

Target Geological Interpretation using CAD Tools

This How-To Guide introduces you to the basic Geological interpretation and CAD functions available in Target. The procedures are designed to show you how you can use these tools for drawing a geological interpretation.

Topics covered in this How-To Guide:

- Import Geological data
- Display an interpretation map
- Create and work with map groups
- Zoom for better viewing detail
- Drawing lines, poly-lines and polygons
- Use colour and polygon colour tools
- Create and edit rock code files

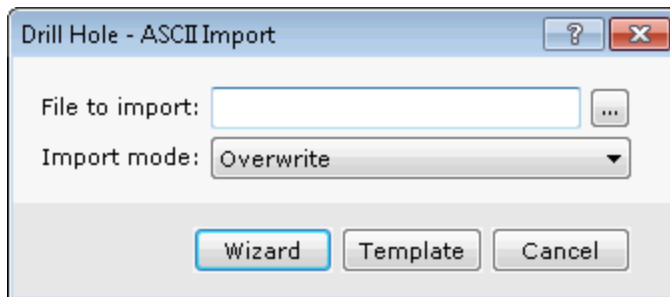
Importing Geological Data

A Geosoft database is capable of handling a wide variety of geological parameters ranging from rock codes, extended text descriptions, alteration types, contact data such as fractures or faults, and other core log information that is important in your drilling project.

Drilling data from many different sources can be imported into the program, including ASCII/text, Microsoft Excel, Microsoft Access, ODBC, Acquire and LAS files. The example below shows how to import ASCII/text format; for more information on these formats, select the appropriate option from the *DH-Import* menu and click on the *Help* button.

To Import Geological Data (from an ASCII/text file):

1. On the *DH-Data* menu, select *Import* and then **Text file**.
The *Drill Hole – Ascii Import Wizard* dialog appears.



2. Using the *Browse* button, select the file from your working directory and click the **Open** button.
The system returns you to the *Drill Hole – ASCII Import Wizard* dialog and displays the file name you wish to import.
3. Click the **Wizard** button to begin the wizard for importing your data into a specific format, or click the **Template** button to use an existing database format.



You can go back and re-import or overwrite your data using these same steps.



You are now ready to begin working with your data. More geological data can always be added later using the same Import Wizard.

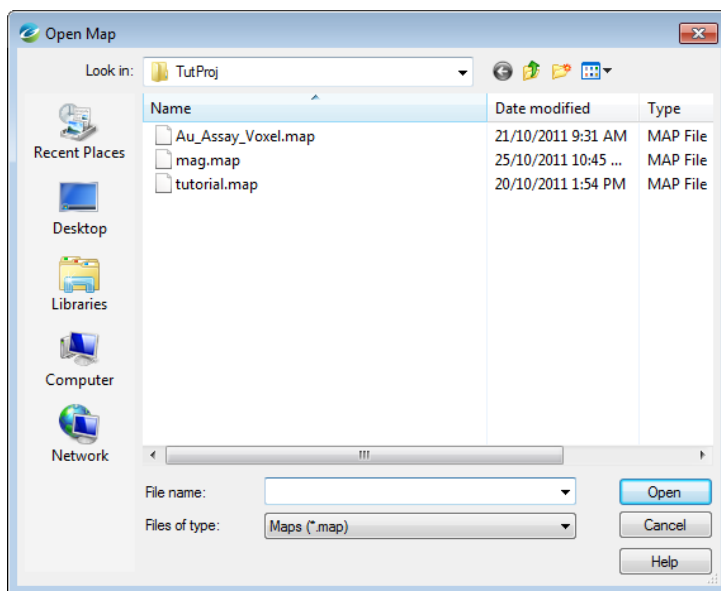
Displaying an Interpretation Map

In this section we will open a previously created map. For more information on creating maps in Target, see the *Target Surface Data Mapping* or *Drillhole Data Mapping* How-To Guides.

In order to edit a map, it must first be available in the *Project Explorer*.

To Open a Map

1. On the *Map* menu, select **Open map**.
The *Open Map* dialog box appears.



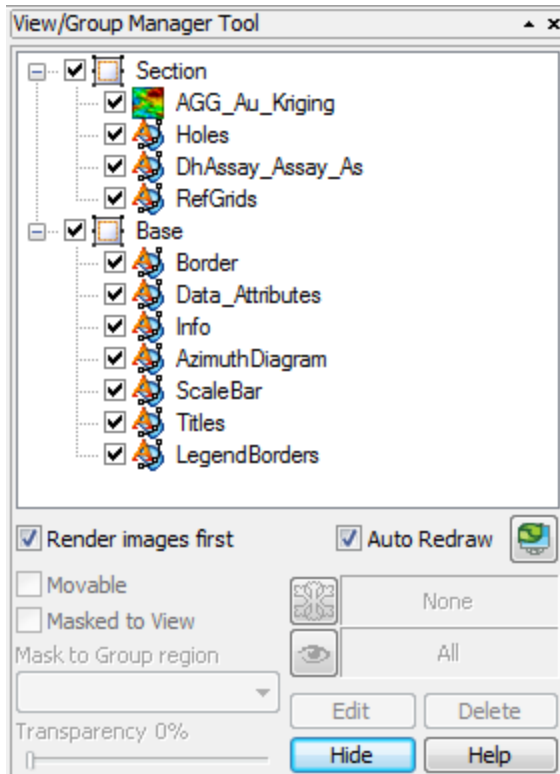
2. Select the map file in your project directory and click **Open**.
The map appears in the map window.

Map Groups

Map Groups organize map objects for display. You can use the *View/Group Manager Tool* to display and edit the views and groups in a map.

View/Group Manager Tool

This tool (see example below) consists of a 'tree' structure that contains branches representing the *Data* views and the *Base* views. Under each view, groups are listed according to their layer on the map.



Each group in a view shows an icon beside its name that identifies the group as either a map vector object or an aggregate object. Views can either be normal 2D views or 3D views.




 *The check box controls and indicates visibility of an item.*

To select a single item in the tree, click on the item desired. Multiple selections of groups within a view can be achieved by holding the **<Ctrl>** key and clicking on the desired items. Changing the selection during group editing will end group editing without cancelling any current changes.

The effect of a double-click on any item depends on the state of the map. If in shadow cursor mode, the map will switch to either group or view selection mode and select the item that was clicked upon. If the map is already in either of these selection modes, a double-click has the same effect as hitting the **Edit** button or using the activate shortcut key (default **<Enter>** key).

The group on the top layer (closest to the front) is listed first, followed by the next layer behind it, followed by the rest of the layers to the bottom layer at the end of the list. It is possible to control the render order in the tree by using the Drag-n-Drop technology. The Drag-n-Drop capability enables you to move map groups up and down within views and also to move views relative to each other.


Rendering Options

Render images first	Render (draw) the images groups first.
Auto-Redraw	Automatically redraw the map when a change is made to it.
 Redraw	Redraws the map when changes are made to the groups in the View/Group Manager and the Auto-Redraw option is off.
 Frozen Scale	Freezes the scale of the currently selected map group, independent of the view scale of the map. For example, when zooming in the text size in a group will not grow but remain the same size on the screen.
 Visible Scale	Scale range in which the currently selected group will be visible. For example, individual groups may be made visible only at specific scales. Then, while zooming, if the map scale is outside the range, the group is not drawn.

The *View/Group Manager Tool* is a “modeless” dialog, which means it can remain open while you work on your map. It can be toggled on or off using the “M” hot key and can even be docked on the side of your screen or at the top with the toolbars.

Other Tool Options

The other Tool options include moving, masking, transparency settings, editing and deleting.

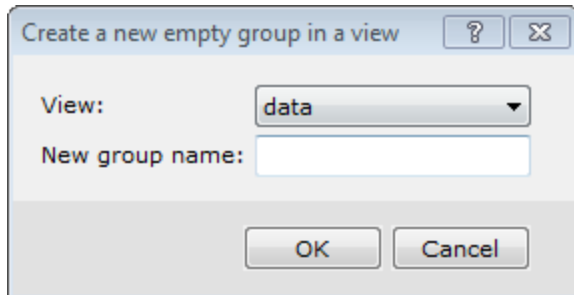
Moveable	Enables the movement of the selected group on the map using the cursor.
Masked to View	Masks the selected view using the mask applied to the view. This option enables you to apply a mask to selected groups within a view.
Mask to Group region	Select the extended view mask applied to the view. This option enables you to save the mask into the map and activate it on specific groups in the view.
Transparency	Enables the Transparency Slider (Transparent - Opaque). Move the slider to the transparency level wanted for the selected group.
Edit	Click to edit (or activate) the selected item.  <i>Double-click on a group or view in a map or using the activate shortcut key (default Enter key) to activate the edit mode for that item. The edit mode depends on the item; group edit mode for vector groups, colour tool for images and colour symbols and 3D Viewer for 3D views.</i>
Delete	Click to delete the selected View/Group. If you delete a group by mistake or make any other undesired changes, you can click the Undo last map change button on the Standard Toolbar or use the shortcut (default Ctrl-Z) at any time to undo any changes and revert to the original map.

Creating a New Group

The following procedure demonstrates how to create a new map group.

To Create a New Group

1. On the *Surface Mapping* menu, select *CAD Tools* and then select **New Group**.
The *Create a new empty group in a view* dialog appears.



2. From the **View** drop-down list, select the existing view in which to place the new group.
3. Specify the *New group name*.
4. Click **OK**. The new group is created and selected in your current map window and the *Map Group Editing Bar* is enabled.

Selecting and Editing Groups

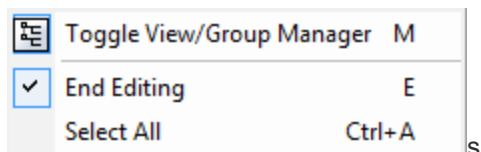
When you create a new group, this group becomes selected and you can edit it. A group is open for editing whenever you see the *Map Group Editing Bar* displayed.



Editing Using the View/Group Manager Tool

This tool provides a single dialog that enables you to switch between different groups, change their properties (moveable, hidden, masked), and change their layering order (move groups to the front or back).

1. Verify that *Map Group Mode* is selected.
2. On the *Map Tools Bar*, select **View/Group Manager**.
The *View/Group Manager Tool* is displayed. The currently selected group is highlighted. To switch to another group, click on the group name so that it becomes highlighted.
3. Click **Edit** and the group is selected in edit mode on your map and the *Map Group Editing Bar* is displayed.
4. When you are done editing the group, right-click and select **End Editing** from the pop-up menu.





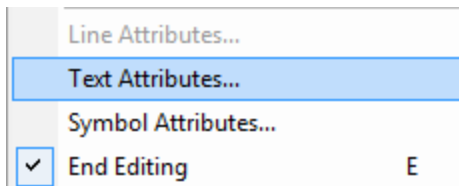
You can also edit groups using the Mapping pop-up menu. You may find this method quicker when you are editing and switching between groups frequently.

Editing Using the Pop-Up Menu

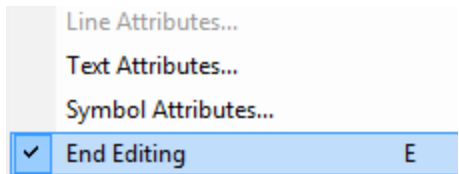
1. Verify that *Map Group Mode* is selected.
2. Right-click on the map and select **Groups** from the pop-up menu.



3. Select the name of the group you would like to select.
4. Right-click on the map again and select **Edit this group** from the pop-up menu. The group is selected in edit mode and the *Map Group Editing Bar* appears.
5. To edit Symbol or Text attributes, right-click again and select **Select All** from the pop-up menu. Then right-click again and from the pop-up menu, select to edit the *Attribute (Text or Symbol)*, as shown below.



6. When you are done editing the group, right-click and select **End Editing** from the pop-up menu.



Render Images

Check the *Render images* box to render (draw) the images groups first. This option is useful when you add an image to your map, and would like to draw this group first.

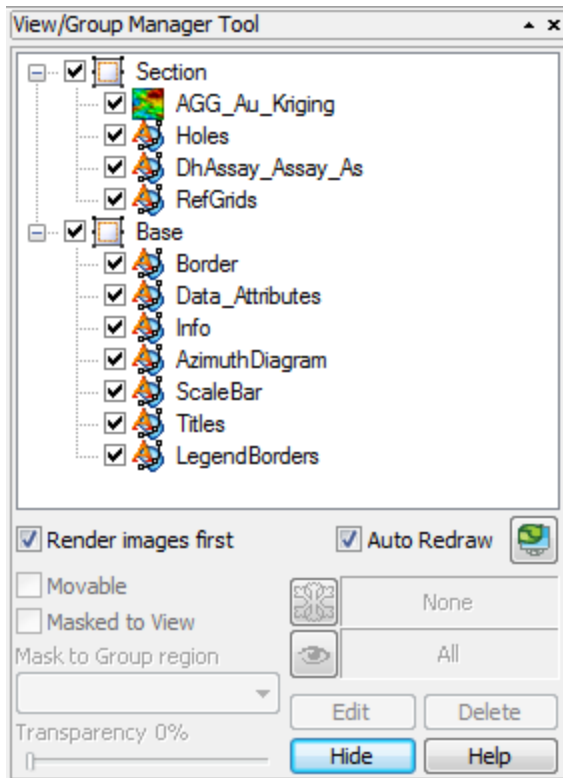
Hiding and Moving Map Groups

The procedures below demonstrate how to hide and move groups on a map.


To Hide a Group on a Map

When you have many groups on a map, you may not want to display all of them on your final map. The procedure below shows you how to hide a group on your map.

1. Verify that *Map Group Mode* is selected and then click **View/Group Manager**. The *View/Group Manager Tool* appears.



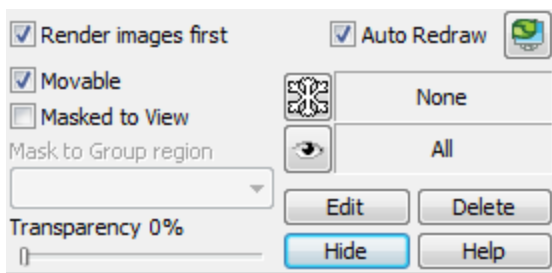
- 2.
3. In the *View/Group Manager Tool*, select (highlight) the group you want to hide.
4. Remove the check box from the box directly in front of the icon. The group is hidden.

 To display the group, add the check mark back again.

To Move a Group

To move a group around a map with your cursor, you must first select the **Movable** option for that group. Once this option is set, you can move the group by selecting it and moving it with the cursor.

1. From the *View/Group Manager Tool*, select (highlight) the name of the group.
2. Place a check in the *Movable* box (as shown below).





You can also click **Movable** from the pop-up menu.

3. Place the cursor anywhere inside the group on the map. The cursor will change into a set of directional arrows.
4. Click-and-drag the group in the direction you want to move it.

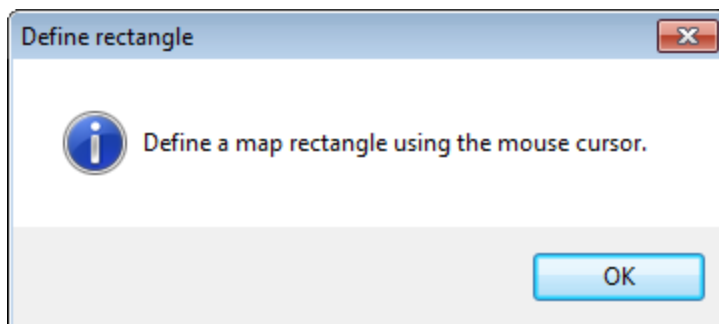
Masking a Group

Masking a group involves using a polygon or rectangular mask file to make only a specific area of a group visible. To mask a group, you must first create and apply a mask to a view. You can then use this mask on specific groups in the view areas of the group outside the mask. The following three procedures show you the steps to create a mask, apply it to a view, and turn masking on for a group.

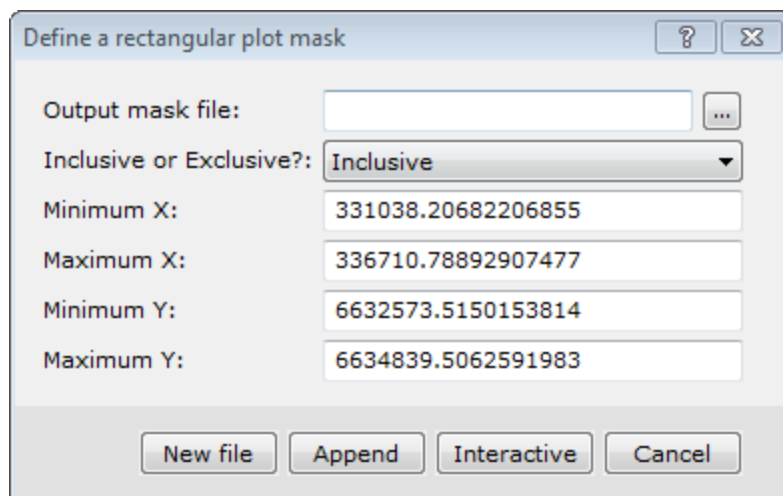
To Create a Rectangular PLY File

This procedure demonstrates interactive creation of a Rectangular PLY file. You can also create Polygon or Geographic PLY files. Please refer to the Application Help files for more information.

1. On the *Database Tools* menu, select **Window Data**.
2. Select **Create Rectangular PLY file**. The *Define a rectangular plot mask* dialog appears.
3. Click **Interactive**. The *Define rectangle* dialog box appears.



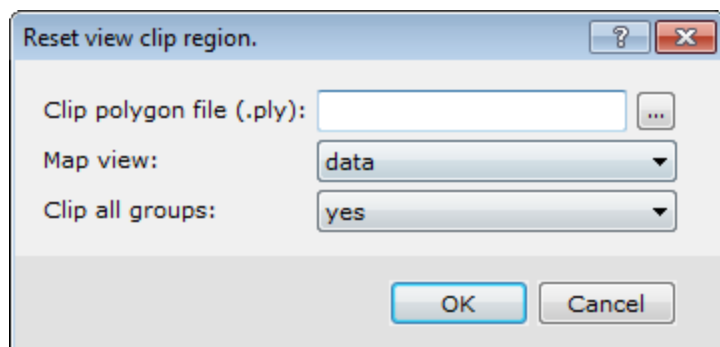
4. Click **OK** to continue.
5. Use the mouse to draw a rectangle on the map . The *Define a rectangular plot mask* dialog is then displayed with the coordinates of the rectangle, as shown in the example below.



6. Specify the *Output mask file*.
7. From the dropdown list select **Inclusive** or **Exclusive**. This determines what is visible when the mask is applied to a group. For example, if you select *Inclusive*, only features inside the rectangle mask will be visible.
8. Click **New File** to save the mask file. The file is saved.

To Apply a Mask to a View

1. On the *Map Tools* menu, select **Masking**.
2. Select *Apply View Mask*. The *Reset view clip region*. dialog appears.

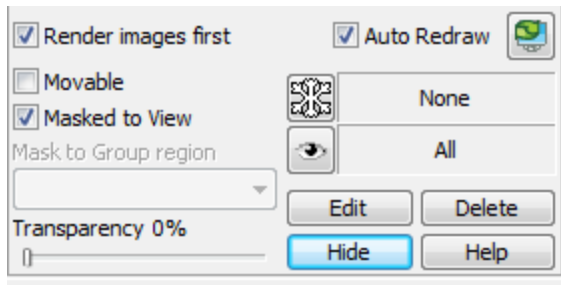


3. Browse to the *Clip polygon file* (*.ply) to apply.
4. From the dropdown list, select the *Map view* where the clip mask should be applied.
5. Select **yes** from the *Clip all groups* dropdown list to force all groups in the view to be clipped. Otherwise, select **no**.
6. Click **OK**. The mask is applied to the view.

To Mask a Group

1. Verify *Map Group Mode* is selected and select the map.
2. Click **View/Group Manager**.

3. Select (highlight) the group you want to mask.
4. Place a check mark in the *Masked to View* box (as shown below).



5. Click **Redraw**. The map is redrawn to display only the section of the grid inside the mask.





You can also turn Masking on or off by selecting a group in a map. On the *Map Tools* menu, select *Masking* and then select **Clear View Mask**. The mask will be cleared from the View.

Zoom In for Better Viewing Detail

The Zoom In option enables you to enlarge an area of interest for better viewing detail.

To Use the Zoom In Option

1. Click the **Zoom In** button () on the *Map Layout Bar*, or right click on the map and select **Zoom In** from the popup list.
2. Your cursor will turn into a crosshair (). Define a box by clicking the top left and bottom right corners of the area of interest. Then click once to execute the zoom command.
3. The system zooms into the defined area.

Lines, Poly-Lines and Polygons

You can use the line and the poly-line tools to draw linear features such as dykes and faults. You can then connect these lines and create shaded polygons to mark different geological or geophysical anomalies in your project area. This How-To Guide demonstrates several common poly-line and polygon procedures.



For detailed information on using the *Map Group Editing Bar*, please refer to the *Application Help files*.

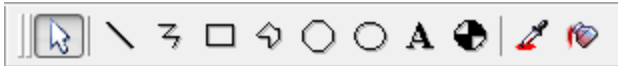
Drawing Poly-Lines

The procedure below shows you how to draw poly-lines on your map and how to create polygons from these lines.



A poly-line can change direction. Use the **Draw a Straight Line on Map** button to draw a straight line.

This procedure also shows you how to use the *Snap to point* and *Snap to line* tools, which are useful for ensuring that your lines connect each other without overlapping. The *Map Group Editing Bar* is used to create lines, polylines and polygons.

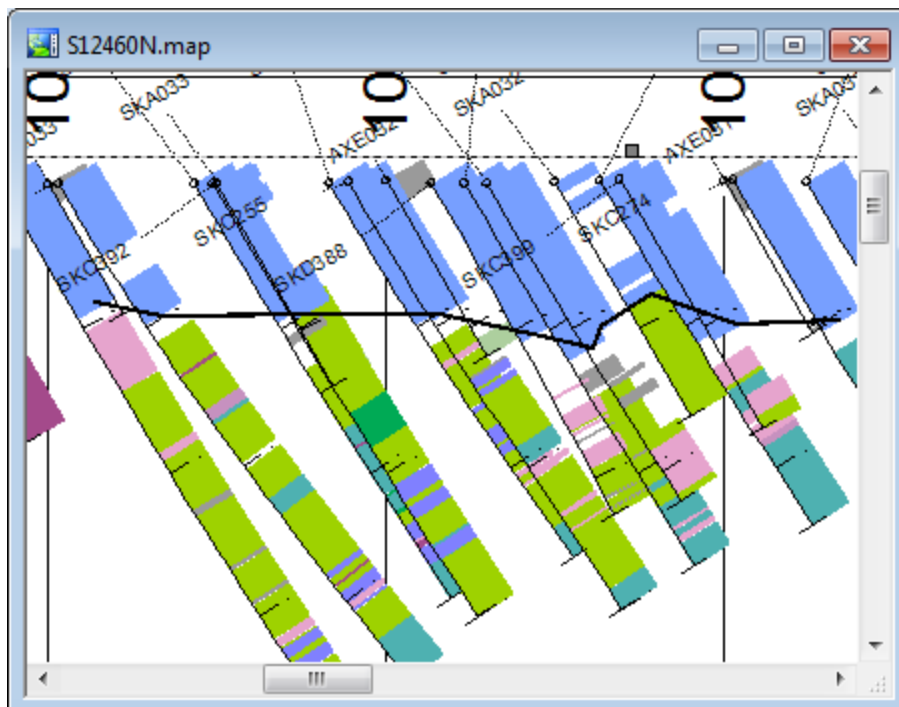


Drawing Poly-Lines to Identify Linear Features

1. Verify *Map Group Mode* is selected.
2. Right-click the map, and select **Groups** from the popup menu.



3. Select the group to be edited.
4. Right-click on the map and select **Edit This Group** from the popup menu. The *Map Group Editing Bar* is displayed.
5. On the *Map Group Editing Bar*, click **Draw a Poly-line on Map**.
6. Click the cursor on the place you want the line to start, and then move the mouse, clicking wherever you want to change direction.
7. When you are finished, right-click and select **Done** from the popup menu. The poly-line appears. An example of a poly-line is shown below.



Using Snap to Point and Snap to Line

You can connect poly-lines to create polygons.

1. Click **Draw a Poly-Line on Map**.
2. Right-click and select **Snap to Point** or **Snap to Line** from the popup menu. This determines whether the new poly-line begins from a location along the existing line or a point on the line.

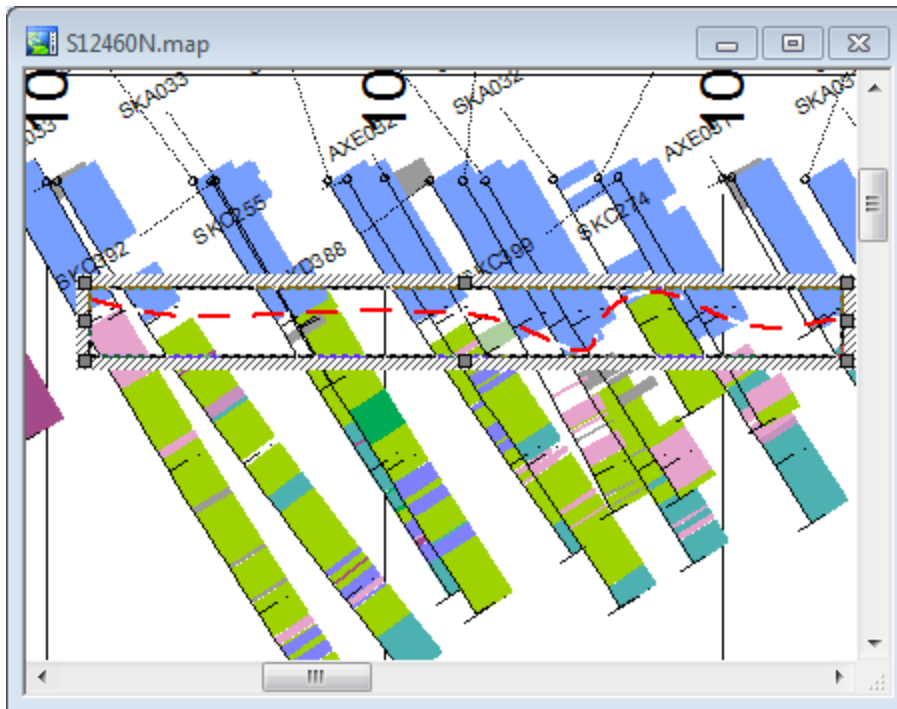


The cursor will change to a circle with a shaded centre. When you move the cursor over a point or node along the line, the cursor changes to a target symbol with the shaded circle indicating the location of the point.

3. Move the cursor and click-and-drag to define the shape of the line. Draw the poly-line(s) as desired.
4. When complete, right-click and select **Done** from the pop-up menu.
5. Click **Esc** to cancel the Snap To mode.

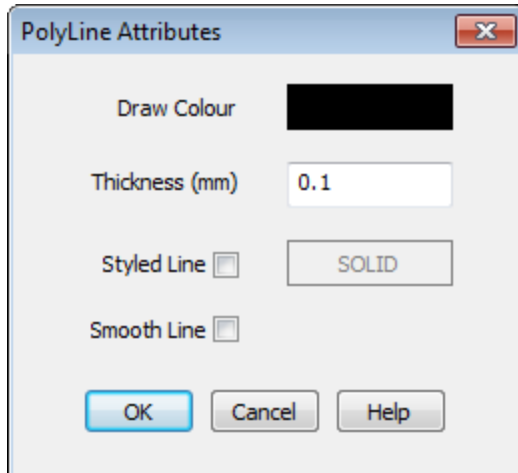
Changing Line Attributes

This procedure shows you how to modify the attributes (thickness, colour and pattern) of lines. An example is shown below.

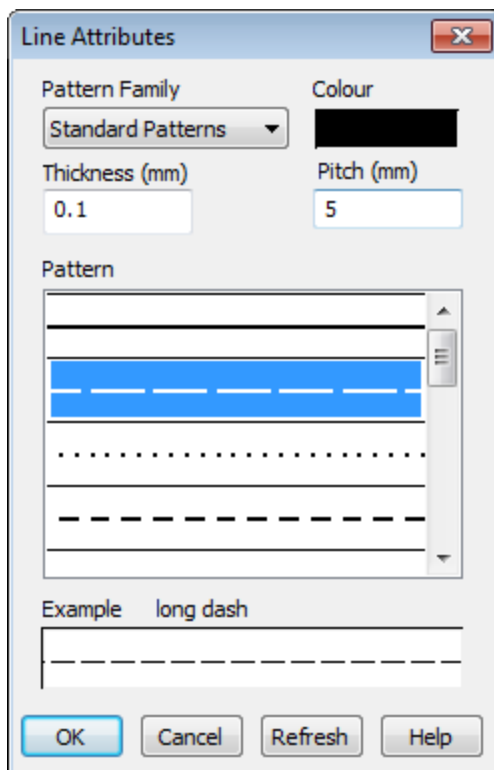


Changing Line Attributes

1. Left-click (select) the line you would like to edit. Sizing handles are displayed around the line, indicating it is selected.
2. Right-click and select **Attributes** from the pop-up menu. The *Polyline Attributes* dialog box appears.



3. In the *Thickness* box, you can specify the line thickness in millimetres (0.1 is the default).
4. To change the line colour, click on the **Draw Colour** box. A colour palette dialog box is displayed for you to choose a colour.
5. To change the line pattern, make sure there is a check mark in *Styled Line* check box. Double click in the *Styled Line* box to display the *Line Attributes* dialog box.



6. From the *Pattern Family* dropdown list, you can select from a variety of different sets of patterns for the line.
7. You can also set the *Pitch* (which is the distance between the symbols or dashes in the line) and the line *Thickness*.

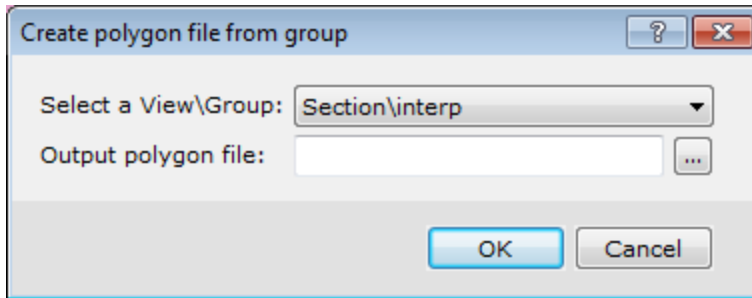
8. Click **OK** when you are finished.
9. Check **Smooth Line** to smooth the rough edges in the poly-line into smooth curves.
10. Click **OK** to apply the changes to the line or click **Cancel** to exit the dialog without making any changes.

Creating Polygons from Lines

After delineating different areas of your map with poly-lines and/or straight lines, you can use these lines to create polygons. This process will convert all the lines in the current group into polygons. If you have lines that you do not want converted to polygons either create these lines in a different group or ensure that the lines are not connected to other lines to create polygons.

To Create Polygons from Lines

1. On the *Surface Mapping* menu, select *CAD Tools* and then select **Get Polygons from Group**. The *Create polygon file from group* dialog appears.

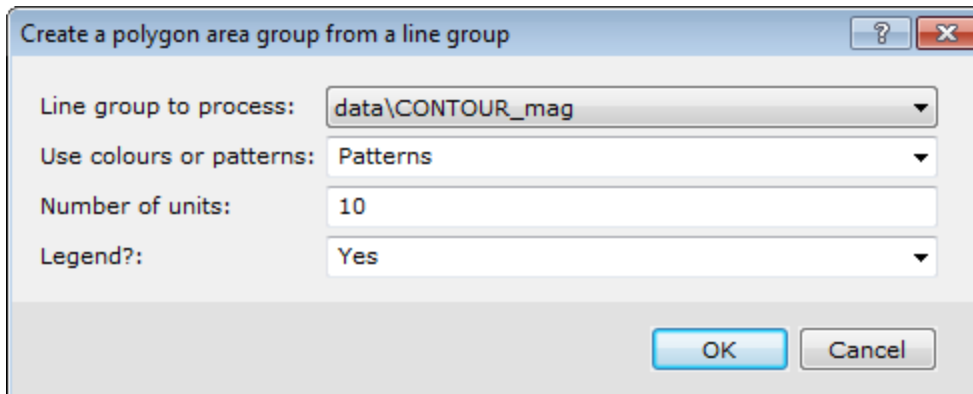


2. From the *Select a View\Group* dropdown list, select the View or Group to convert to polygons.
3. Specify the *Output polygon file*.
4. Click **OK** to create a polygon file from your lines in the selected group.

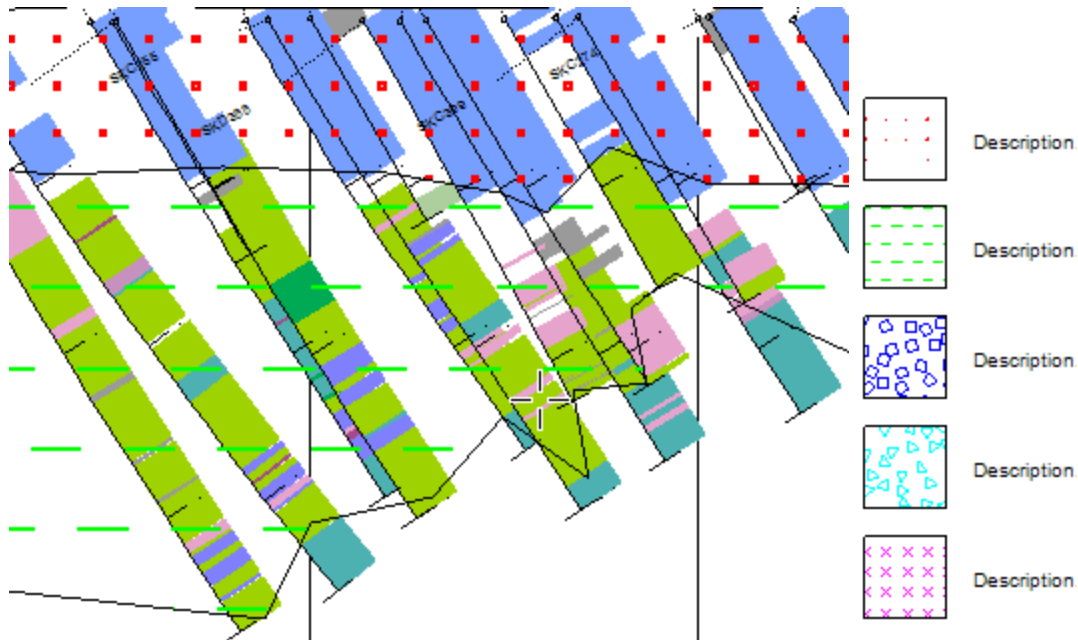
Creating Polygon Fills

You can create fills for the closed polygons you created above.

1. On the *Map Tools* menu, select **Create Fills for Closed Polylines**. The *Create a polygon area group from a line group* dialog appears.



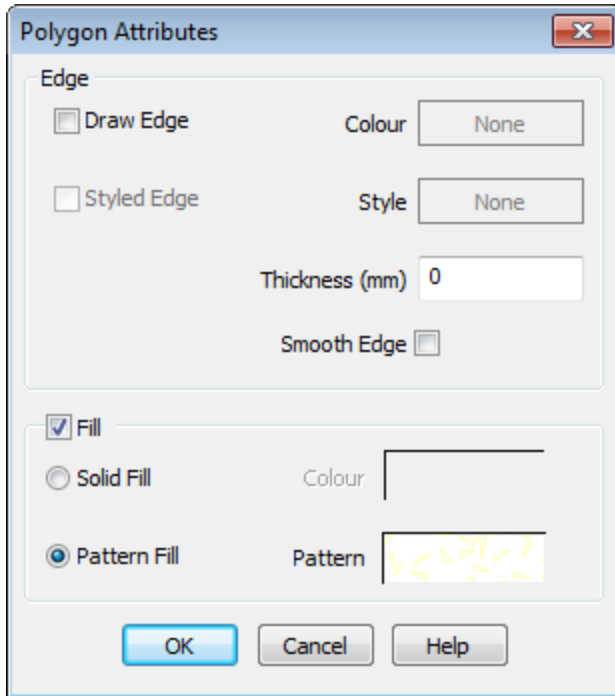
2. Use the **Line group to process** dropdown list to select the group of lines that you want to convert to polygons.
3. The **Use colours or patterns** dropdown list has three options for shading polygons: *Colours*, *Patterns* or *Both*.
4. The *Number of units* indicates the number of boxes of categories you want to create in the legend. The default is 10. You can edit these boxes later.
5. Select *Yes* if you wish to add a legend to the map.
6. Click **OK** to continue.
7. Specify the legend settings in the *Legend* dialog, if you are adding a legend.
8. Click **OK** to create polygons and a legend similar to the map below.



Editing Polygons and Legend Boxes

You can edit both polygons and their associated legend boxes in the same way.

1. Verify *Map Group Mode* is selected.
2. Double-click the polygon or box you want to edit. The *Polygon Attributes* dialog appears.



3. To change the line colour, click the Edge **Colour** box. A colour palette dialog box is displayed for you to choose a colour. To turn line colouring off (i.e. make the line invisible) remove the check mark from the *Draw Edge* check box.
4. You can select a line pattern and/or colour using the *Styled Edge* and *Style* boxes.
5. To display a polygon fill, check the **Fill** check box.
6. You can select a **Solid Fill** colour by selecting the radio button and choosing a colour using the *Colour* palette.
7. Select **Pattern Fill** to display the *Pattern Attributes* dialog and select a pattern fill and colour.
8. You can also set the *Tile Size* and *Tile Density*, which changes the space between the pattern symbols and the Line Thickness (% of Tile Size), which changes the size of the individual pattern symbols.



Click **Refresh** to see what the pattern will look like in the example box.

9. Click **OK** when you are finished selecting polygon attributes to apply the changes or *Cancel* to exit the dialog without making any changes.

Using the Polygon Attributes Tool

Using the *Get Polygon Attributes* tool (eyedropper) and the *Apply Polygon Attributes* tool (bucket) on the *Map Group Editing Bar*, you can copy fill colours and patterns from one polygon and apply them to another polygon.

Get Polygon Attributes

	The image cursor changes to an eyedropper.
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Apply Polygon Attributes



The image cursor changes to a bucket.

To Copy Polygon Attributes from one Polygon to Another













1. Click the **Get Colour** button on the *Map Group Editing Bar*. The image cursor will change to an eyedropper.
2. To get a colour (and pattern) from a polygon, click with the eyedropper on the polygon containing the colour you want to copy. The cursor will change to a bucket.
3. Click on the polygon to which you want to apply the fill. The polygon now contains the new colour (and pattern).

Polygon Edit Tools

A *Polygon Edit* toolbar is provided with Oasis montaj. These tools enable you to edit polygon vertices, add exclusion regions to polygons, and switch between editing the vertices of main polygons (*Islands*) and vertices of the exclusion regions polygons (*Holes*).



Attributes...		Edit Vertices
<input checked="" type="checkbox"/>	End Group Editing E	
<input type="checkbox"/>	Edit Vertices... N	The Edit Vertices option is available on the <i>Map Edit</i> pop-up menu when you are in Group Edit mode and have a polygon selected on your current map.
<input type="checkbox"/>	Add Vertices... Num +	
<input type="checkbox"/>	Delete Vertices... Num -	
	Render Order ▶	
	Nudge ▶	
	Delete Del	

Polygon Edit Tools	Description
 Edit Vertices	Edits the vertices of a previously created polygon.
 Add Vertices	Adds new vertices to a polygon.
 Delete Vertices	Deletes vertices from a polygon.
 Add New Rectangular Island	Add a new rectangular “Island” to a previously created polygon.
 Add New Polygon Island	Adds a new polygon “Island” to a previously created polygon.
 Add New N-Sided Polygon Island	Draws a new N-sided polygon “Island” to a previously created polygon.
 Add New Rectangular Hole	Adds a new rectangular “Hole” to a previously created polygon “Island”.
 Add New Polygon Hole	Adds a new polygon “Hole” to a previously created polygon “Island”.
 Add New N-Sided Polygon Hole	Draws a new N-sided polygon “Hole” to a previously created polygon “Island”.
 Cycle to Previous Hole/Island	Cycles (switch) to the previous Hole or Island.
 Cycle to Next Hole/Island	Cycles (switch) to the next Hole or Island.
 Delete Current Hole/Island	Deletes the current Hole or Island.

Add/Remove Vertices on a Polygon

Vertices can be added or removed from polygons by using the plus (+) and minus (-) keys on your **Number Keypad**.



The plus (+) and minus (-) keys on the main alpha-numeric keypad will not work; you **MUST** use the **Number Keypad** only.

To Access the Edit Polygon Vertices Option

1. Click **Map Group Mode**.
2. Select the group on your map that includes the polygon you wish to edit.
3. While holding your cursor over your map, right click and select **Edit This Group** from the pop-up menu. The group will now be in *Edit* mode (you will see a box with hatch marks around the group, this is a visual clue that you are in Edit mode).
4. Select the polygon to edit.
5. Right-click and select **Edit Vertices** from the pop-up menu. The vertices on your map will change from grey to white.

To Add Additional Vertices on a Polygon

1. While in *Edit* mode, select **Edit Vertices** from the pop-up menu.
2. Place your cursor, between two vertices on the polygon, where you want to place the new vertice(s).
3. Press and hold the "+" key on your **Number Keypad**. A plus sign is added to your cursor.
4. While holding down the "+" key, use your mouse to select the location for the new vertice(s).



You can also select **Add Vertices** from the Polygon Edit Bar. Your cursor will change to a cross-hair and it will be linked to the polygon lines. Left-click to add new vertices to the polygon.

To Remove Vertices from a Polygon

1. While in *Edit* mode, select **Edit Vertices** from the pop-up menu.
2. Place your cursor on the vertice(s) you want removed.
3. Press and hold the "-" key on your **Number Keypad**. A vertices selection box and a minus sign are added to your cursor.
4. While holding down the "-" key, use your mouse to select the vertices to be removed.



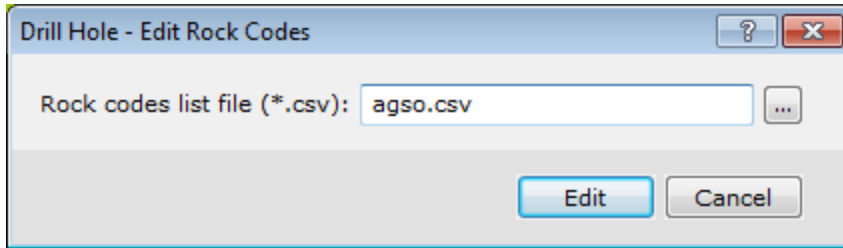
You can also select the **Delete Vertices** button from the Polygon Edit Bar. Your cursor will change to a vertices selection box with a minus sign added. Left-click to delete vertice(s) from the polygon.

Creating and Editing Rock Code Files

Rock codes and their associated patterns are usually used with From-To data to display pattern fills on maps. You can use the editing tool to edit the rock codes in an existing file or to create a new file

To Create a New Rock Code File:

1. On the *DH-Plot* menu, select **Edit Rock Codes**.
The *Drill-Hole - Edit Rock Codes* dialog appears. Note that the default rock code file "agso.csv" will be displayed, or the rock code file that was last used in your drillhole project.



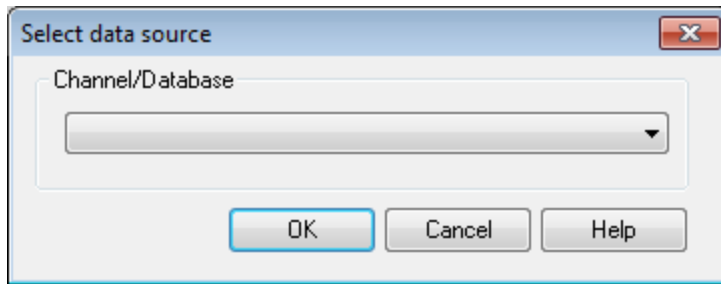
You can set the default rock code file at anytime by using the Preferences option on the DH-Data menu.

2. For the *Rock codes list file (*.csv)*, enter a file name for your new rock code file. This will create a new rock code file .csv file. You can also open and edit an existing rock code file from this dialog.
3. Click **Edit**. The *Edit Rock Codes* dialog appears.



4. Click **Populate from channel**.

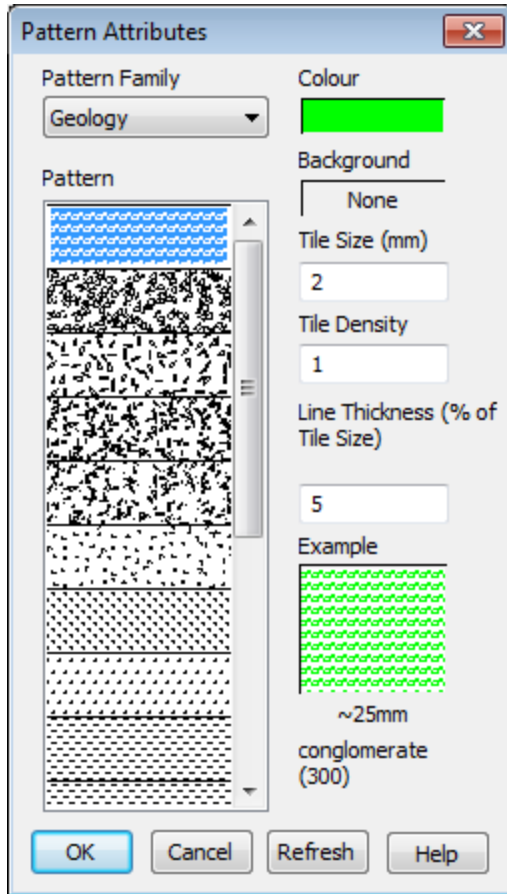
The select data source dialog appears. This dialog enables you to select a current database channel from which the rock code file will be automatically updated.



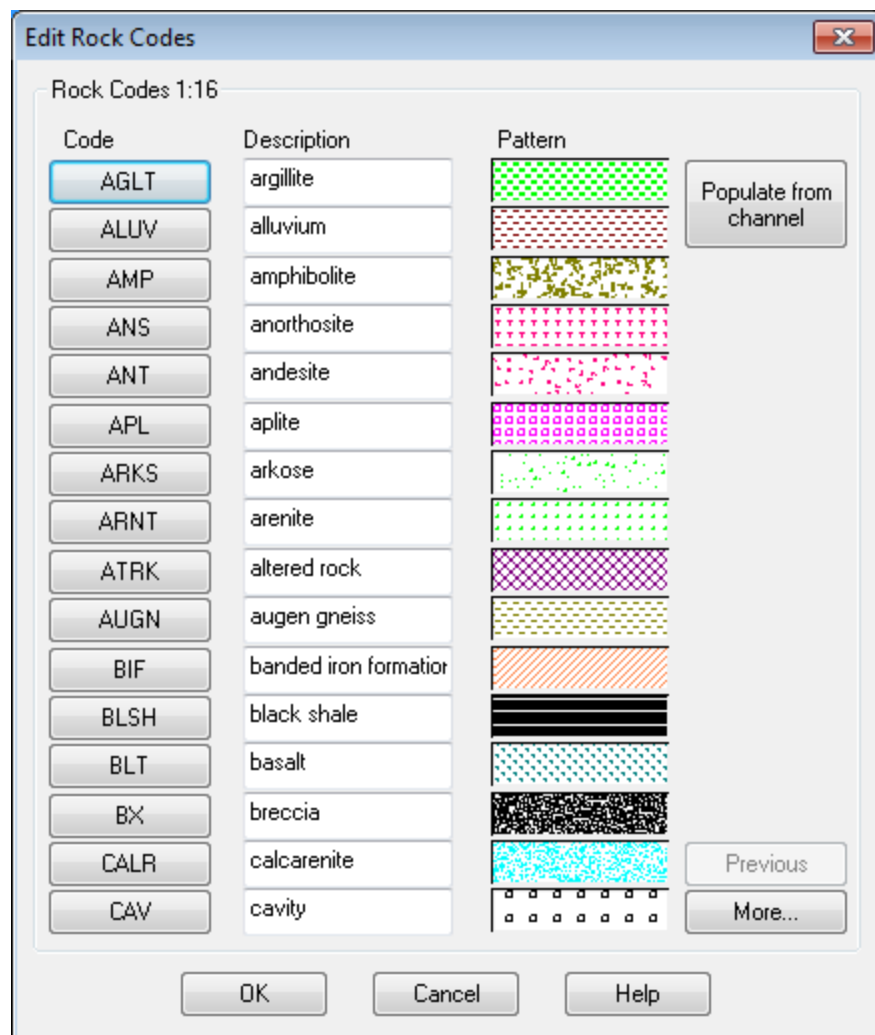
5. From the *Channel/Database* dropdown list, select your desired channel and click **OK**.
6. A message window opens indicating that there are new items to import into the rock code file. Click **Yes**.
The *Edit Rock Codes* dialog box is now populated with the codes from your chosen channel within your From-To database.

To Edit Individual Rock Codes

1. In the Edit Rock Codes dialog click in the *Description* box beside a rock code to provide a short description of the rock type.
2. Click in the **Pattern** box beside a rock code to edit its colour and/or pattern.
The *Pattern Attributes* dialog appears. You can use this dialog to select the Pattern Family, Pattern, Colour, Background Colour, Tile Size, Tile Density and Line Thickness.



3. Select a pattern type via the *Pattern Family* dropdown menu.
4. Click in the **Colour** box to change the colour of the pattern.
5. The size and density of the pattern shapes can be set via the *Tile Size* and *Tile Density* boxes.
6. The *Example* pane shows you how your rock code pattern will look as you change the above parameters.
7. Once you are satisfied with the pattern for the rock code click **OK** to save it and the system will return you to the *Edit Rock Codes* dialog.



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