

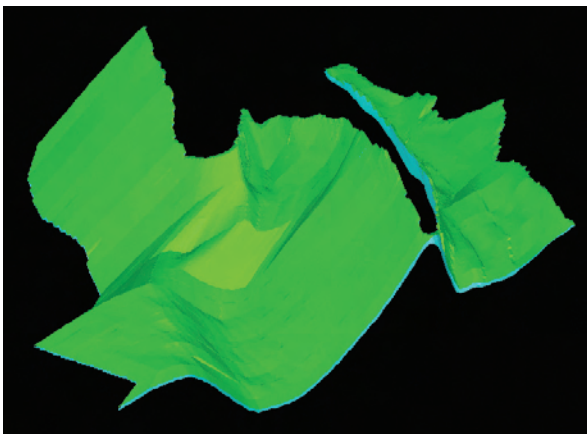
# TIPS

from



## Tech Support

# Extracting Surfaces from Solids Using the LGO Tool



### Background

A Large Gridded Object (LGO) file is a file that is used to store and manipulate large surfaces or solids. LGO files are based in the same concept as the Gridded Surface File. An LGO file stores elevation and optional thickness values at centers of a grid. The grid information is stored in the LGO file. There is virtually no limit to the number of blocks in a grid (grid is limited by 2 billion x 2 billion nodes).


### General

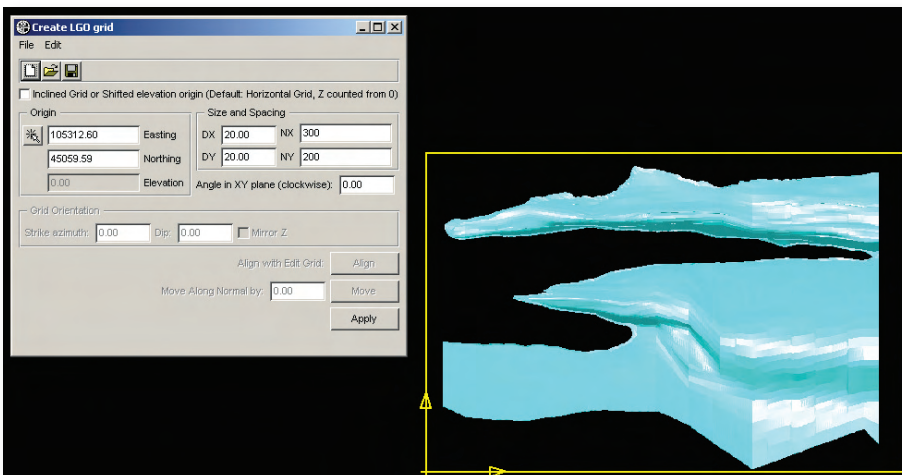
The LGO is a very versatile and efficient tool to use when working with large surfaces or solids that typically take a significant amount of time to manipulate using standard

MineSight® tools and functions. The LGO can also be used to extract the upper and lower surfaces from a solid representing the top and bottom surfaces of a coal seam or other mineralized material. The following example will detail how to do this in three simple steps. These steps are:

1. Creating the LGO file
2. Select the Solid and Extract the surfaces
3. Surface verification

### Step 1: Creating the LGO file

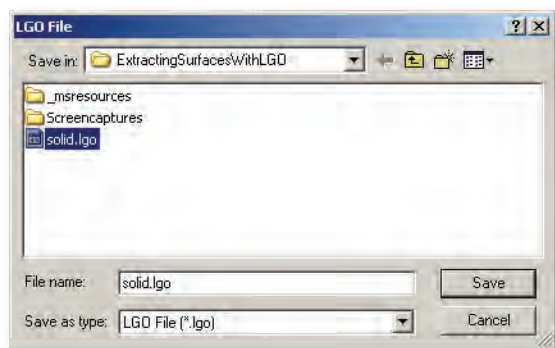
To create the LGO from within MineSight® 3-D (MS3D), go to **File | Create LGO**. Specify the start point of the LGO grid by either entering the Easting, Northing, and Elevation coordinates or use the **Pick** button .



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(Extracting Surfaces from Solids Using the LGO Tool continued from page 7)

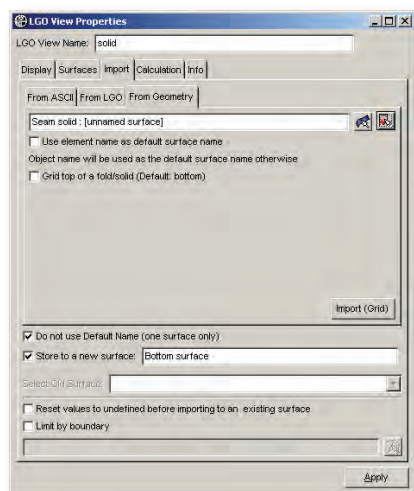
The DX and DY values correspond to the grid cell size (the smaller the size, the greater the accuracy and larger the LGO file and vice-versa) whereas the NX and NY values correspond to the number of grid cells in the X and Y direction, respectively. Enter the desired DX and DY values and the appropriate NX and NY values and then click the **Apply** button to verify the yellow rectangle (which represents the grid area) encompasses the entire surface or solid as shown. To save the LGO file, go to either **File | Save** or click the **Save** button, enter a name and click **Save**.



## Step 2: Select the Solid and Extract the Surfaces

In order to use our LGO file, we need to create an LGO View within MS3D. To do this, select a folder within the **Data Manager**, click right and select **New | LGO View**, enter a name, select the previously created LGO file (\*.lgo), and click **OK**.

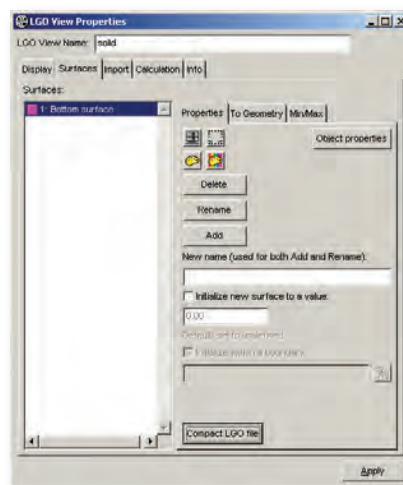
Select the solid to be used by opening the **LGO View Properties** dialog and going to the **Import** tab and select the **From Geometry** tab. Using either the **Pick Surface** button  or the **OCB** button  select the desired solid.



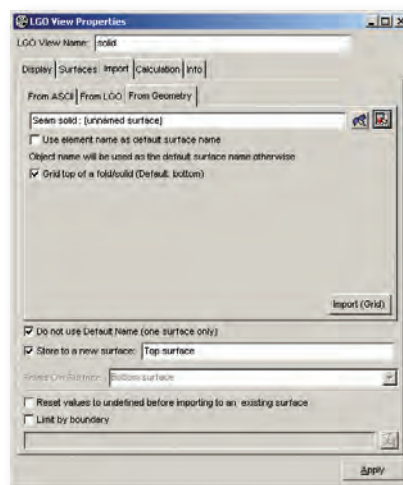
To extract the bottom surface from the solid simply check the **Do not use Default Name** and **Store to a new surface** boxes using Bottom surface as the new surface name and click **Import (Grid)**.

**NOTE:** This option only stores the lowest elevation

of the solid at each grid center. Thus, only the lower part of the solid in an over-thrust area is stored.



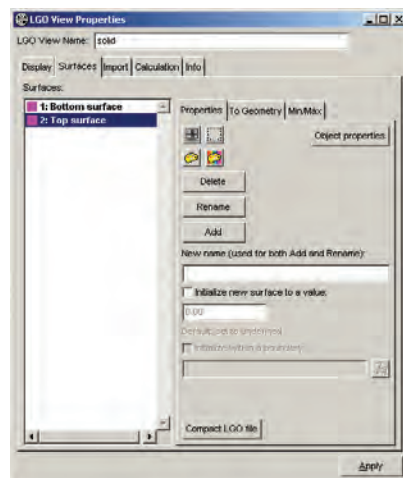
To verify that the bottom surface of the solid was imported into the LGO, go to the **Surfaces** tab and see it listed under **Surfaces** as shown.



Extract the top surface of the solid by going to the **Import | From Geometry** tab, checking the **Grid top of a fold/solid box** and change the **Store to a new surface name to Top Surface** and click **Import (Grid)**.

**NOTE:** This option only stores the highest elevation of the solid at each grid center.

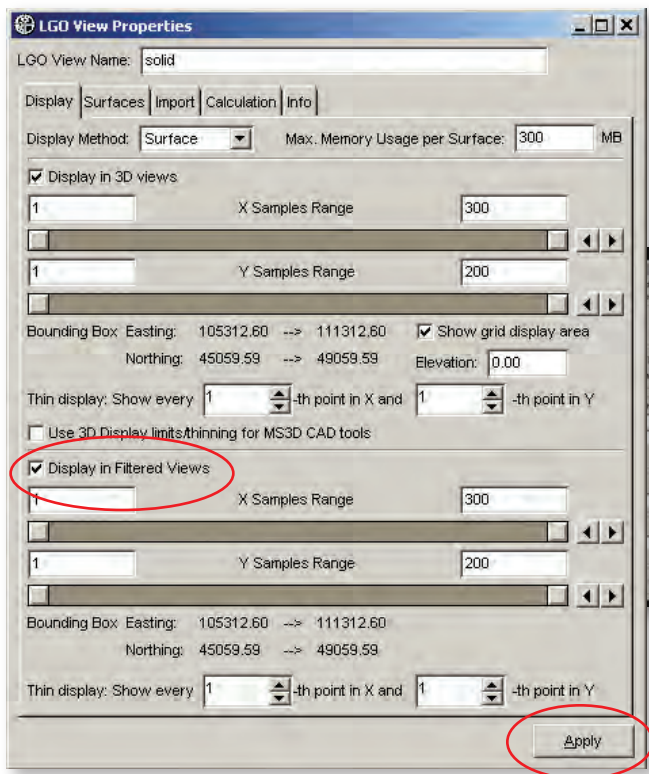
Thus, only the higher part of the solid in an over-thrust area is stored.



Verify that the top surface was imported by going to the **Surfaces** tab.

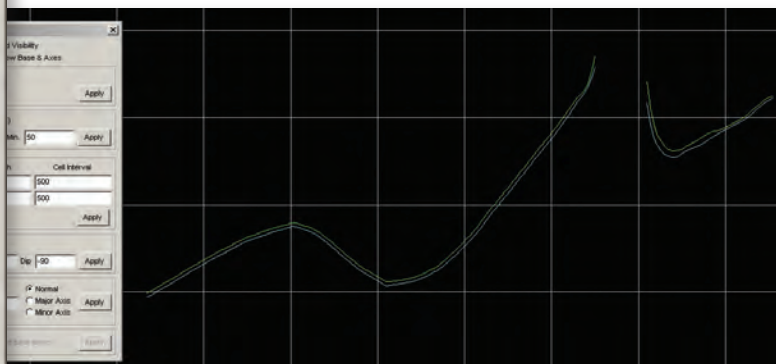
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(Extracting Surfaces from Solids Using the LGO Tool continued from page 8)



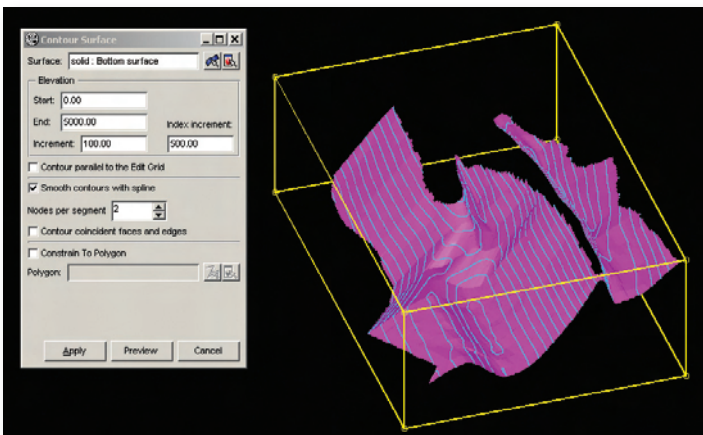
### Step 3: Surface verification

To see the created surfaces in 2-D, go to the **LGO View Properties | Display** tab and check the Display in Filtered Views box, maximize the X and Y Samples Ranges and click **Apply**. Attach an appropriate **Grid Set** or **Edit Grid** to the viewer and switch to 2-D viewing mode.

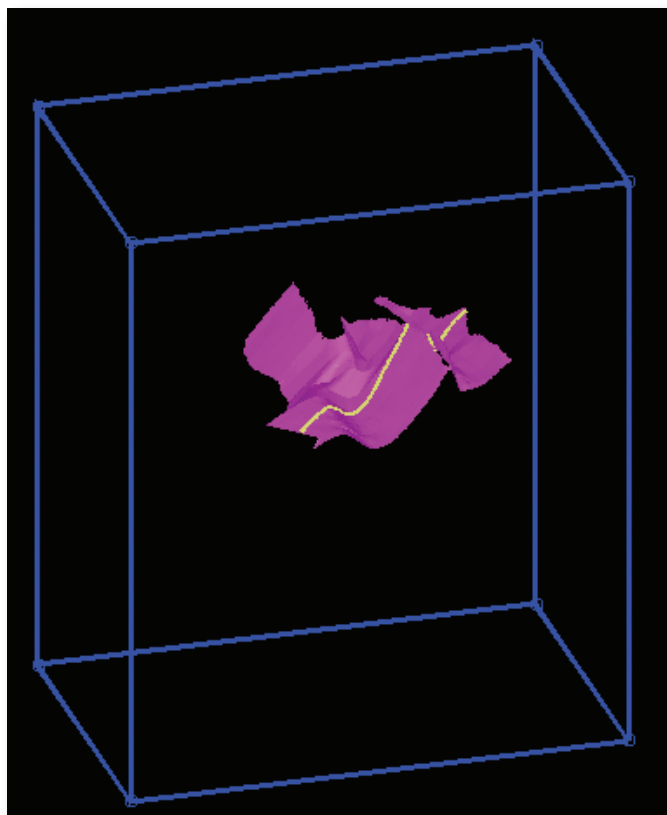


### Using the Surfaces

The LGO surfaces may be used with many of the surface functions within MS3D, such as **Polyline | Contour Surface** or **Surface | Intersect Surfaces**. These examples are shown below.




Contouring an LGO Surface

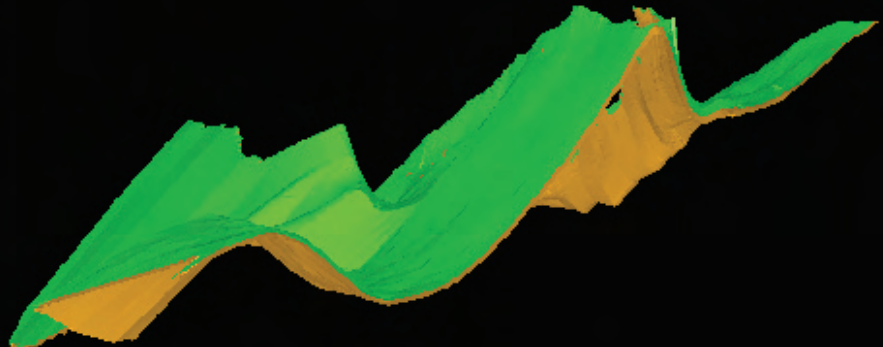
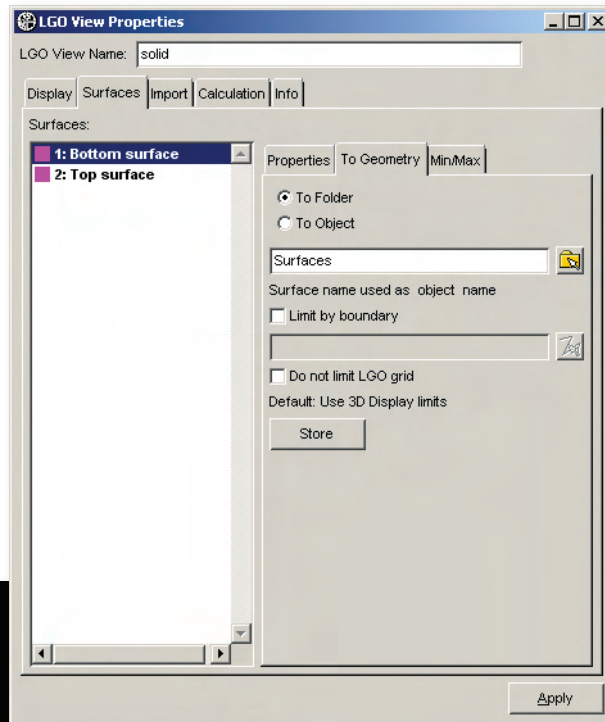


The gold line representing the intersection of an LGO surface (shown) and a vertical planar surface (not shown).

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(Extracting Surfaces from Solids Using the LGO Tool continued from page 9)

The top and bottom surfaces may also be exported to geometry objects by going to the **Surfaces | To Geometry** tab. Select one of the listed surfaces or multiple surfaces by pressing and holding the left mouse button while dragging. Select either the **To Folder** or **To Object** option using the yellow Browse folder  to pick the desired Folder or Geometry Object and click **Store**.



## Conclusion

The LGO is an excellent tool that can be used to manipulate large surfaces and solids. In addition, it is also useful for calculating the elevation difference or thickness between two surfaces or splitting a solid into upper and lower surfaces. If you have further questions about extracting surfaces from solids using the LGO tool, please contact Mintec Technical Support at [ts@mintec.com](mailto:ts@mintec.com).