



How do I compute the borehole geometry for a well?

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The *borehole geometry* for a well consists of a complete coordinate set for the well borehole. This data is stored in the well curve file as channels TVDSS, XDEV and YDEV. This document describes how to convert an ASCII file containing directional survey information into a borehole geometry data set usable by TerraStation. One may also compute TVT and TST information if **bed** dip and azimuth information are available.

1. Click on **Input/Output** on the *Main Applications Bar* and select **True Vertical Depth** from the pull down menu.
2. Using the **Select Well** button you can select the well for which you would like compute TVDSS, X and Y offsets.

Note: The well data including KB should be loaded prior to using TVD module. See [How do I add a planning well to a project?](#) if your well is not yet defined in the project.

3. On the *TVD Options* control panel Click **Input Directional Survey** button.
4. On the **Directional Survey Loading** window set the combo box to either **ASCII file** or **Curve Data**.

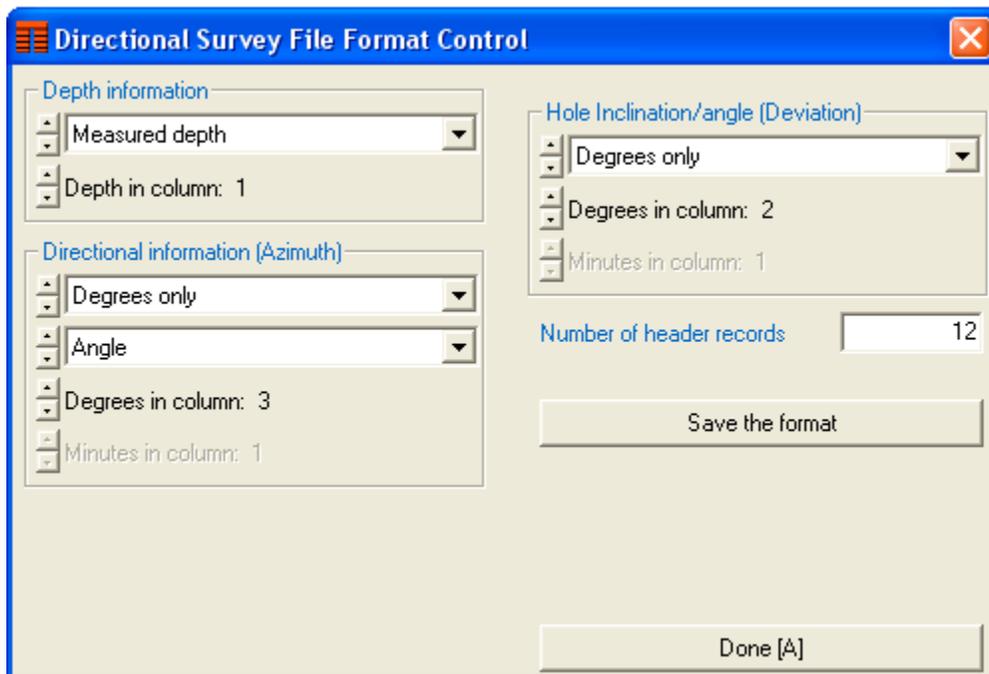
*Note: select **Curve Data**, if azimuth and dip of the borehole (inclination/angle) have already been loaded as curves into the well file.*

5. If the combo box is set to **Curve Data**, use both the **Deviation** and **Azimuth** buttons to define the data for the borehole computations. After clicking on, say, the **Deviation** button, select the deviation curve from the list of curves present for the well. Repeat the process for the **Azimuth**. Click on **Done**.

Go to [Working with the computed borehole geometry](#) for steps on displaying the results, storing them, or computing TVT/TST data with the new geometry.

Computing the borehole geometry from an ASCII directional survey file

6. If the combo box is set to **ASCII file**, Click the **Select File** button and, using the **File Selection** window, find the directional survey data file for the selected well. After the file is selected it is displayed on the screen.
7. Clicking the **File Format Control** button will change the **Directional Survey Loading** window to the **Directional Survey File Format Control** window. On this window are controls for *Depth Information*. Set the combo boxes appropriately. Generally, the first toggle button is set to Measured Depth. Set the second toggle button to the column number of the measured depth values in the file.



For example, *Depth in Column: 1*.

8. Set the combo boxes under *Directional Information*.

If the values in the file look like example1:

```
2650 20.74 337.35
```

set the combo box and toggle to:

Degrees Only; Angle; Degrees in Column: 3.

If the values in the file look like example2:

```
12200 N 3 50 W 21 18
```

set the combo boxes and toggles to: *Degrees & Minutes; Relative Bearing;*

Degrees in column: 3; Minutes in column: 4.

9. Set the combo box and toggles under *Hole Inclination/Angle*. In [example1](#) the setting should be: *Degrees Only; Degrees in Column 2*. In [example2](#) the setting should be: *Degrees & Minutes; Degrees in Column 6; Minutes in column 7*.
10. Confirm that the number of header records is correct. If not, set the **Number of Header Records** by placing the cursor inside the dialog box and typing a number. Click **Done**. Next Click **Done** on the **Directional Survey Loading** window.

Working with the computed borehole geometry

1. From the main TVD control panel, Click the **Display Survey Results** button to view the numbers computed by the survey calculations on the screen. At this stage, the results have **not** been written into the well file. Set the calculation method combo box to the desired method, e.g. **Minimum Radius of Curvature** on the **Directional Survey Computation** window.
2. Check the Additional Calculations TVD check box. If you do not need to calculate TVT and/or TST curves simply Click **Accept**.

The results of the calculations are output to curves TVDSS, Y offset, and X offset in the well file. Click the Cancel button when finished.

Computing TVT and TST from bed dip and azimuth

If you previously loaded the bedding information (dip and azimuth) into the well file, you can calculate TVT and TST.

Note: These dips and azimuths MUST be the dips and azimuths of the beds of rock penetrated by the borehole, NOT the dip and azimuth of the borehole itself.

If you have this data in an external ASCII file, you can use the **Import/Export - Import Well** options from the main application bar to load it into your existing well.

See [How do I load an LAS file?](#) for information on how to do this for LAS data files.

See [How do I keyboard enter log curves for a well?](#) for more information on how to enter your data via the keyboard. Be sure to enter both the bed dip and azimuth data.

Keyboard entry of curves can be accessed through a shortcut on the upper left of the window, the Edit menu item (above the large window on the left.)

1. If bedding information (dip and azimuth) exists for the well, you can calculate TVT and TST. To do this, Click the *Computations button*, check one of the boxes labeled **TVT** or **TST**.
2. Additional buttons and combo box for the TVT and TST options now appear below the *Bedding Information*.
3. Click on the **Bedding Dip** button and select the curve where the bed dip data were previously loaded and Click **Accept**.
4. Click the **Azimuth** button and select the curve with the bed azimuth data. Click on **Accept**.
5. If necessary, set the **Thickness at start depth** by placing the cursor inside the dialog box and typing a number. Set the **Start Depth (MD)** in a similar manner. For example, if you want the thickness values to begin at a depth of 5000 feet, set the Start Depth slider to 5000 and the **Thickness at Start Depth** to zero.
6. Click **Accept** on Directional Survey Computation window to proceed with the computations. The results of the calculations should be displayed on the screen.
7. If you calculated TVT and would like to compute TST, put the check mark into the corresponding check box and Click **Accept** again. Click Cancel to close the Directional Survey window.

TVT and/or TST will be written into the well file. You can then use these as depth reference in **IMAGELog** to create well displays using TVT or TST as the depth basis.

The **IMAGELog** depth reference control button is at the top of the same panel as the vertical scale control. It is displayed after restoring a template or using the **Previous Image**.

Thanks for using TerraStation