

Petrel includes a tool for doing well correlation; The **Well Section Window** allows displaying well logs in a specified order, with the available logs and well tops.

Creating a New Well Section Window

To create a new well section window, follow the steps:

1. Click the **Window** menu command and choose **New Well Section Window** as shown in Fig.10.1.
2. An empty Well Section window is created as shown in Fig. 10.2.

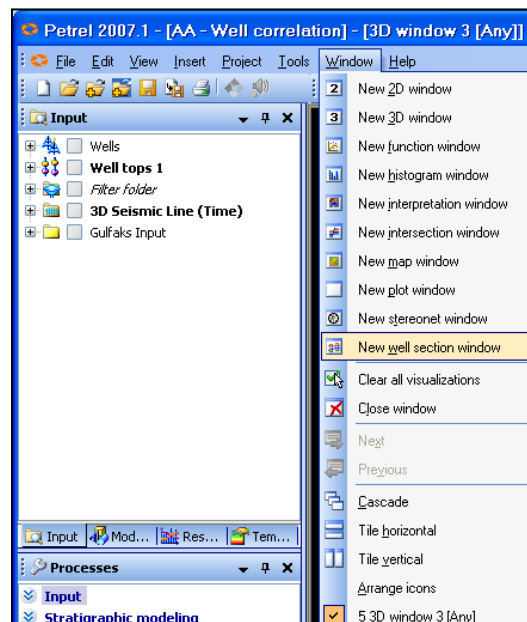


Fig. 10.1: The New Well Section Window menu command

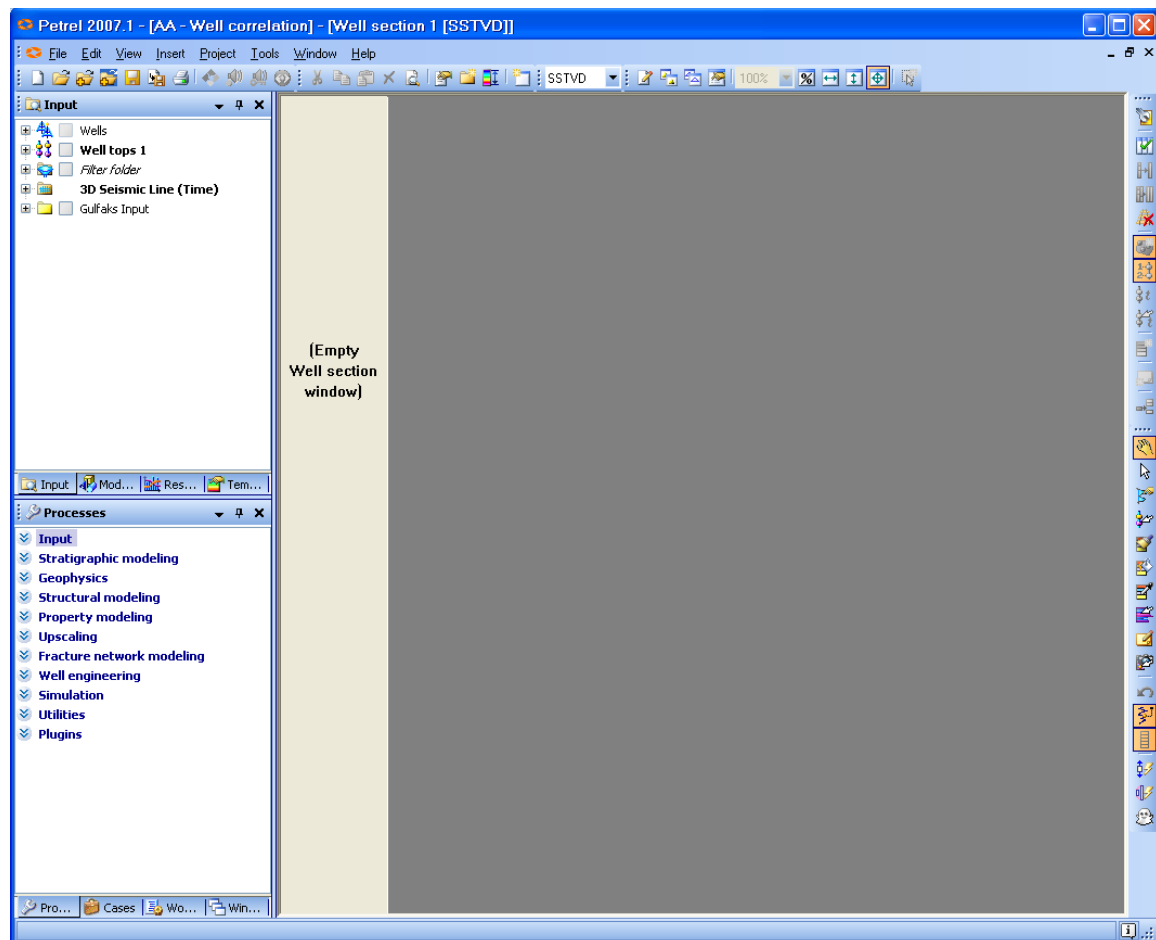


Fig. 10.2: An empty Well Section window

Displaying Logs and Tops

There are two ways to display Logs:

- a. To populate the window with well logs,
 1. Expand the **Wells** folder in the **Input Pane**.
 2. Choose the wells to be added to the section. For example, select the wells **B9, C4, C2, A10** and **C5**.

Notice: that whenever a well is clicked, it is directly sorted under the **Well Section** folder in the **Windows Pane** as shown in Fig. 10.3.

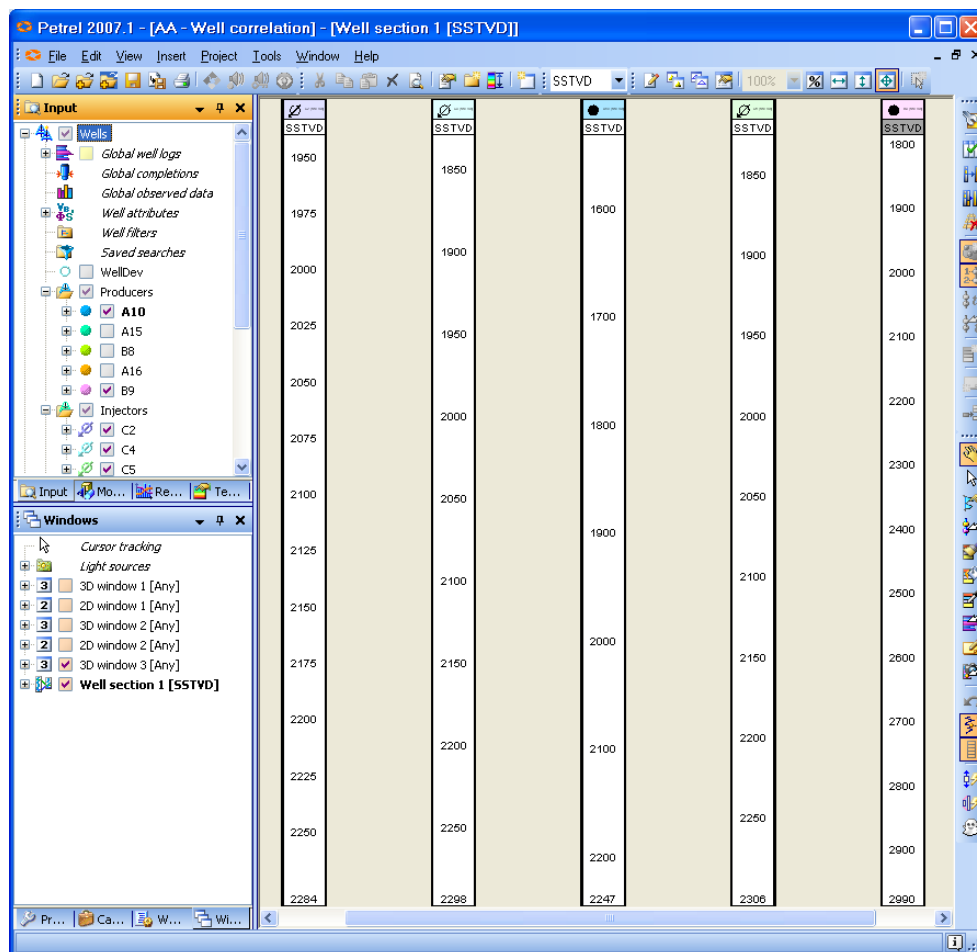


Fig.10.3: Some wells displayed in the Well Section window

3. Now select the logs to be displayed for all wells from the **Global Well logs** folder under the **Wells** folder as show in Fig. 10.4.

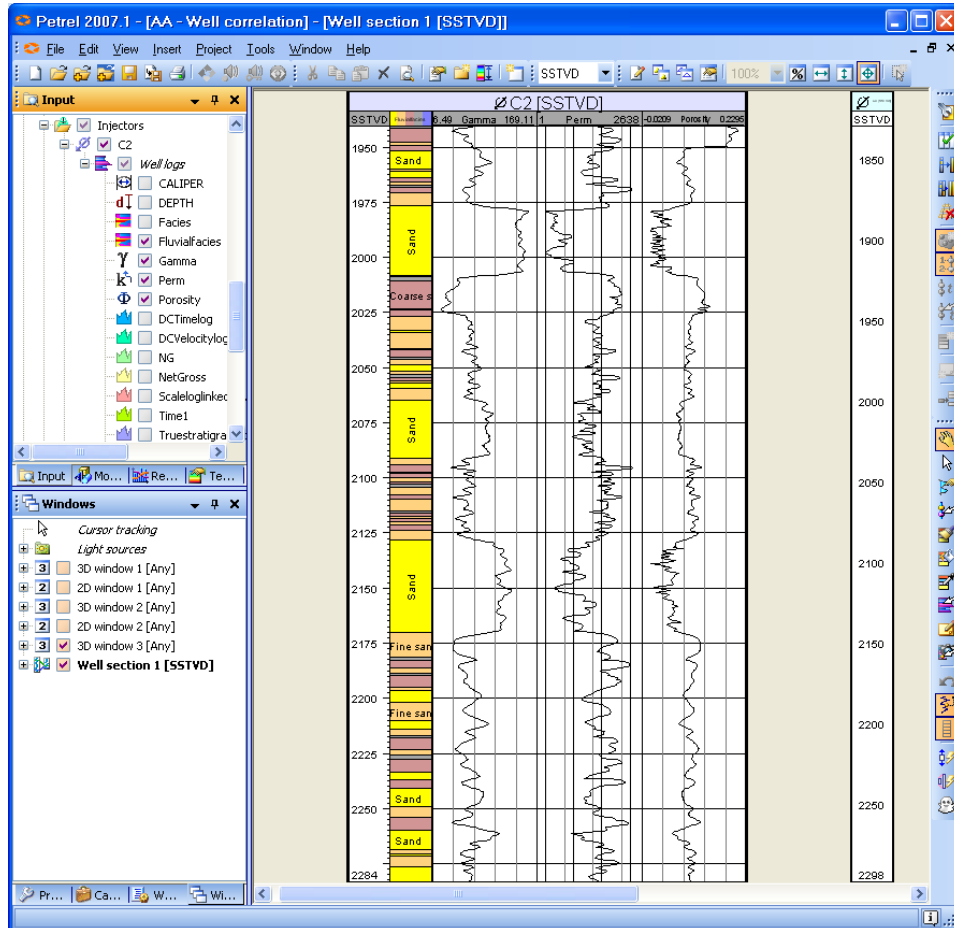


Fig.10.4: Well logs of well C2 displayed in the Well Section window

- b. Alternatively, well sections are created interactively by clicking them on a 3D window:
 1. Create a New Well Section Window.
 2. Display all wells in a 3D window.
 3. Activate the **Well Correlation** process under the **Stratigraphic Modeling** in the **Processes Pane**.
 4. Click **Add well to well section** icon on the **Well correlation 3D tools** toolbar. And now select the wells to be added to the well section. In this case, click the wells **C5, A10, B9, C4** and **C2**.

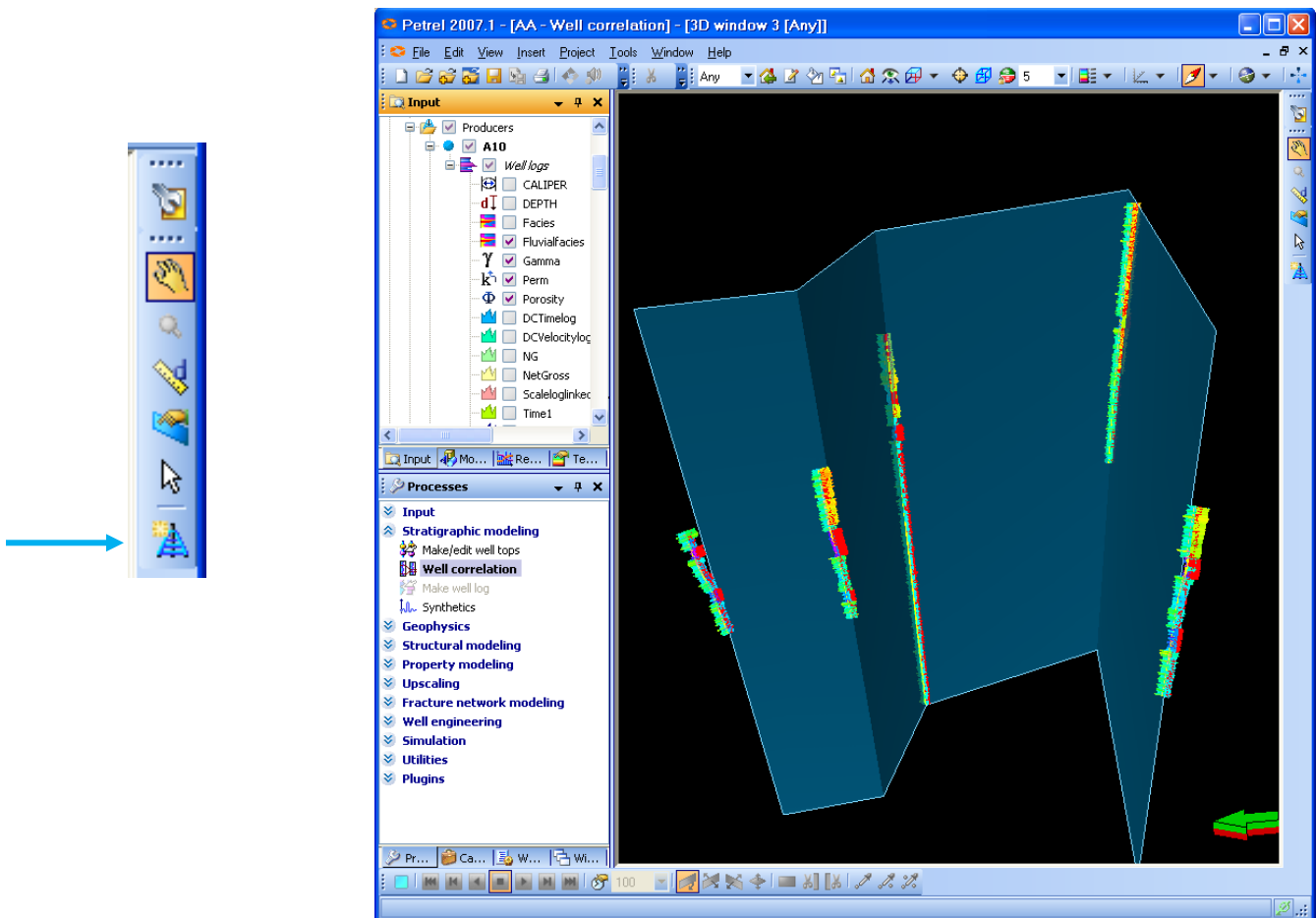


Fig.10.5: The Wells Displayed in the 3D Window with the Tool bar

Display the Well Tops by toggling on the checkbox in front of the Well Tops folder as shown by Fig. 10.6.

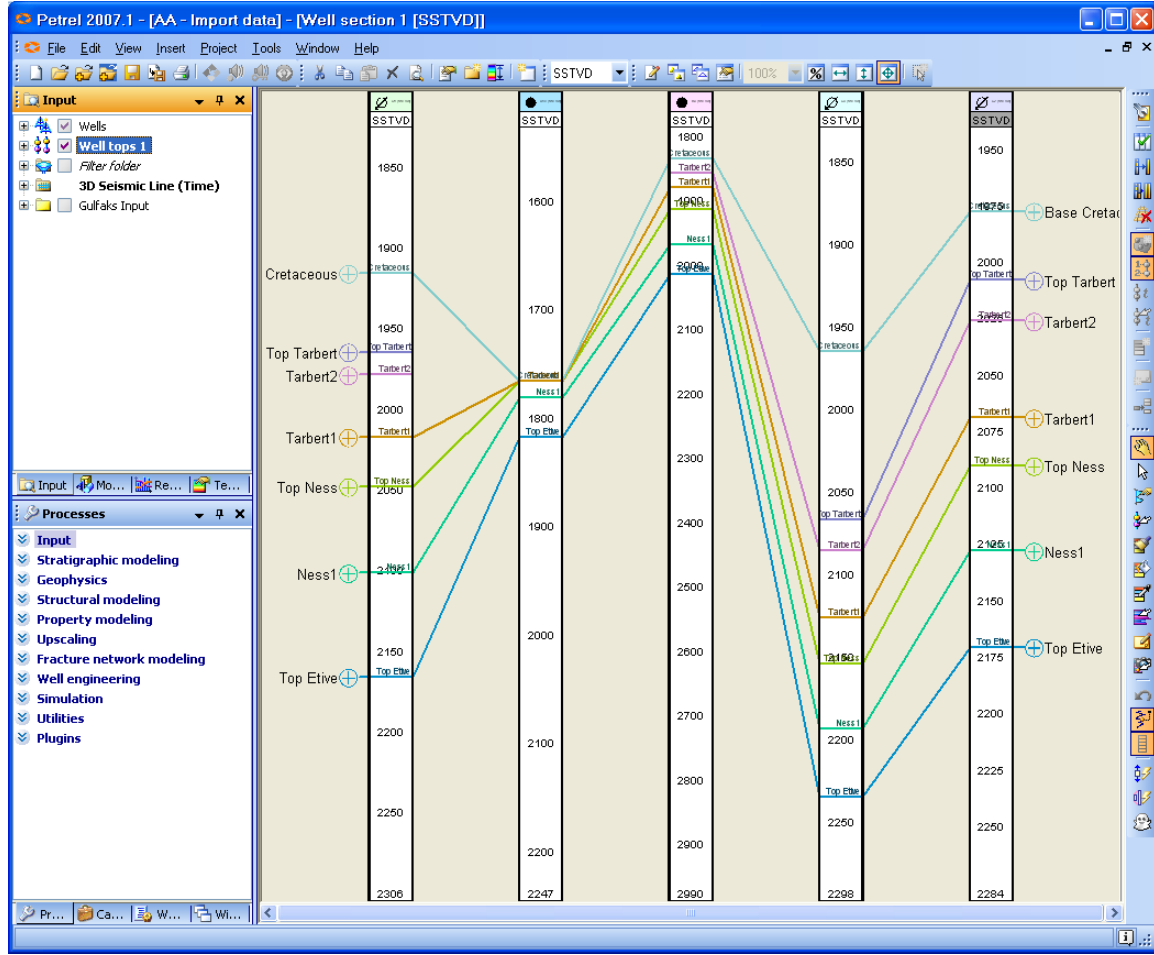


Fig. 10.6: Well Tops displayed in the Well Section window

Scrolling and Zooming

The well log display can be scrolled or zoomed. Scrolling and/or zooming may be done for each log individually or synchronized for all logs. When scrolling and zooming, you will use the gray and white scroll bar on the left side of each well panel. The larger the white area as compared to the gray area, the larger is the displayed proportion of the well. When the entire bar is white, then the entire well is being displayed.

To scroll one single well: position the cursor over the white area in the scroll bar. A hand will appear. Press the left mouse button to scroll up and down as shown in Fig. 10.7. To zoom one single well: Position the cursor over the border between the white and gray area in the scroll bar. A double arrow $\updownarrow$ will appear. Press the left mouse button over the white/gray border to zoom in/out as shown in Fig. 10.7.

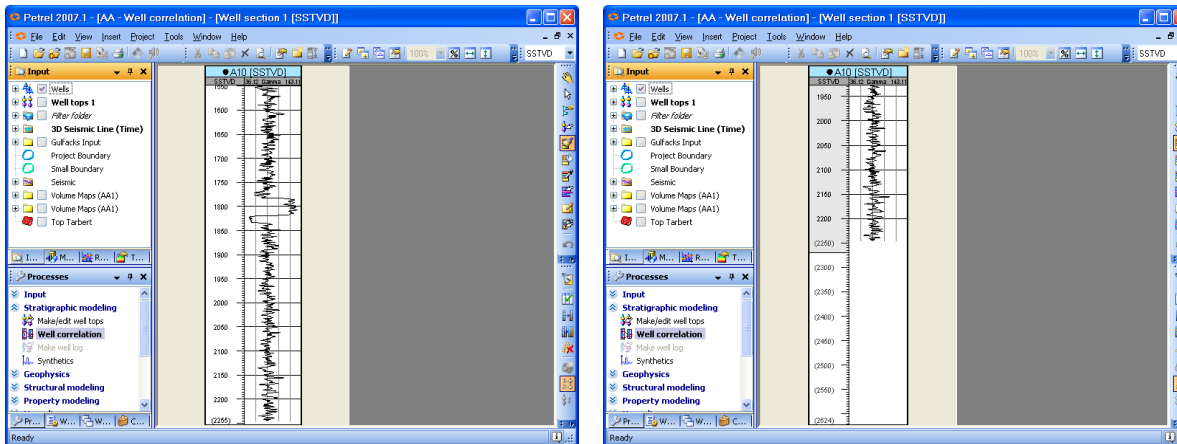


Fig. 10.7: Scrolling the well up and down

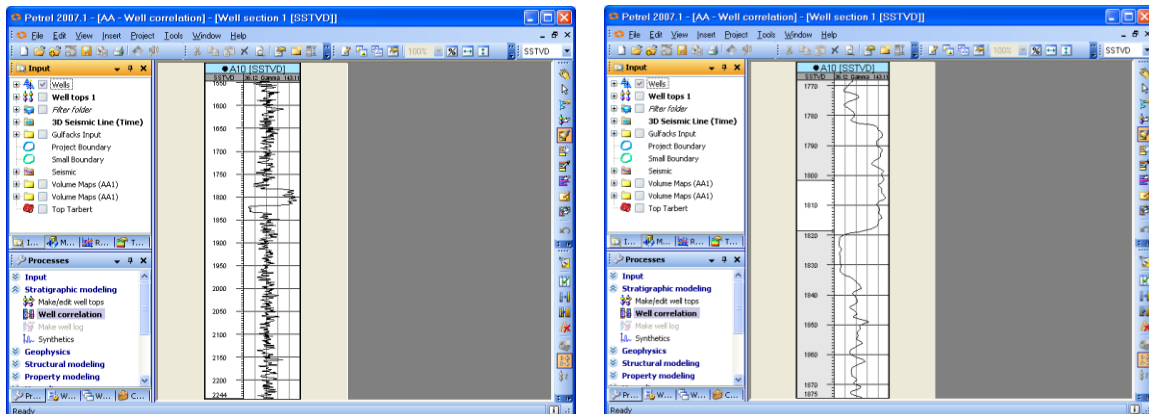


Fig. 10.8: Zooming in and out

Grouping of Logs

Several logs can be grouped into a single panel; e.g. Neutron and Density logs may be grouped to distinguish between shale and non-shale intervals. To create a group panel, follow the steps:

1. Make the Well Section active.
2. Right click on the well name; e.g. well **C2** under the well section.
3. Choose **Insert track panel**.

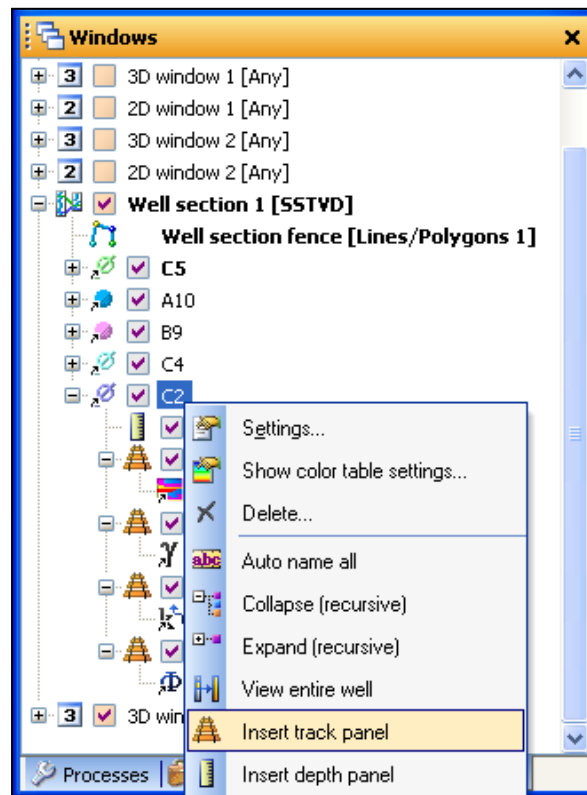


Fig.10.9: Insert Track Panel for well C2

4. A **track1** panel is created.
5. Drag and drop the required logs into the **Track** icon; e.g. **Porosity** and **Gamma** logs.

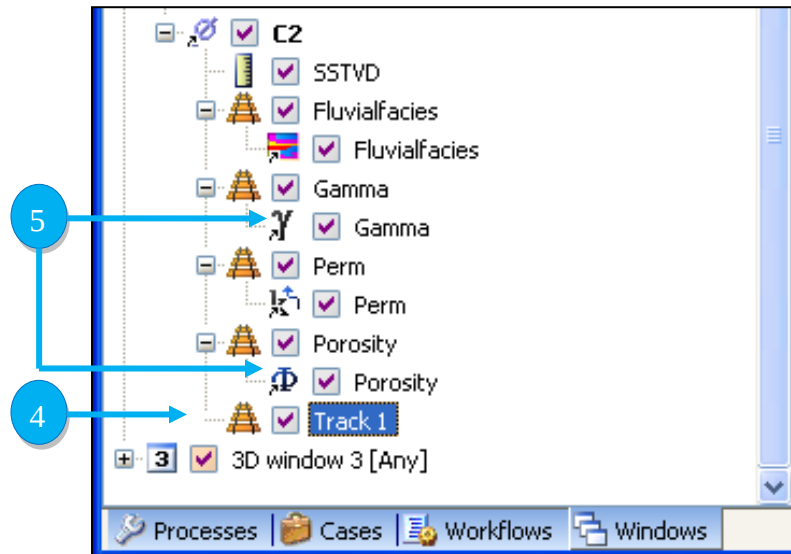


Fig.10.10: Track 1 is created

6. Change the track name from **Info** tab to **Gamma & Porosity** by double clicking on the **Track 1** and expand it to see the inserted log curves icons.

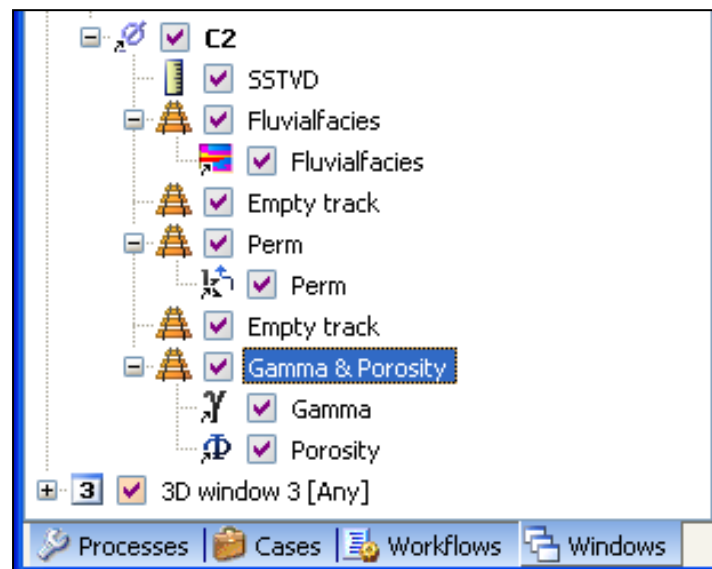


Fig.10.11: Gamma & Porosity after group it in one Track Panel

7. The track panel and the selected log curves will now be visible in the Well Section window as shown in Fig. 10.12.

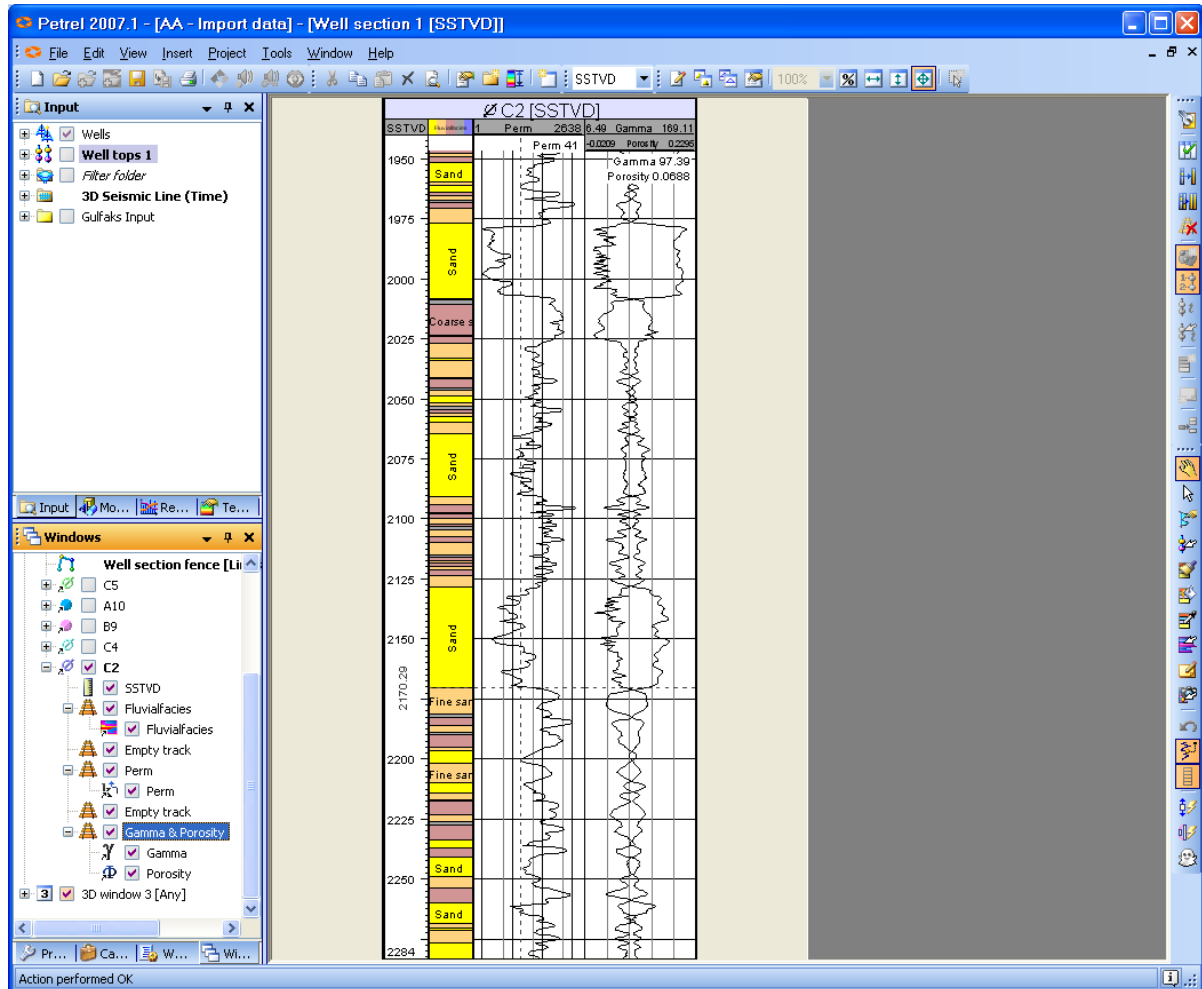


Fig.10.12: Gamma & Porosity log curves displayed in a Well Section window

Flatten on a Horizon

To scroll all logs simultaneously, you need to flatten the logs to a horizon. To do this, follow the steps:

1. Display the Well Section window.
2. Display well tops in the well section window.
3. Right click on the **Well Section** in the **Process Pane** and select **Settings** from the drop down menu.

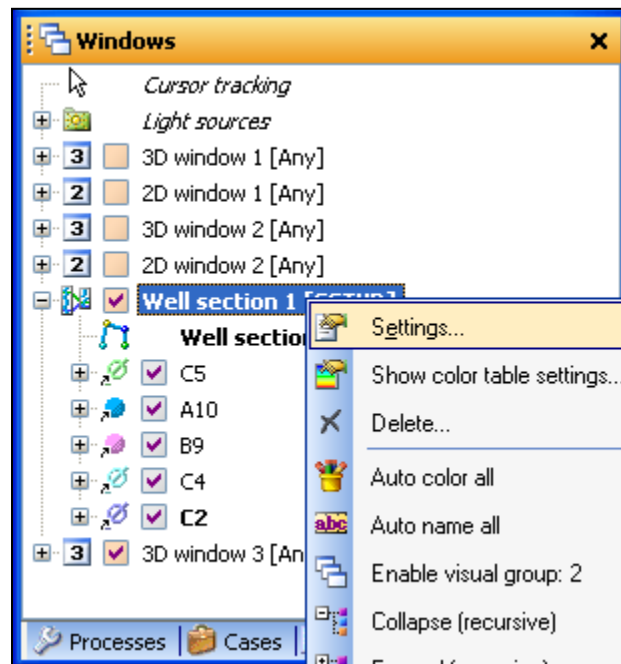


Fig.10.13: Settings for well Section 1

4. When the **Settings** dialog box appears, select the **Settings** tab.
5. Click **Flatten on well top** radio button, see Fig. 10.14.
6. Go to the **Input Pane** and select the well top to flatten all well logs to for example select **Base Cretaceous**.

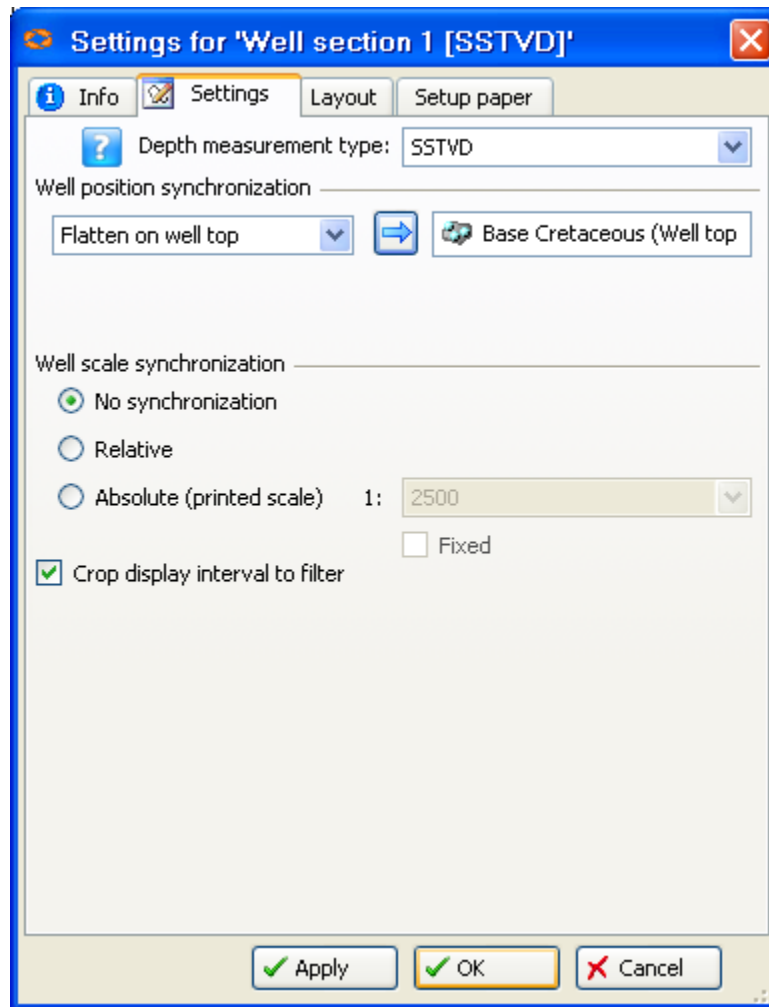


Fig. 10.14: Settings for the Well Section window

7. Click the **Apply** button; note that all logs will be flattened to the **Base Cretaceous** horizon, as shown in Fig. 10.15.

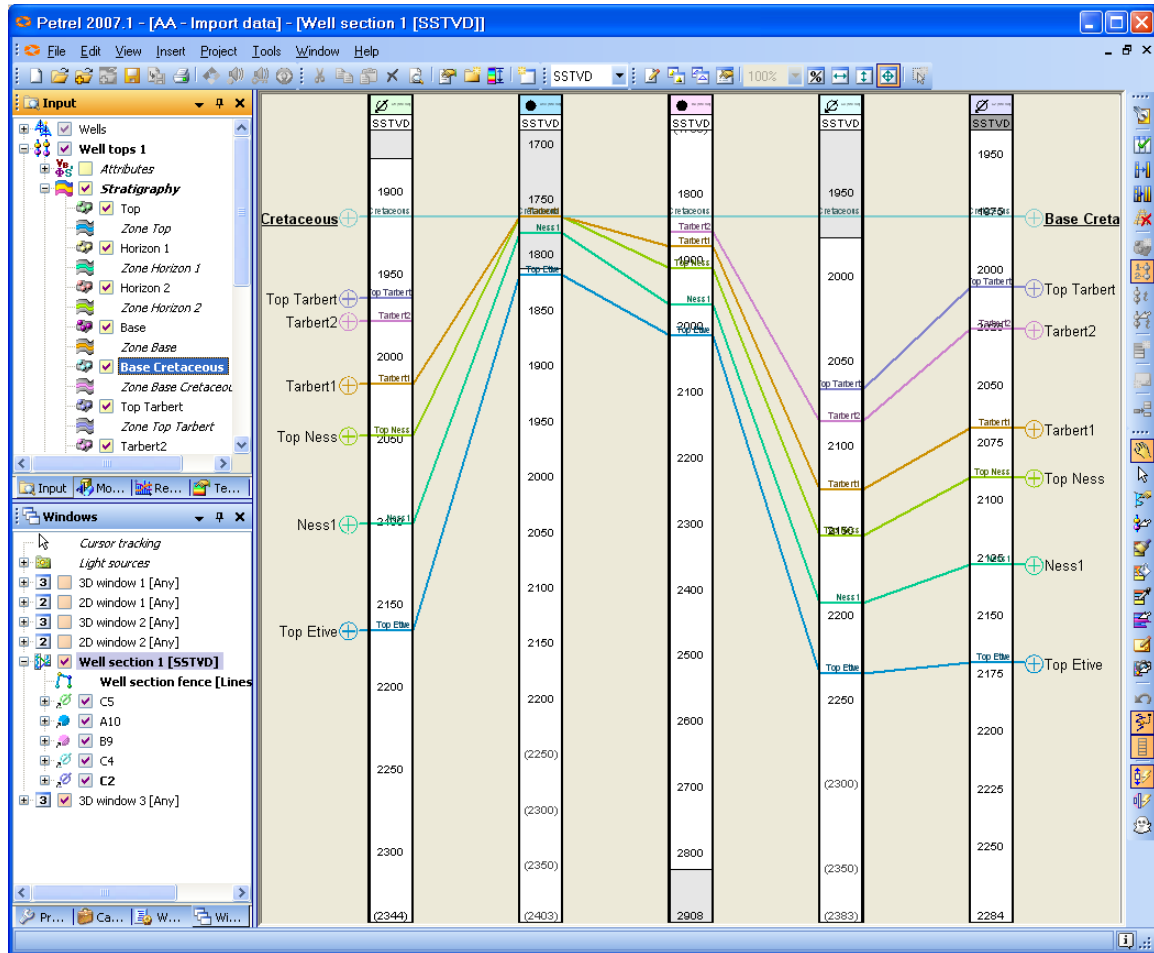


Fig. 10.15: All logs flattened to the **Base Cretaceous** horizon

Coloring of Logs

Color fill can be applied to areas between the panel edge and the log and/or between logs. For example, to fill color in the interval between two curves, follow the steps:

1. Open the **Settings** of one of the in the track panel (**Gamma & Porosity**).
2. Go to the "**Curve filling**" tab.
3. Enter a new interval and specify the interval to be filled as shown in Fig. 10.16.
4. From Fill edge choose **Curve** option.
5. Go to **Fill style** option and choose **Fill pattern** color and the **Fill color** that is desirable, and click the **Apply** button.

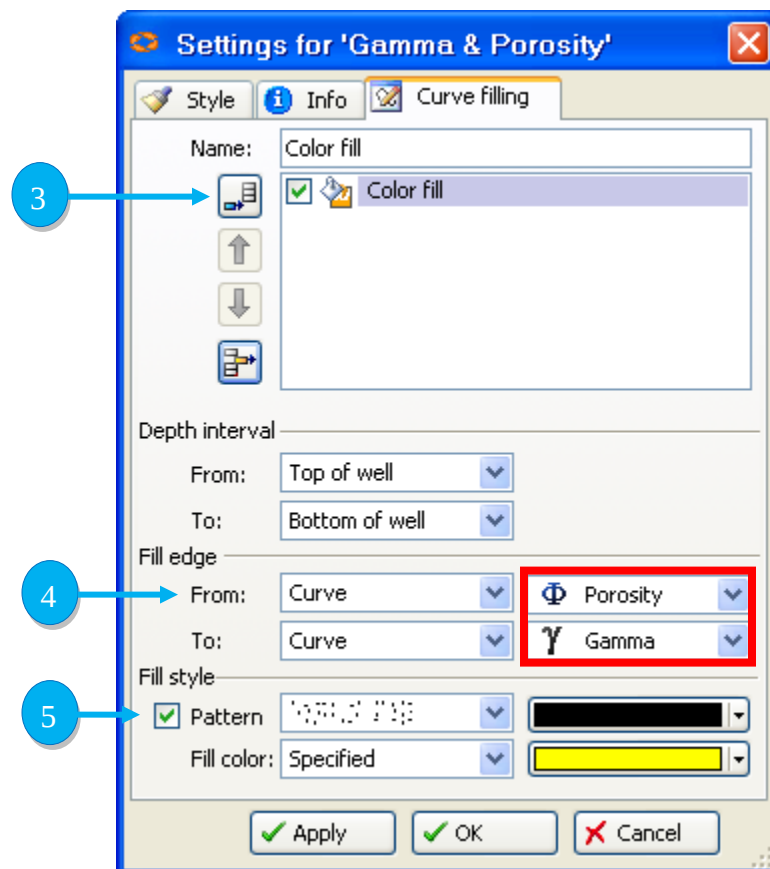


Fig.10.16: Settings for **Gamma & Porosity**

6. Repeat the same processes that you did before but you have to change from **Gamma - Porosity** to **Porosity -Gamma** as shown in Fig. 10.17. Then press **OK**.

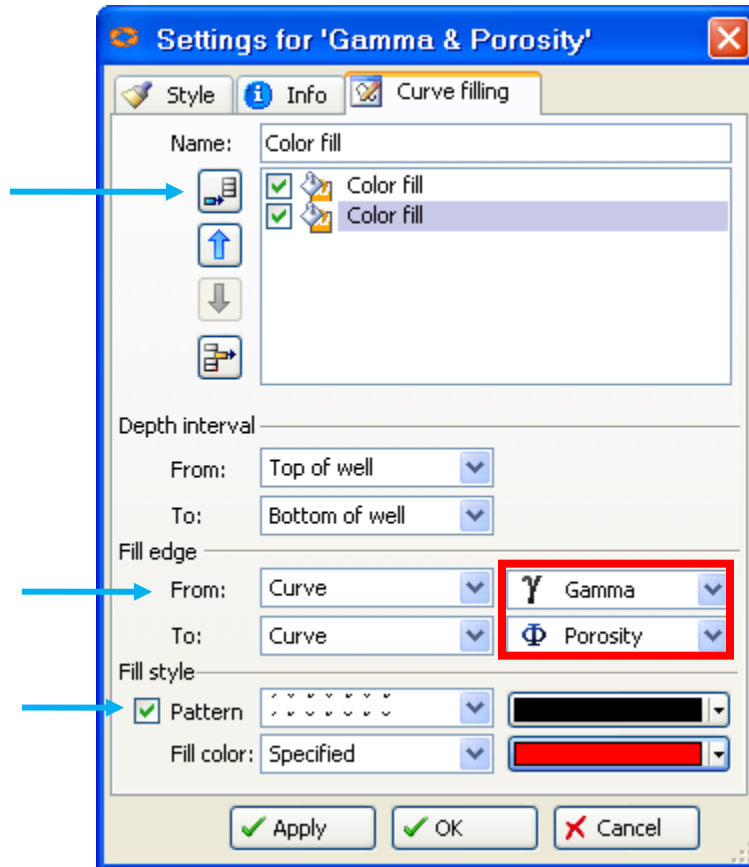


Fig.10.17: Settings for Gamma & Porosity

7. The color and pattern change accordingly as shown in Fig. 10.18.

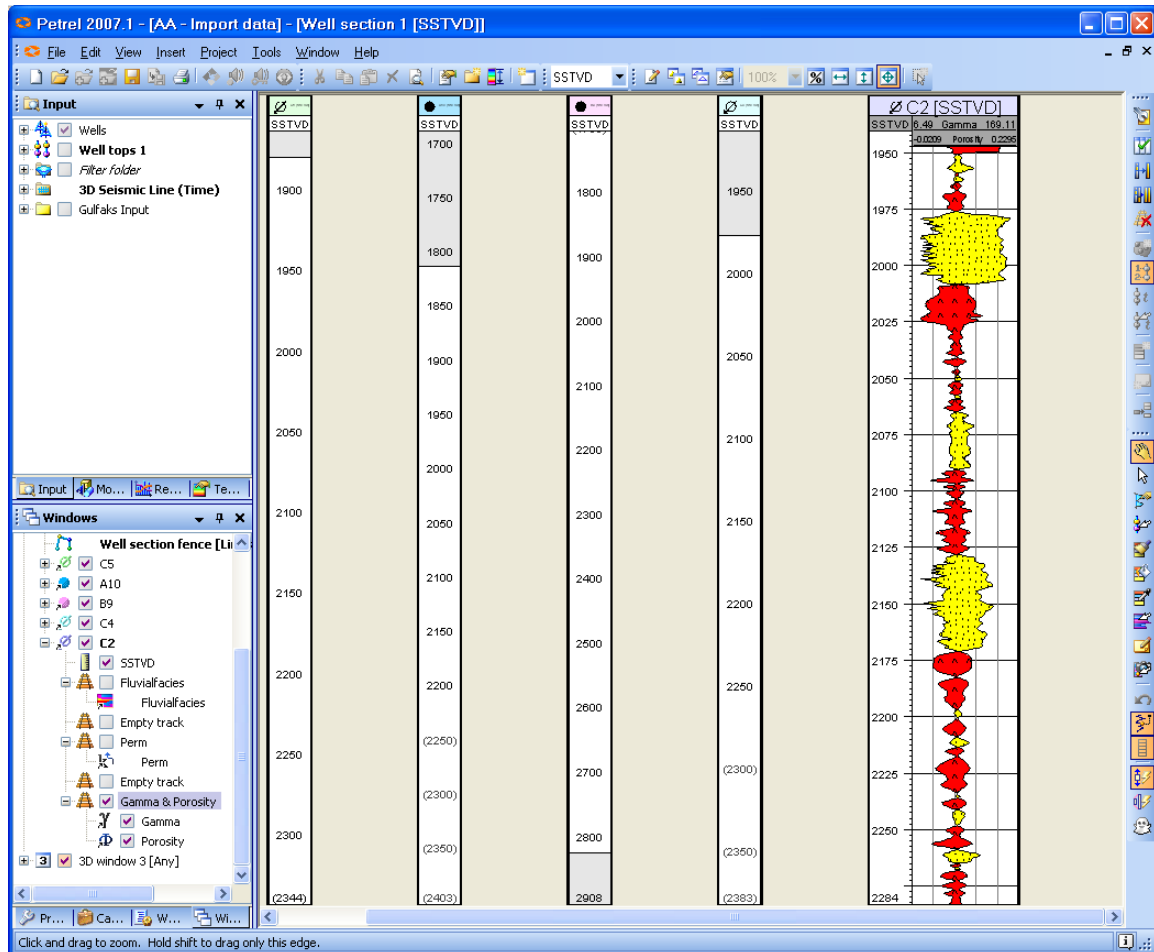


Fig. 10.18: Gamma & Porosity log curves is filled with the specified color & pattern

Similarly, for panels containing one well log only, to color in the interval between the log and the left panel edge, follow the steps:

1. Select the **Create/edit curve fill** icon.
2. Click in the area between the left edge and the Perm log to fill color in that interval as shown in Fig. 10.19.

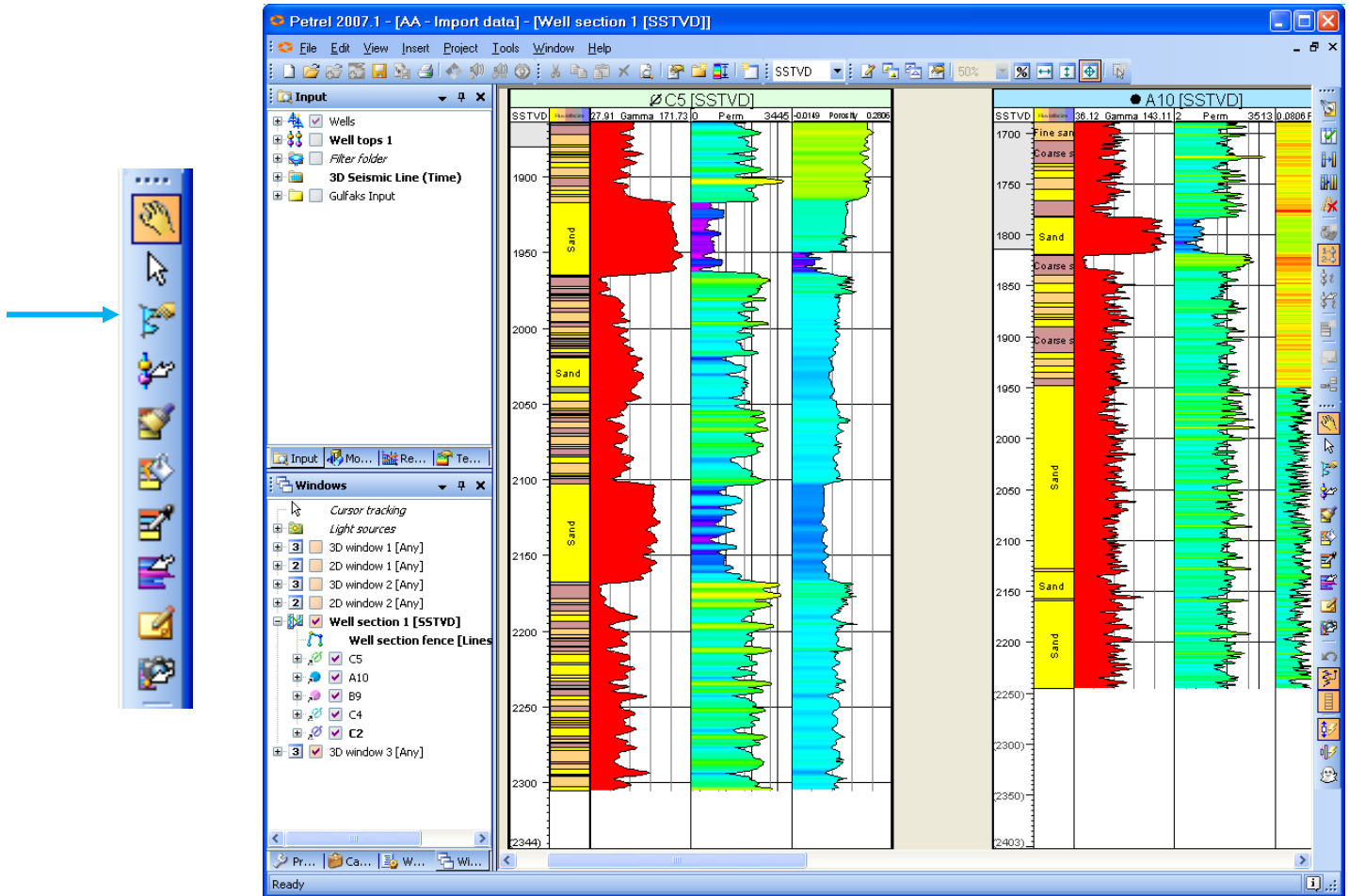


Fig. 10.19: The area between log curves is filled with the specified color & pattern

Edit/Add Well Tops in Well Section Windows

Well Tops can be edited by positioning the cursor on one of the well tops. An arrow will appear (↕). When the arrow is showing, move the well top to the required position.

Edit Well Tops

To edit well tops in the well section window, follow the steps:

1. Display the well whose well top is to be edited; in this case display **C5, A10, B9, C4** and **C2** Display Well Tops under **Well Tops** folder.
2. Activate the **Create/edit well tops [T]** icon as shown in **Well corr.2D tools** toolbar below. When the mouse Hovers on the well top, the double arrow (↕) appears,
3. Click on **Create/edit well tops [T]** icon to move the well tops as shown in Fig. 10.20.

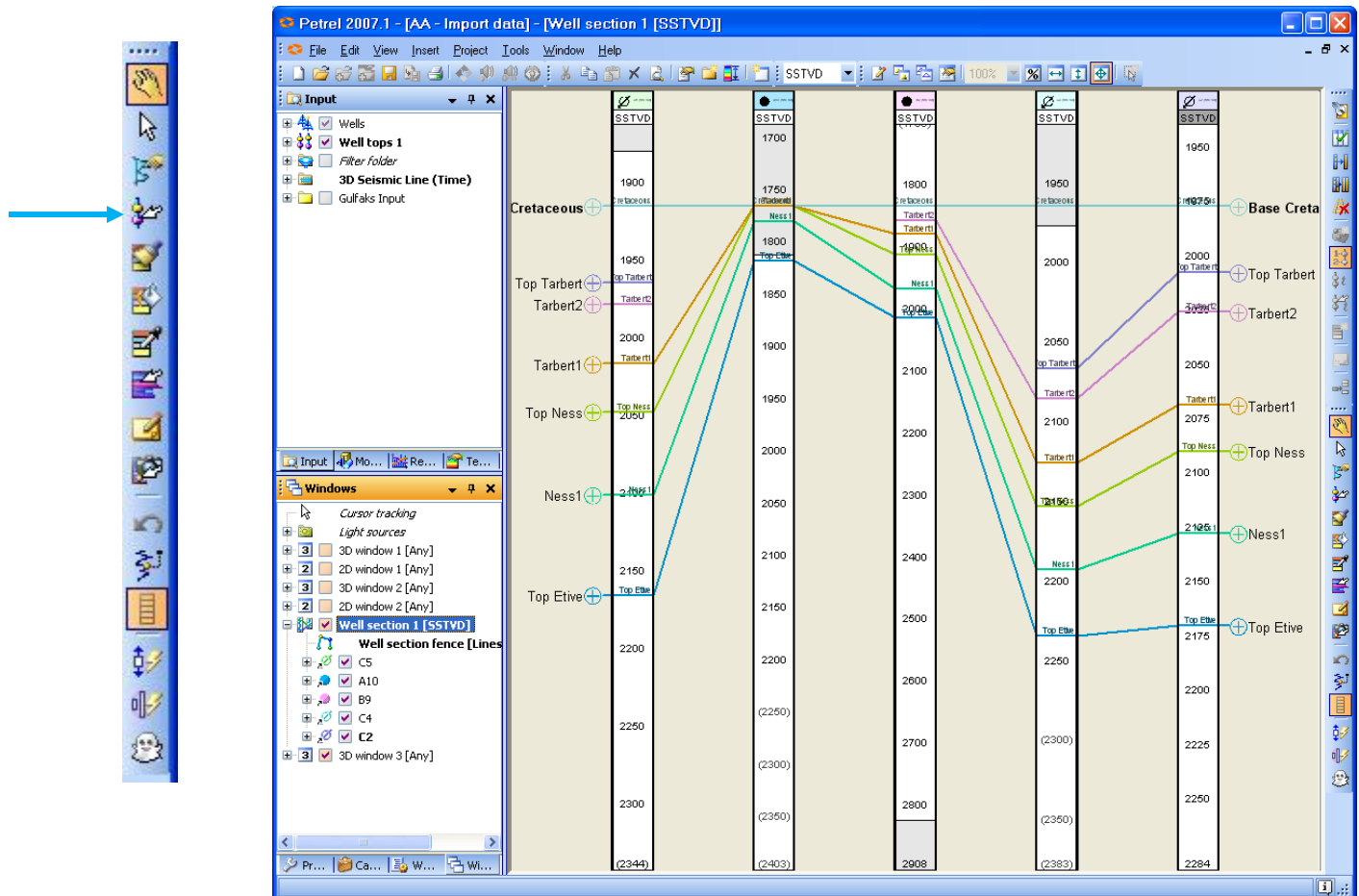


Fig. 10.21: Displaying existing Well Tops in a Well Section window

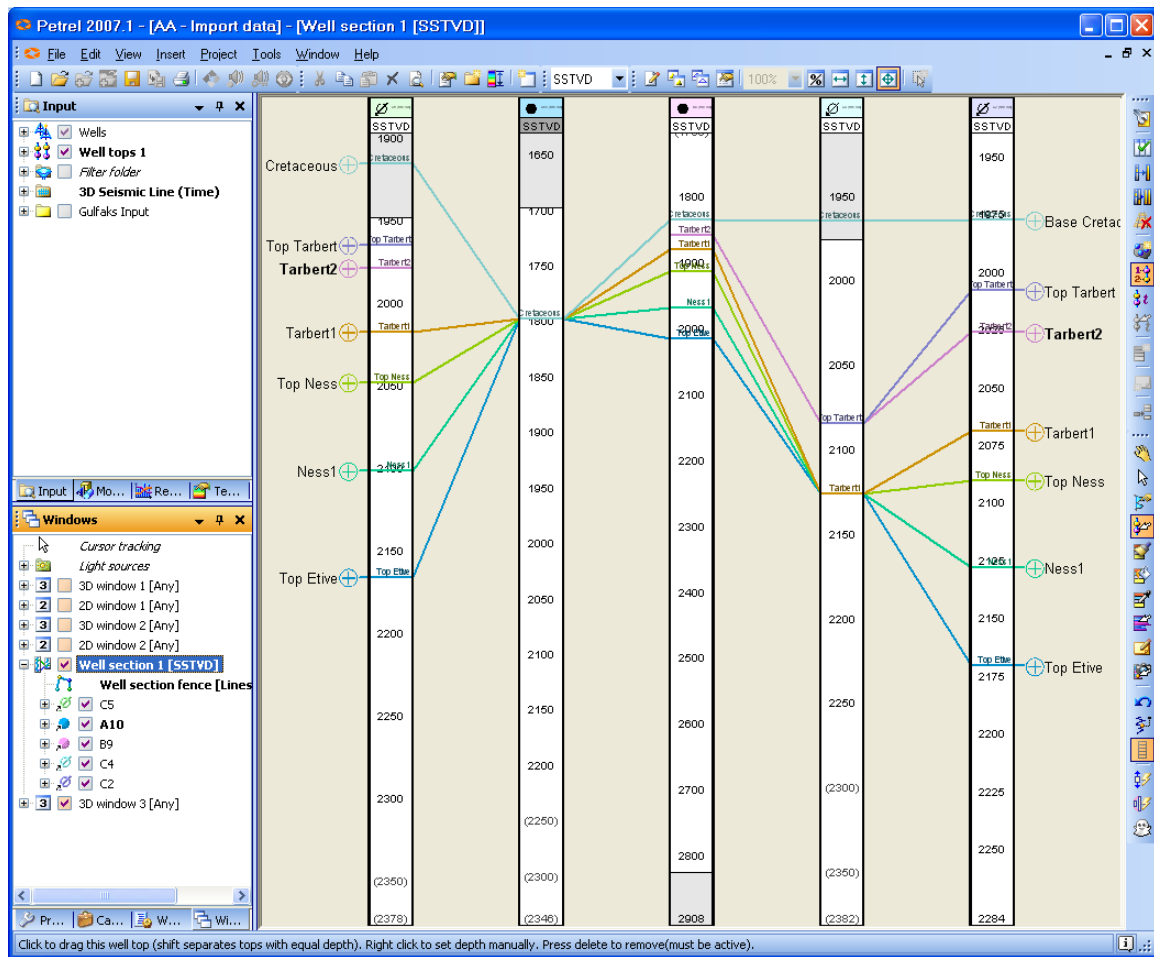


Fig.10.22: Displaying existing Well Tops (flattened together) in a Well Section window

Add Well Tops

To add a new well top, follow the steps:

1. Click on the **Add new well tops surface [S]** icon as shown in Fig. 10.20. Note that the **Create/Edit well tops** icon must be active in order to get access to the Add new well tops icon.
2. Insert a new well top by clicking on the position where it should be inserted. Note that if one of your well tops in the Well Tops folder is active, the new well top will create as the same name as shown in Fig. 10.21.
3. To insert new well tops with a new name, make sure to de-activate the existing well tops as shown in Fig. 10.23.

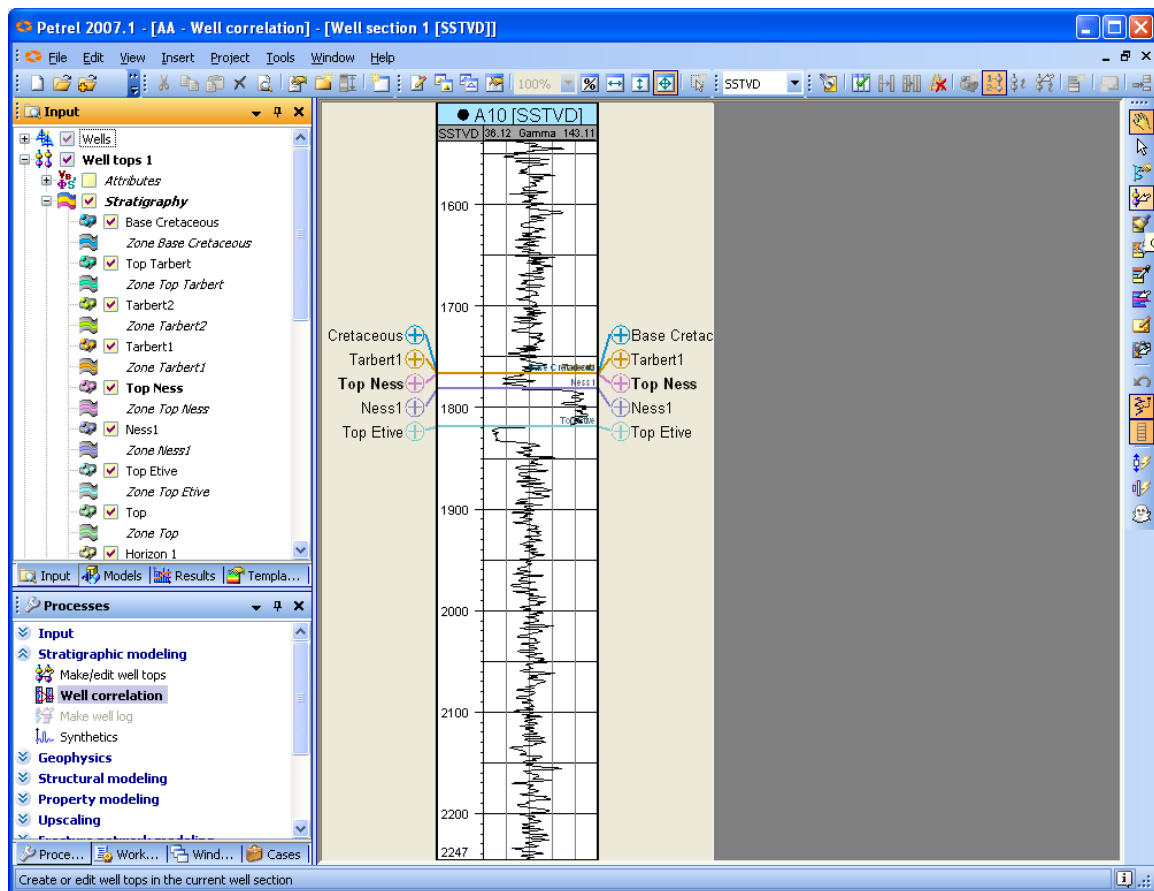


Fig. 10.23: Inserting new Well Tops in a Well Section window

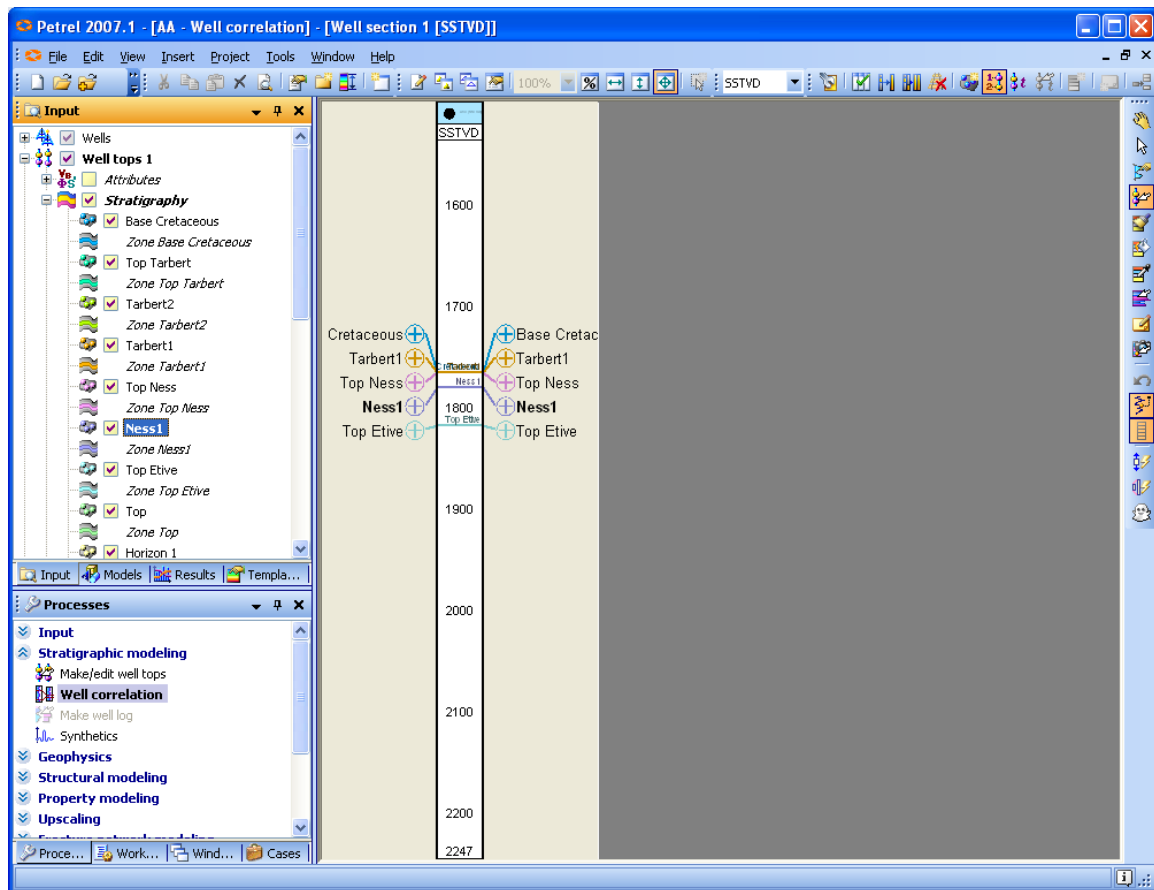


Fig. 10.24: Displaying the new Well Tops, for Top Ness in a Well Section window

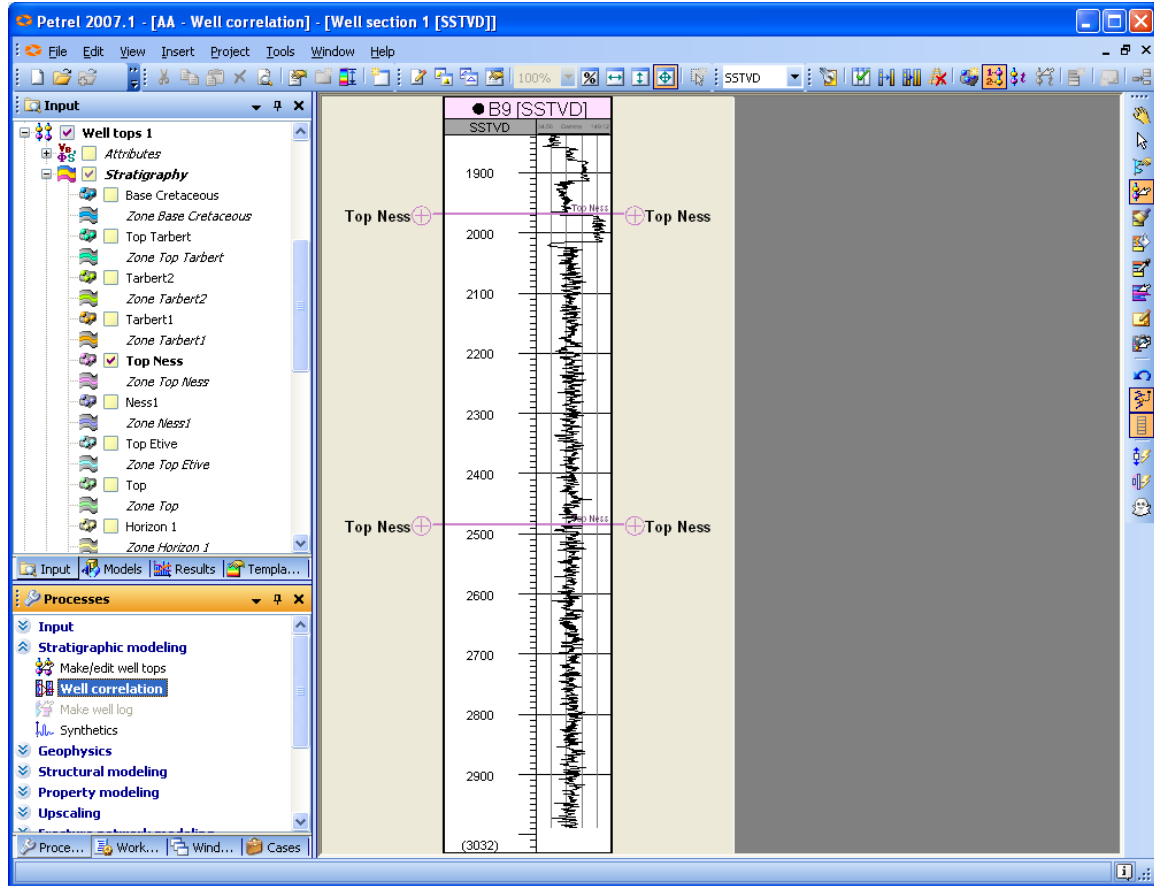


Fig. 10.25: Displaying the new Well Tops in a Well Section window

The settings of Well Correlation may be changed by:

1. Right click on the one of the wells for example C5 on the windows pane.
2. Choose **Insert Rose diagram**.

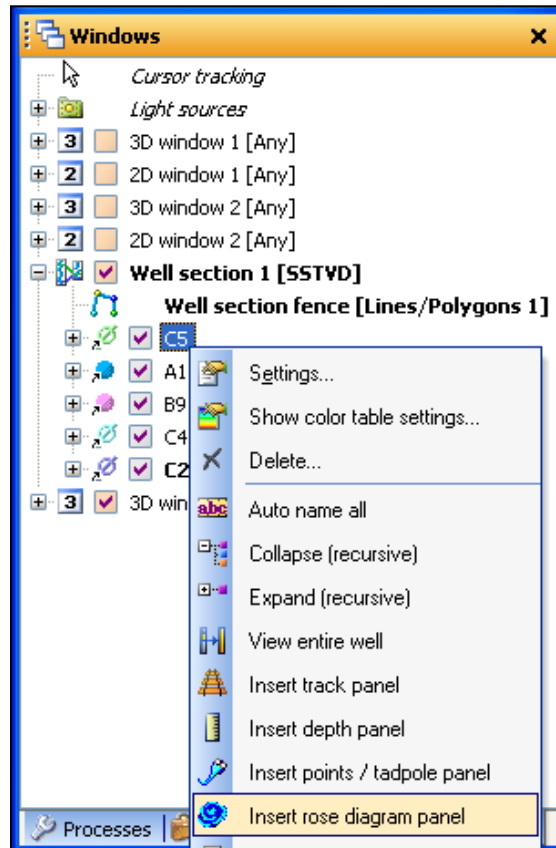


Fig.10.26: Insert Rose diagram panel for well C5

3. You can display the Rose diagram by two ways: **Logs** or **Well tops**. For example we will displayed by **logs** option for **Gamma**

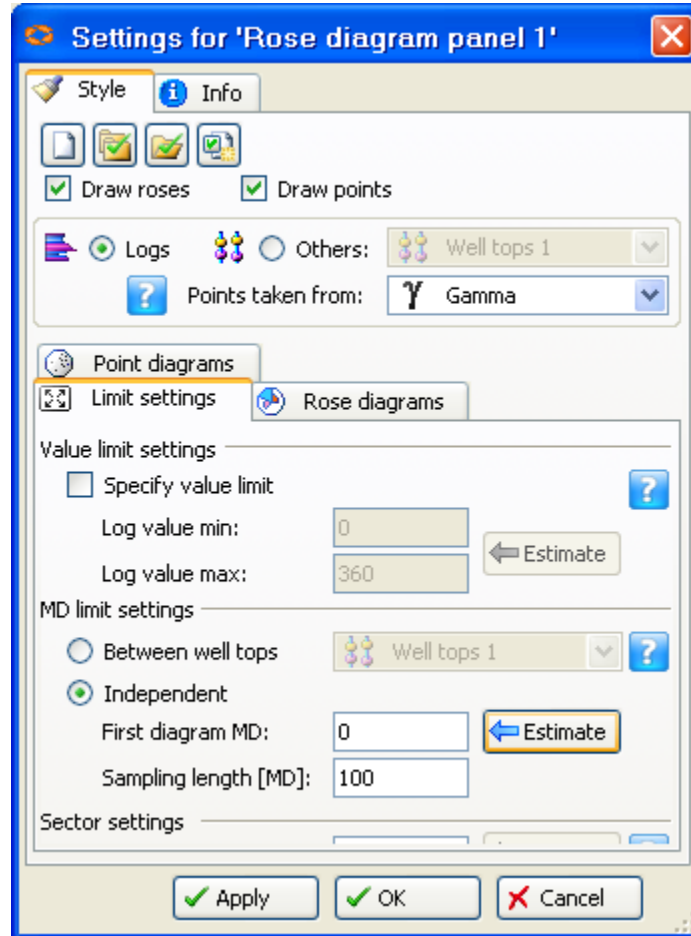


Fig.10.27: Settings for “Rose diagram panel”.

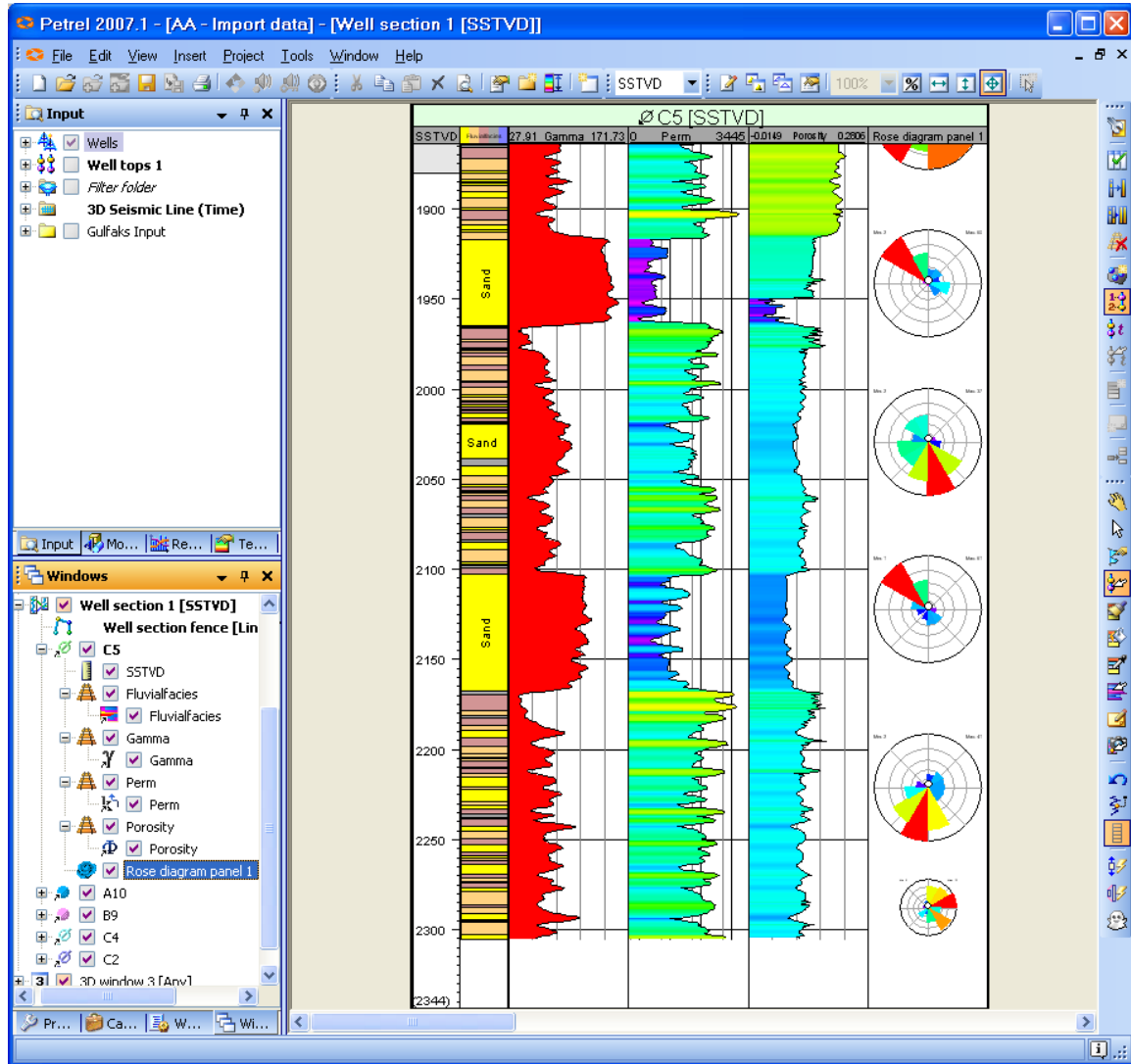


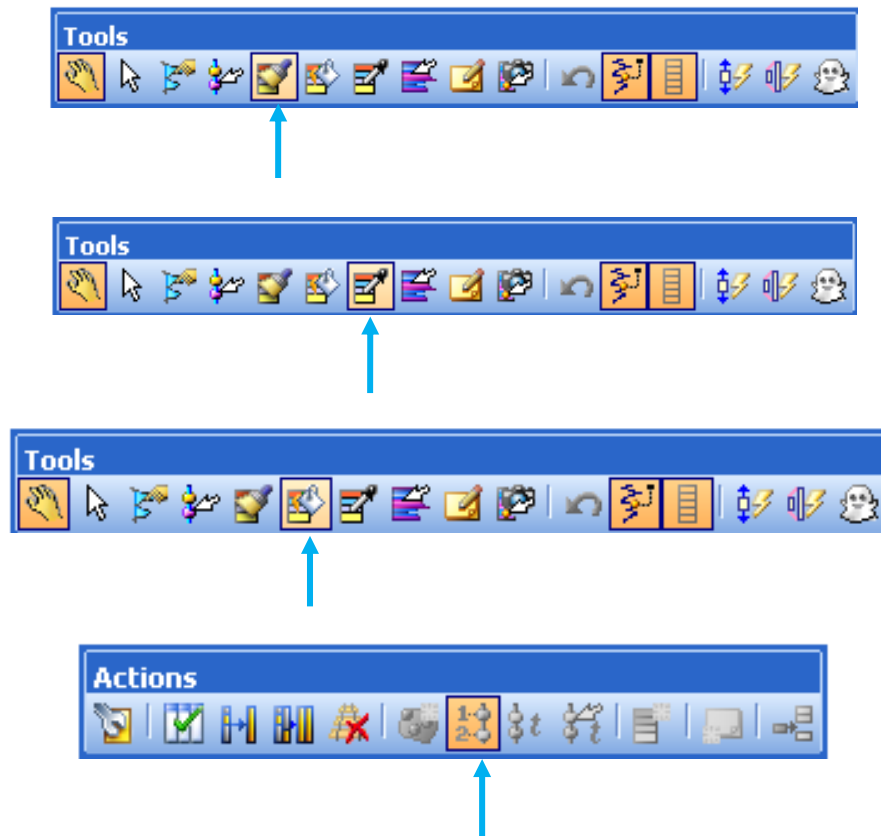
Fig.10.28: Displaying Rose diagram in well section for well C5

Interactive Facies Interpretation

To edit an exiting facies log: Activate the Paint, Flood or Pick discrete log class icon. Select facies by right clicking the mouse. Start edit on the log.

To create a new discrete log:

1. Click on the Paint discrete log, Pick up discrete log class, or Flood fill discrete log icon as shown in the Well corr. 2D tools toolbar below, The Create new discrete log icons will activate.
2. Press on the Create new discrete log icon.
3. A window will pop up in which you should specify the type of log to be created. In this case, choose fluvial facies as shown in Fig. 10.24.
4. Press OK. The new log will be placed under the Global Well Logs folder. See Fig. 10.26.



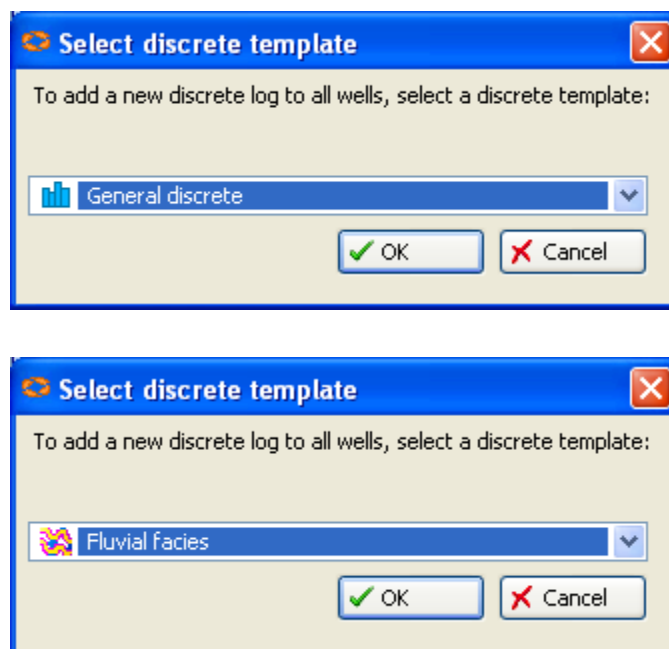


Fig. 10.29: Creating a new discrete log

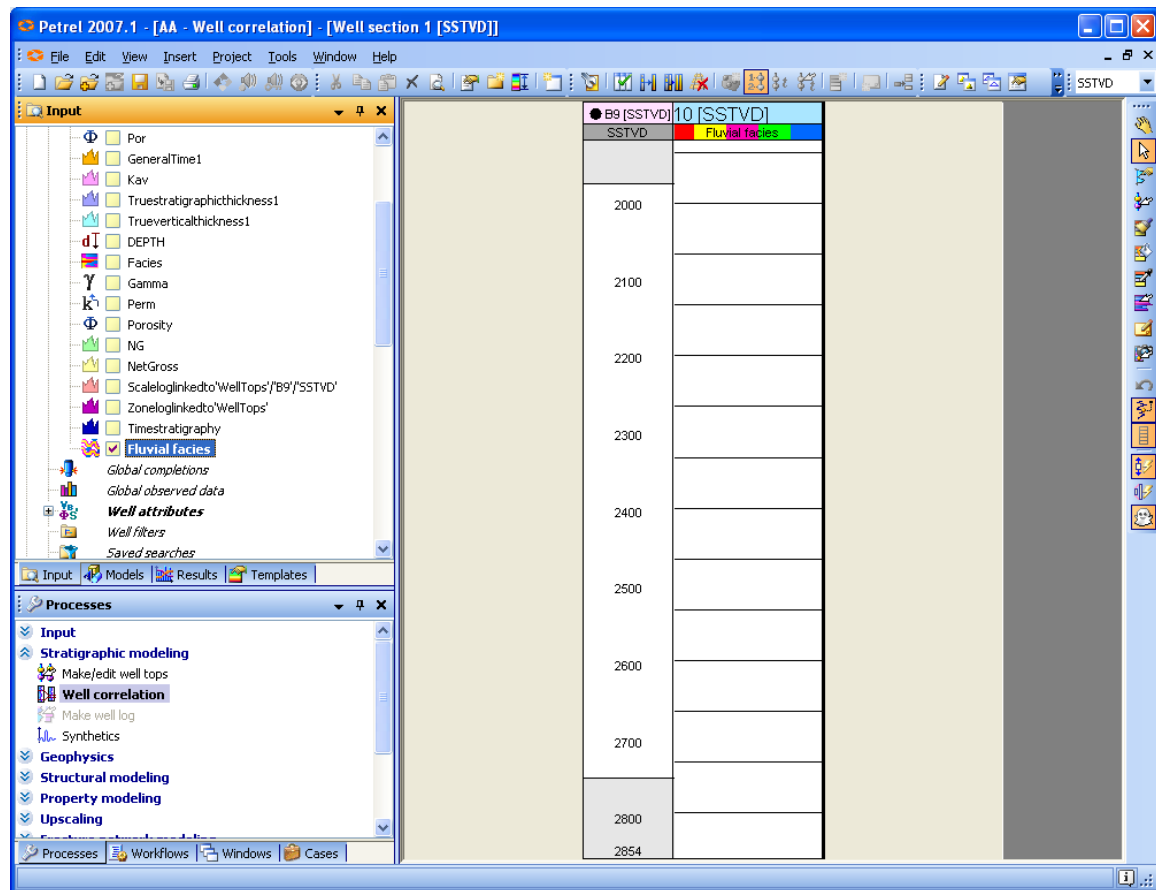


Fig. 10.30: Fluvial facies log is empty and placed under the Global Well Logs folder

Now spend sometime to display the logs that give information about the facies. Draw the different facies in the correct positions. See Fig. 10.29.

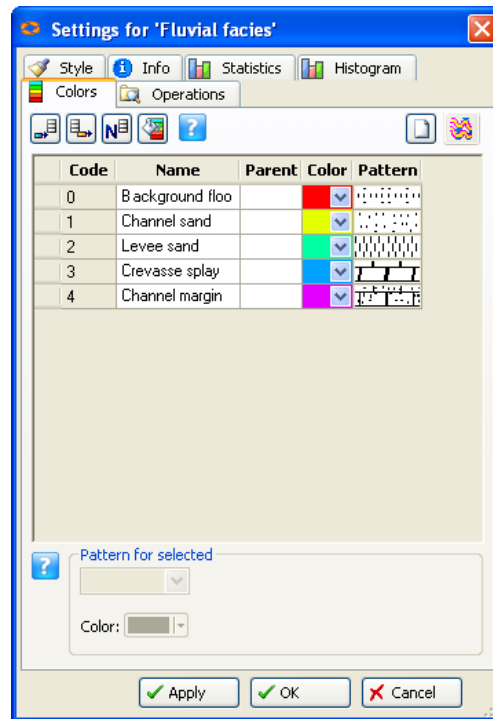


Fig. 10.31: Settings for "Fluvial facies" dialog box is displayed

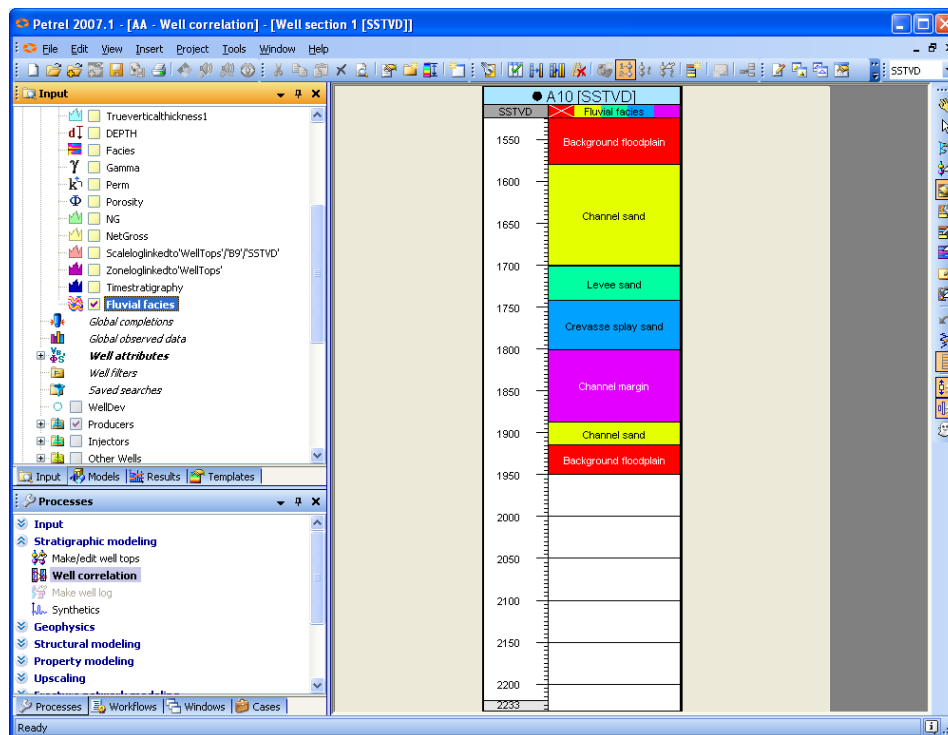


Fig. 10.32: The Fluvial facies log drawing process while the Settings for "Fluvial facies" dialog box is displaye