter Casing Information*

5. Input casing information using the **Casing** tab.

### *Enter Wellbore Equipment and Assembly Information*

6. Input wellbore equipment and assembly information using the **Wellbore Equipment** tab.

7. Save your data and close the PROFILE application.

## Use Data Input in PROFILE for OpenWells Reports

8. Launch OpenWells (**Start > Programs > Landmark Engineer's Desktop 5000.1 > OpenWells**) if it is not already active.

9. If the login screen appears, enter the appropriate User ID and Password.

### *Create an Event*

10. Right-click on the desired well, then select **New Event** from the drop-down menu. The new event must be associated with the well that the planned or prototype design was associated with in the PROFILE application.

### *Create a Well Planning Report*

11. Right-click on the event, select **New Report** from the list, and then select **Well Planning**.

12. Select the design you input data for using the PROFILE application, and then click **Finish** to create the report. If you do not select the design you used in the PROFILE application, the data will not be displayed in the OpenWells application.

13. Review the **Casing Program** section of the report and notice that the data input in the PROFILE software is available to the OpenWells application.

14. Review the **Completion Strings** section of the report and notice that the data input in the PROFILE software is available to the OpenWells application.

### *Create a Wellbore Equipment Report*

15. Right-click on the event, select **New Report** from the list, and then select **Wellbore Equipment**.

16. To import the completion string input in the PROFILE software, click on the **Import Planned/Prototype String** button in the **General > Assembly Information** section of the **Wellbore Equipment** report. Select the desired string from the list.

17. Review the data that was input using the PROFILE software that is available to the actual design in the OpenWells application.

18. Save and close the report.

19. Close the OpenWells application.

## Review Data Using the PROFILE Software

20. Launch the PROFILE software (**Start > Programs > Landmark Engineer's Desktop 5000.1 > PROFILE**) if it is not already active.

21. Open the actual design that you imported the PROFILE data into. You can review the actual design casing and completion information (trajectory, hole section, casing, wellbore, stimulation, perforations, etc.) in the PROFILE software.

    If you make any changes to the data in the PROFILE application, you must make the changes to the planned or prototype design, and then import the altered PROFILE data into the OpenWells application.

# Workflow B: Planned to Actual Casing Scheme

## *Software Applications Needed*

- StressCheck™
- OpenWells®

## *Overview*

The Planned to Actual Casing Scheme workflow demonstrates how casing scheme data input and analyzed using the StressCheck software is available for reporting in the OpenWells application.

This example workflow used in this section includes using the StressCheck and OpenWells applications.

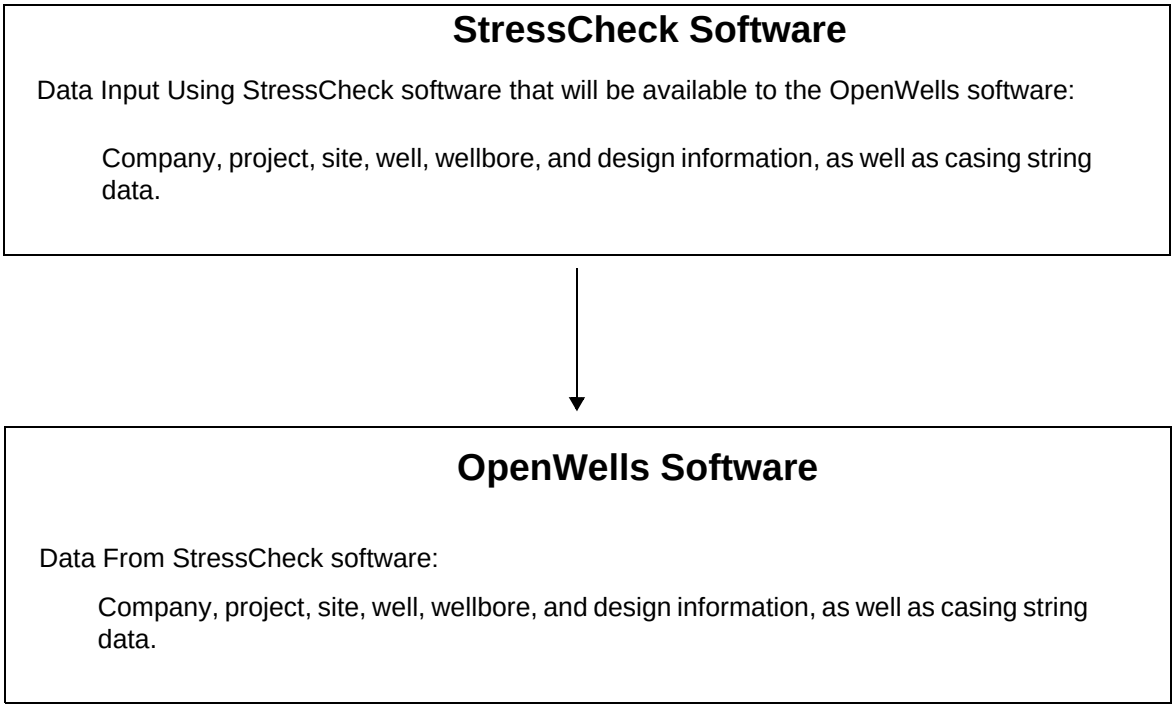
1. StressCheck Software: This workflow begins in the StressCheck application by defining and analyzing the casing string.

2. OpenWells Software: The casing string data input using the StressCheck software is available to the OpenWells application and is used on the Casing report.

**This workflow does not demonstrate all the functionality of the software.**

The intent of this workflow is to demonstrate integration between the applications and does not include all of the software's functionality. There are other possible ways the applications could be used together, as well as separately. Refer to the individual product's online help for more information.

## *Data Flow*




## *Workflow Steps*

### Input Data Using StressCheck Software

1. Launch the StressCheck application (**Start** > **Programs** > **Landmark Engineer's Desktop 5000.1** > **StressCheck**) if it is not already active.

2. If the login screen appears, enter the appropriate User ID and Password.

3. Create a company, project, site, well, wellbore, and design if necessary.

4. Open an existing design, or the design you created.

### *Input Wellbore Data*

5. Input data using the **Wellbore** menu options. The data input using the Wellbore menu will not be displayed on the OpenWells **Casing Report**, however this data is necessary for the StressCheck analysis and could be used in other OpenWells reports outside the scope of this workflow.

   a) Use the **Wellbore > General** dialog to specify general well information.

   b) Use the **Wellbore > Pore Pressure** spreadsheet to specify pore pressure data.

   c) Use the **Wellbore > Fracture Gradient** spreadsheet to specify fracture gradient data.

   d) Use the **Wellbore > Wellpath Editor** spreadsheet to specify the wellpath data.

   e) Use the **Wellbore > Production Data** dialog to input packer and reservoir data.

   f) Use the **Wellbore > Geothermal Gradient** dialog to input temperature data.

### *Input a Casing and Tubing Scheme*

6. Use the **Wellbore > Casing and Tubing Scheme** spreadsheet to input the casing and tubing configuration.

### *Input Design Parameters and Loads*

7. Use the **Tubular > Design Factors** dialog to specify design factors.

8. Use the **Tubular > Initial Conditions** tabs to specify cementing and landing, and temperature data describing the initial conditions.

9. Define the tool passage requirements using the **Tubular > Tool Passage** dialog.

10. Use the **Tubular** > **Minimum Cost** dialog to specify solution constraints.

11. Use the **Burst Loads**, **Collapse Loads**, **Axial Loads**, and **Custom Loads** dialogs to specify casing and tubing design loads. (All available using the **Tubular** menu.)

### *Specify String and Connection Data*

12. Use the **Tubular** > **String Sections** spreadsheet to specify additional casing information.

13. Use the **Tubular** > **Connections** spreadsheet to specify which connections you are using.

### *Check the Design*

14. Use **View** > **Design Plots** > **Triaxial Design to** perform graphical casing or tubing design based on triaxial stress analysis or to check the triaxial design of a string specified on the String Sections spreadsheet.

15. Save the design, and close the StressCheck application.

## Use Data Input in StressCheck Software for OpenWells Reports

16. Launch the OpenWells software (**Start** > **Programs** > **Landmark Engineer's Desktop 5000.1** > **OpenWells**) if it is not already active.

17. If the login screen appears, enter the appropriate User ID and Password.

### *Create an Event*

18. Right-click on the desired well, then select **New Event** from the drop-down menu.

### *Create a Casing Report*

19. Right-click on the event, select **New Report** from the list, and then select **Casing Report**.

20. Select the appropriate wellbore that has the StressCheck data and select the appropriate event.

21. To import the completion string input in the StressCheck software, click on the **Import Planned/Prototype String** button in the **General > Assembly Information** section of the **Casing** report. Select the desired string from the list. There may be what appears to be duplicate strings in the list. This will occur if the wellbore has multiple designs with the same string names. You many want to consider using unique string names for all strings within a wellbore.

22. Review the data that was input using the StressCheck software that is available to the OpenWells application.

23. Save and close the report.

# Workflow C1: Run Planned Drillstring Assembly

## *Software Applications Needed*

- WELLPLAN™
- OpenWells®

## *Overview*

The Run Planned Drillstring Assembly workflow demonstrates how drillstring data is input then analyzed using the WELLPLAN software and is available for reporting in the OpenWells application.

The example workflow used in this section includes using the WELLPLAN and OpenWells software.

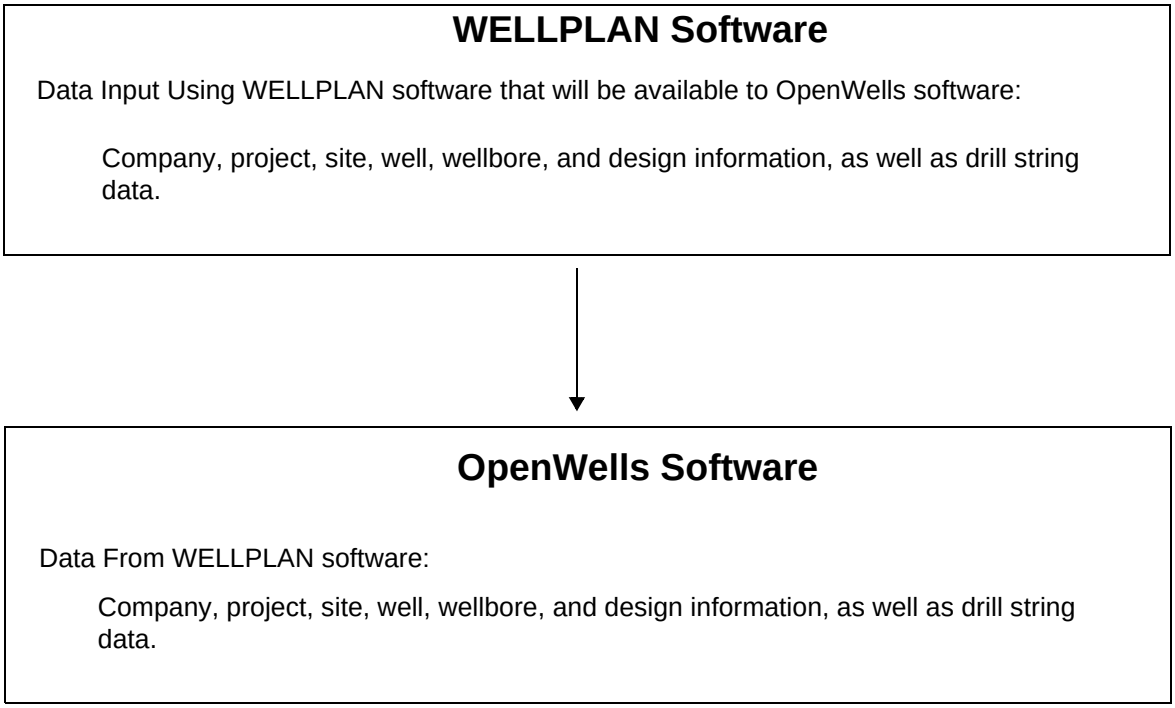
1. WELLPLAN Software: This workflow begins in the WELLPLAN application by defining a drillstring.

2. OpenWells Software: The drillstring data input using the WELLPLAN software is available to the OpenWells application and is used on the Daily report.

**This workflow does not demonstrate all the functionality of the software.**

The intent of this workflow is to demonstrate integration between the applications and does not include all of the software's functionality. There are other possible ways the applications could be used together, as well as separately. Refer to the individual product's online help for more information.

## *Data Flow*




## *Workflow Steps*

### Input Data Using WELLPLAN Software

1. Launch the WELLPLAN software (**Start > Programs > Landmark Engineer's Desktop 5000.1 > WELLPLAN**) if it is not already active.

2. If the login screen appears, enter the appropriate User ID and Password.

3. Create a company, project, site, well, wellbore, design, and case if necessary.

4. Open an existing case, or the case you created.

### *Input Drill String Data*

5. Use the **Case > String Editor** spreadsheet to define the drill string.

6. Save the case, and close the WELLPLAN application.

## Use Data Input in WELLPLAN Software for OpenWells Reports

7. Launch the OpenWells software (**Start > Programs > Landmark Engineer's Desktop 5000.1 > OpenWells**) if it is not already active.

8. If the login screen appears, enter the appropriate User ID and Password.

### *Create an Event*

9. Right-click on the desired well, then select **New Event** from the drop-down menu. Enter as much information as possible about the Event then click **OK**. The Event is created and displays in the Well Explorer beneath the Well.

### *Create a Daily Operations Report*

10. Right-click on the event, select **New Report** from the list, and then select **Daily Operations**. Be sure you have the correct wellbore and event selected on the **Create New Report Wizard** dialog.

11. Click **Next** then **Finished** to create the report.

12. In the **Drillstrings** section of the report, click the **Create New From Copy** button.

    a) Select the Well and Wellbore that has the WELLPLAN drillstring you want to use.

13. Review the string and all the components in the **Drillstrings** section of the **Daily Operations Report**.

# Workflow C2: Rig Sharing

## *Software Applications Needed*

- WELLPLAN™
- OpenWells®

## *Overview*

Rig Sharing can be thought of as the ability to share rig data, rig operations information, and rig equipment specifications, between drilling applications. The two scenarios below show how Rig Sharing could be used in a company:

- The Operator at the wellsite enters Rig data in the OpenWells software that is used by the Engineer for well planning. For example, the Operator surveys existing pumps at the wellsite and enters pump specifications into the OpenWells application. This data is now available to Project Management for use in the Daily Operations Report, or to the Engineer for use in well planning activities.

- The Engineer in the planning office enters Rig data in the OpenWells software or another application, such as WELLPLAN software. Through Rig Sharing, this data is now available to the Operator. For example, the Operator who creates an Event in OpenWells software could benefit from rig data entered by the Engineer.

The Rig Sharing workflow demonstrates how Rig data, in this case a Rig Operation, can be associated to an Event created in the OpenWells software. All rig data, such as operations or equipment, is shared in the Event and is available to OpenWells reporting.

Always pay close attention to date entries when creating Designs, Cases, Events, Rig Operations, etc. Incorrect or missing dates can result in the appearance of a mismatch between reports and data input.

The example workflow used in this section includes using the WELLPLAN and OpenWells applications.

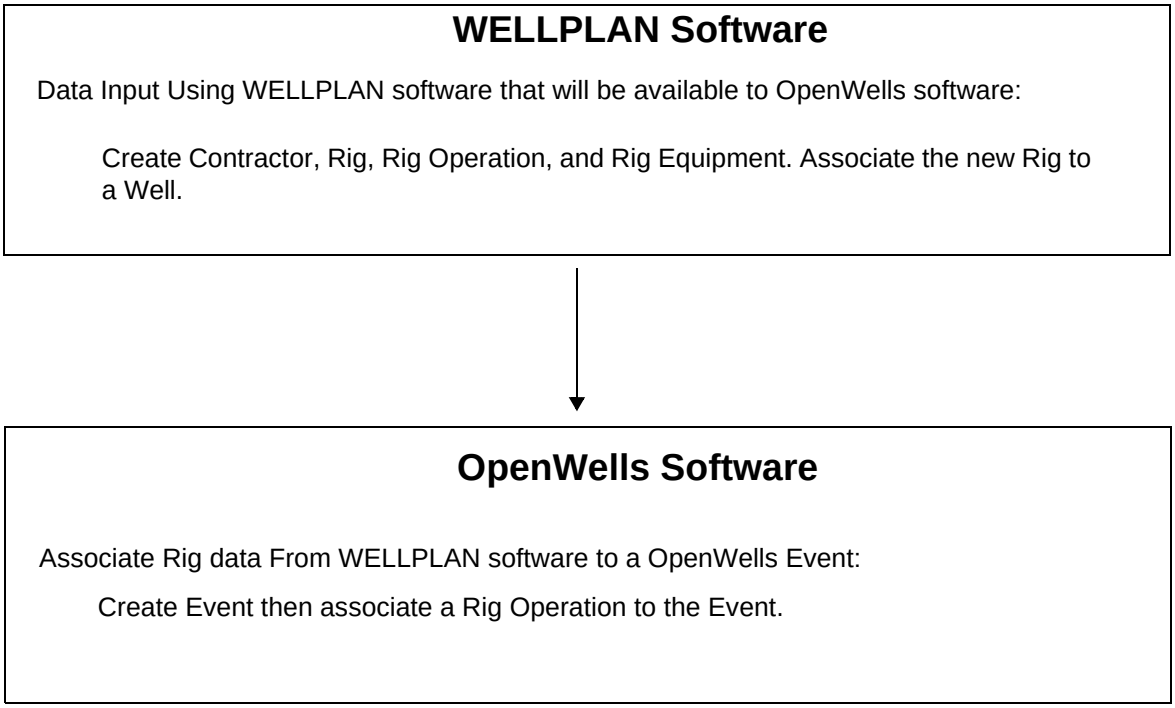
1. WELLPLAN software: This workflow begins in the WELLPLAN application by creating a Contractor, Rig, Rig Operation and Rig Equipment then associating the Rig to a Well.

2. OpenWells software: An Event is created and Rig data input using the WELLPLAN software is available to the OpenWells application. The example shows how to associate a Rig Operation to the Event.

**This workflow does not demonstrate all the functionality of the software.**

The intent of this workflow is to demonstrate integration between the applications and does not include all of the software's functionality. There are other possible ways the applications could be used together, as well as separately. Refer to the individual product's online help for more information.

## *Data Flow*




## *Workflow Steps*

### Input Data Using WELLPLAN

#### *Create a Contractor*

1. From the Well Explorer, right-click on the Contractors node and select **New Contractor** from the drop-down menu to open the Contractor Properties dialog.

2. Enter information as required. A contractor must have a unique name entered in the **Contractor** field. This field cannot be left blank.

3. Click **Apply** to save and continue adding data in the dialog. Click **OK** to close the dialog and add the new Contractor to the Well Explorer.

4. Click **Yes** when prompted to create a New Rig. The Rig Properties dialog displays.

### *Create a Rig*

5. From the Rig Properties dialog, enter as much information as possible about the rig. For further details about the specific fields and functions on each tab, see *WELLPLAN Help*.

6. When data entry is complete, click **OK**. The Rig and its associated Rig Equipment nodes are added to the Well Explorer.

7. Click **Yes** when prompted to create a New Rig Operation. The Rig Operation Properties dialog displays.

### *Create Rig Operation*

8. From the Rig Operation Properties dialog, enter as much information as possible about the rig operation. If data is unavailable at the time of creation, enter the data as it becomes available by updating the Rig Operation Properties dialog. Data must be entered in the Contract Reference field. This field cannot be left blank. Notice that the read-only Associated Wells/Events tab is blank. This tab will populate after the Rig Operation is associated to the OpenWells Event.

**Rig Operation Dates**

Do not enter dates in the Rig Operation Properties dialog at this time. The dates are added when the Rig Operation is associated to an Event in the OpenWells application. If dates are entered when the Rig Operation is created in WELLPLAN software, you cannot create an association to the Event in OpenWells software.

If a Rig Operation already exists for the Rig, but has no finished date, a new Rig Operation cannot be created. If the existing Rig Operation is not completed, a warning message appears.

9. Click **Apply** to save and continue adding data in the dialog or click **OK** to close the dialog and create the Rig Operation. The new Rig Operation icon displays beneath the Rig in the Well Explorer

### *Add Rig Equipment*

10. Right-click on the BOPs node and select **New BOP** from the drop-down menu. The BOP Properties dialog displays.

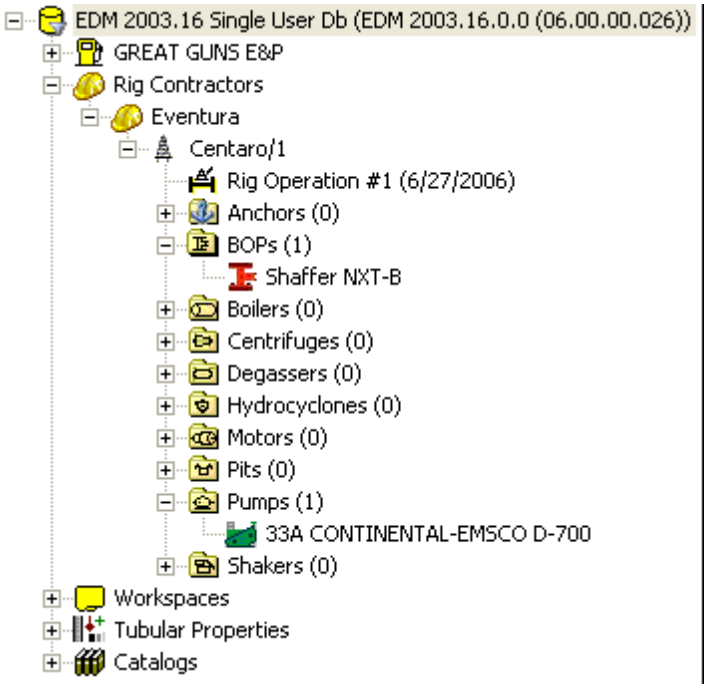
> **Rig Equipment**
>
> This section of the workflow demonstrates adding a BOP and Pump. Equipment data provides an input to reports and well analysis.

11. From the BOP Properties dialog, enter as much information as possible about the BOP then click **OK**. For further details about the specific fields and functions on each tab, see *WELLPLAN Help*.

12. Right-click on the Pumps node and select **New Pump** from the drop-down menu. The Pump Properties dialog displays.

13. From the Pump Properties dialog, enter as much information as possible about the pump then click **OK**. For further details about the specific fields and functions on each tab, see *WELLPLAN Help*.

    The following example shows the Well Explorer Rig Contractors node after creating a Contractor, Rig, Rig Operation, BOP, and Pump.



### *Associate the Rig to a Well*

14. Right-click on the Well node and select **Properties** from the drop-down menu.

15. Select the **Depth Reference** tab. Notice that Datum elevation information is listed in a spreadsheet on the tab.

16. On the last row of the spreadsheet, enter a name for a new well datum relative to the rig. The datum name can be any name of your choosing. Notice that the other column fields are enabled.

17. Click into the **Contractor** field and select the newly created Contractor from the picklist.

18. Click into the **Rig** field and select the newly created Rig from the picklist. The **Description** is optional and the **Date** references the datum creation date.

> **Associate a Rig with Drag and Drop**
>
> Another method to associate the Rig to the Well is to drag and drop the rig from the Contractor node to the Well in the Well Explorer. After the drag and drop is complete, select the **Contractor** and **Rig** in the Well Properties dialog Depth Reference tab to finish the association.

19. If desired, check the **Default** box to select the Rig as the default reference datum for all elevation and depth measurements.

> **WARNING!**
>
> Setting the Default reference datum to the Rig datum at the Well level only affects newly created Designs and Cases. Datum changes at the Well level do not affect existing Design/Cases.
>
> Changes to reference datums at the Design and Case level affect the entire data set and cause undesirable datum shifts. Use caution when changing reference datums at the Design/Case level.

20. Click **OK** to close the Well Properties dialog then close the WELLPLAN application.

## Use Data Input in WELLPLAN Software for OpenWells Reports

21. Launch OpenWells software (**Start > Programs > Landmark Engineer's Desktop 5000.1 > OpenWells**) if it is not already active.

22. If the login screen appears, enter the appropriate User ID and Password.

23. Verify that the Rig Association appears in OpenWells software: Right-click on the Well created in the WELLPLAN application, then select **Properties>Depth Reference tab**. Notice that the Contractor and Rig display in the Depth Reference tab spreadsheet. Click **OK** to close the dialog.

### *Create an Event*

24. Right-click on the desired well, then select **New Event** from the drop-down menu. Enter as much information as possible about the Event. For details about the Associated Rig Operations tab, see the next step.

### *Associate a Rig Operation to the Event*

25. From the Associated Rig Operations tab, click on the **Associate Rig Operation** button. The Associate Rig Operation to Event wizard opens.

26. Select the **Rig Contractor** and **Rig** that you created in the WELLPLAN software from the picklists, then click **Next**.

27. On the next screen of the wizard, select the **Select a rig operation from the list** option then click on the rig operation in the list. If you desire to use the rig as the default datum, select the **Create a new default** checkbox.

28. Click **Finish** to associate the Rig Operation from WELLPLAN software to the OpenWells Event.

29. When data entry is complete on the Event Properties dialog, click **OK**. The Event is created and displays in the Well Explorer beneath the Well.