



*DEM CuePac
User Guide Version 2020
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ISV/Software Solutions

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About this Document

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1 Introduction

The Digital Elevation Modeling CuePac (DEM CuePac) is a collection of processing modules, GeoCue *Entity* definitions and Checklist steps that provide a number of functions related to transforming, analyzing and processing digital elevation data in a variety of formats.

This version of the CuePac exposes a limited subset of the eventual functions of the DEM CuePac. This subset includes:

- Defining a layer of DGN_Products (these products are, in this initial version, restricted to being a ‘clone’ of a Working Segment layer as created in LIDAR 1 CuePac)
- Assigning a processing *filter* to the entities on the Product layer that specifies which LAS points are to be populated. The filter operates on Return, Class, Source ID, and Flag Attributes (see the ASPRS LAS specification)
- Generation of DGN elevation files – Conversion of LAS points to DGN elements
- MicroStation invocation with adjacent elevation tiles.
- Import of various elevation formats with conversion to LAS format
- Merge
- Extract
- Creation of ERDAS IMG format output elevation files
- Creation of Intergraph TTN format output elevation files

2 Creating DGN Products

DGN Products consist of a collection of polygon entities with associated MicroStation Design (DGN) files. The files are populated with point cloud elevation data that originated in LAS format files. The points are represented in the DGN file as zero length lines.

NOTE – DGN_Products are created from populated LIDAR 1 Working Segments. In this document we assume that you have already created a LIDAR project with LIDAR working segments and that the working segments have been populated.

CAUTION – MicroStation can handle, from a practical point of view, no more than a half a million points or so. You should therefore size your LIDAR working segments such that the number of points that will transfer to your DGN_Products is within this range. Remember two additional factors when sizing your LIDAR working segments:

1. If you are processing the LIDAR points with a LAS 1.0 tool (such as TerraScan) to classify a subset of data, you will be able to use the classification tag to *filter* the points when you generate the DGN_Products using the DEM CuePac. Thus you will not need to pre-thin the data.
2. If you are using a LAS 1.1 compliant tool, you will be able to filter on the point type flags (Synthetic, Key-point and Withheld) in addition to the Classification attribute.

2.1 Creating the Layer and Entities

The first step in the DGN elevation workflow is to create an Elevation Product layer as well as the associated Product Entities. In this release of DEM CuePac, both operations occur via a single command. Prior to creating the DGN Files products, working segments must be created and populated via LIDAR 1 CuePac. This is illustrated in Figure 2-1.

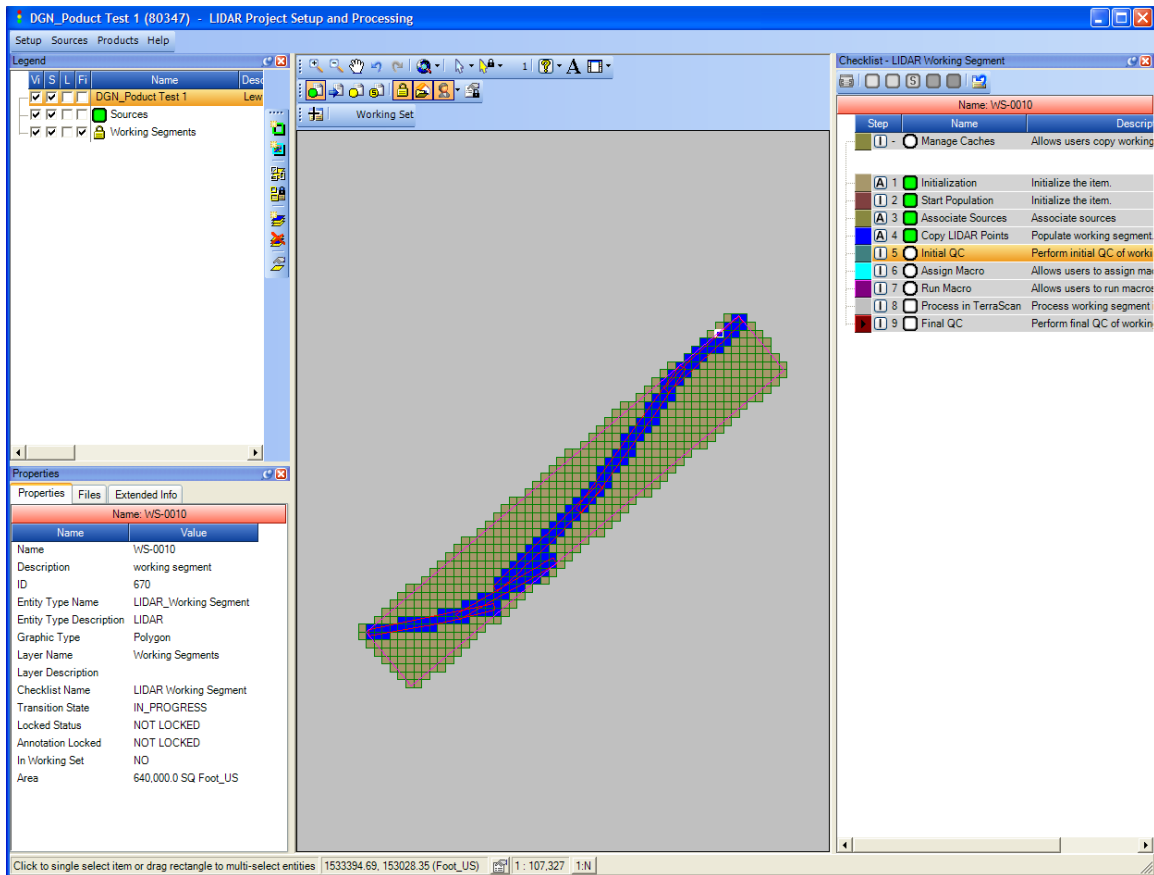


Figure 2-1 Populated Working Segments in LIDAR 1 CuePac

The creation of the DGN Products layer and entities is realized via the new command on the drop-down menus:

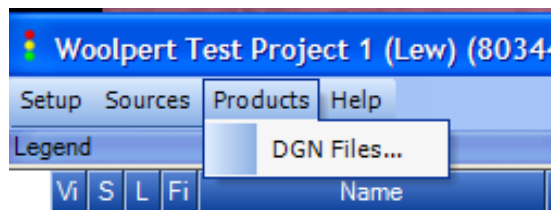


Figure 2-2 DGN Files creation command

Note: When you select commands for the first time following a new installation of GeoCue and CuePacs, you may be presented with the dialog of Figure 2-3 when executing commands. Simply select **Unblock** if you receive this dialog.

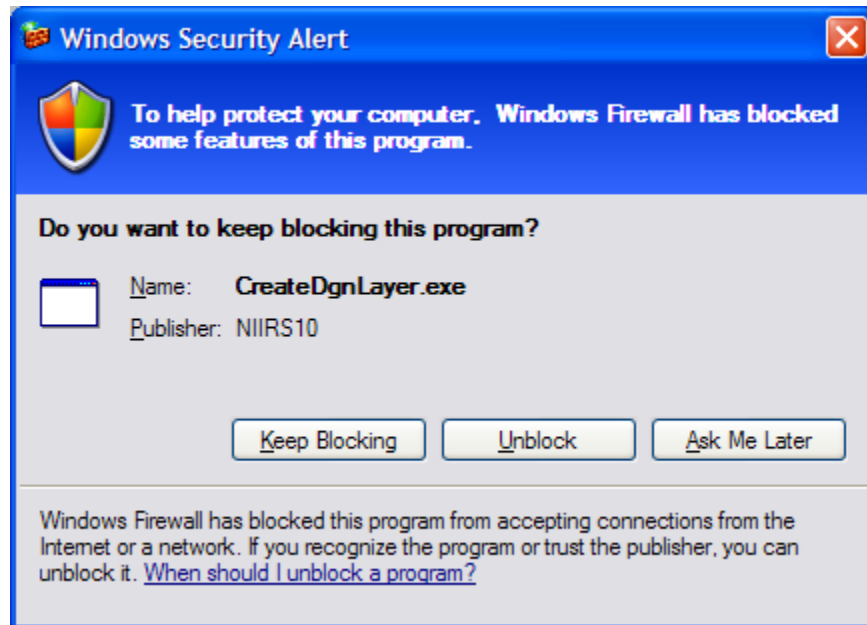


Figure 2-3 Windows Security Alert

After selecting *DGN Files...* from the *Products* top-level menu, you will be presented with the dialog of Figure 2-4. This dialog is used to create both a new DEM Product layer for hosting the DGN File entities and the entities themselves.

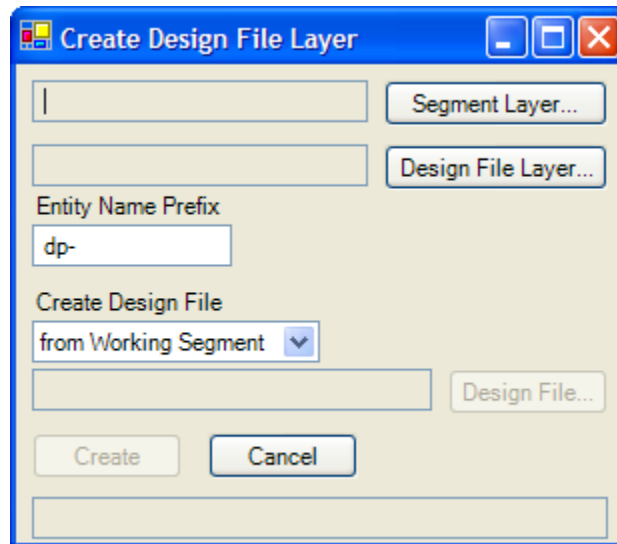


Figure 2-4 Create Design File Layer command

Choose the LIDAR Working Segment layer that will serve as the source for the DGN files using the *Segment Layer...* selection on the dialog. Upon pressing this button, you

will be presented the familiar GeoCue *Select Layer* dialog illustrated in Figure 2-5. The *Select Layer* dialog will pre-filter the presented layers to show only LIDAR working segment layers. Select from the list the layer that contains the working segments that will serve as the sources for your DGN files.

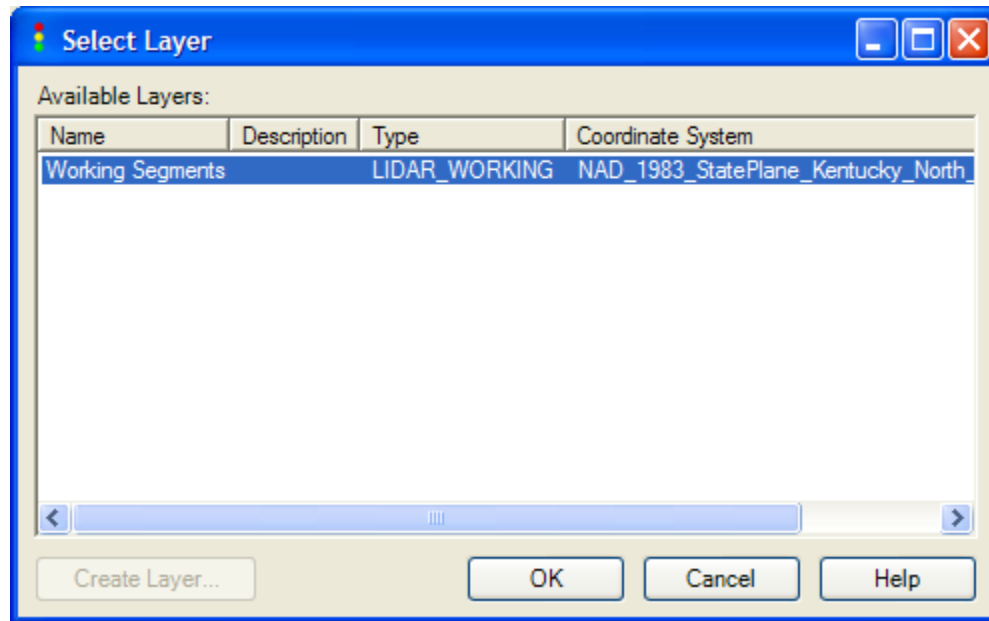


Figure 2-5 GeoCue *Select Layer* dialog

The next step is to create the layer that will contain the DGN Entities. Press the *Design File Layer...* button on the *Create Design File Layer* dialog. This will again bring up the GeoCue *Select Layer* dialog. If you have not previously created a Layer of type DGN_PRODUCT (the layer type required for the DGN_Product entities), the *Select Layer* dialog will be empty (Figure 2-6) since there are no layers of type DGN_PRODUCT present in the project. Press the *Create Layer...* button to bring up the GeoCue *Create Layer* dialog (Figure 2-7). Note that the Layer Type has been preset to **DGN_PRODUCT** and that this layer type cannot be changed (you can only place DGN_Product Entities on a DGN_PRODUCT layer). Type in the name you wish to assign to the layer and, optionally, a description (these can always be changed later via the Layer Properties dialog).

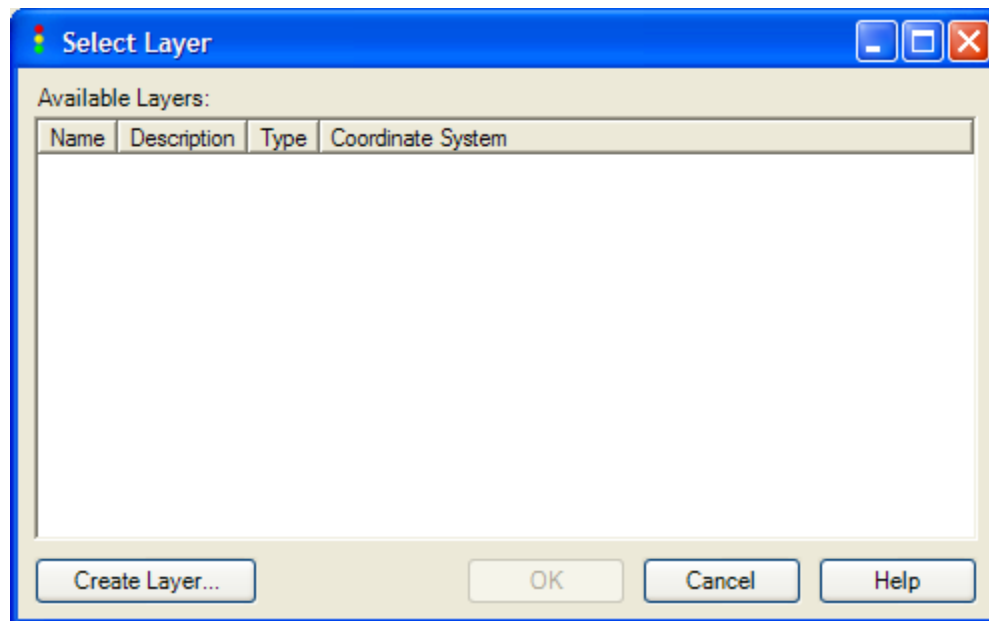


Figure 2-6 *Select Layer* with no suitable layers available

Next select the layer coordinate system (if it is to be other than the default).

The DEM CuePac DGN_PRODUCT population algorithm can perform coordinate transformations as it creates the DGN file. Therefore you can select a DGN_PRODUCT coordinate system that differs from the LIDAR Working Segment coordinate system.

This prerelease version supports changes in the horizontal coordinate system. Version 1.7 will add Vertical transformation support.

The final step is to select the warehouse where you would like the data that will be associated with layer entities to be stored. You can also set the amount of storage to reserve if desired (see the GeoCue guide for detailed information on managing GeoCue Warehouses). An example of a populated *Create Layer* dialog is depicted in Figure 2-8. Note that we have selected a coordinate system that is different from the coordinate system of the source LIDAR Working Segment layer. The coordinates of the LAS points will be transformed to the DGN_PRODUCT layer during population.

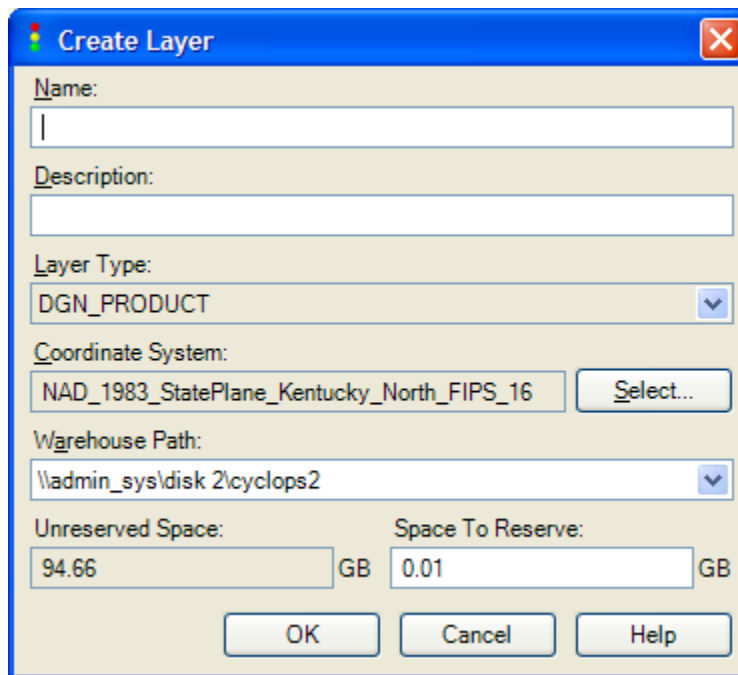


Figure 2-7 GeoCue Create Layer dialog

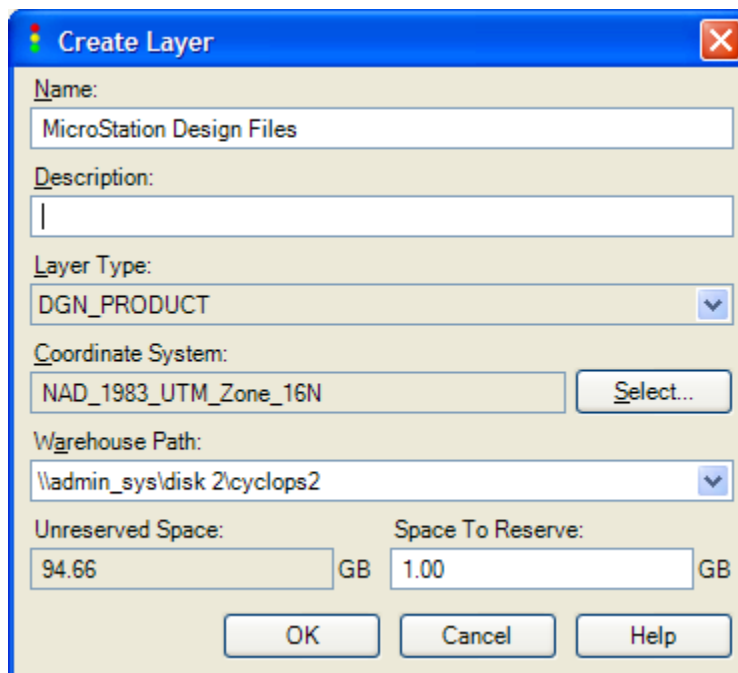


Figure 2-8 The populated Create Layer dialog

The next field on the *Create Design File Layer* dialog is the Entity Name Prefix. This field allows you to supply a prefix that will be used in creating the entity names. In this version of DEM CuePac, the entity names will be the supplied prefix followed by the associated LIDAR Working Segment name. For example, if the working segment name is “WS-0045” and you supply a prefix of “DP-“, the DGN Product entity name will be “DP-WS-0045”.

The next option is to set the MicroStation design file source. There are two choices in DEM CuePac version 1.6. These choices are detailed in the following table:

Table 2-1 Design File Options

Create Design File Option	Action
from Working Segments	The design file into which the converted LAS points are inserted will be a copy of the design file associated with the source Working Segments.
from Seed	This will generate a copy of a design file that is specified via the Design File path (use the <i>Design File...</i> button to browse to this file)

After choosing the design file source, press the *Create* button. This causes a set of entities of type DGN_Product of identical geometry to the Working Segments to be created on the DGN_PRODUCT layer. Each entity is initialized. A MicroStation design file is created in the file collection of each entity based on the method that you selected in the *Create Design File Layer* dialog. Each entity is associated with a processing Checklist for setting up the population parameters, populating the files and invoking MicroStation. During processing, the progress status is displayed at the bottom of the dialog. The dialog is shown during the Preparation phase in Figure 2-9.

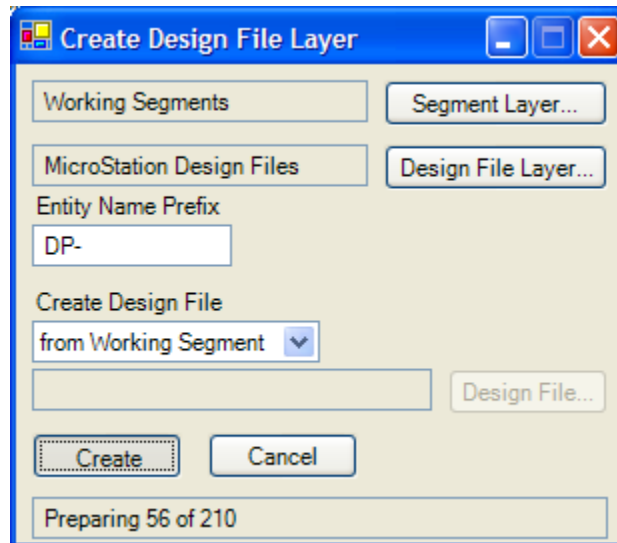


Figure 2-9 The *Create Design File Layer* dialog during processing

The new DGN_PRODUCT layer is displayed in Figure 2-10 showing the created DGN_Product entities, the entity properties and the associated checklist. You will notice that the first step in the checklist for DGN_Products is an Automatic step called “Initialization.” This step allows you to view the history of who created the DGN_Products. The history for the products we created is depicted in Figure 2-11.

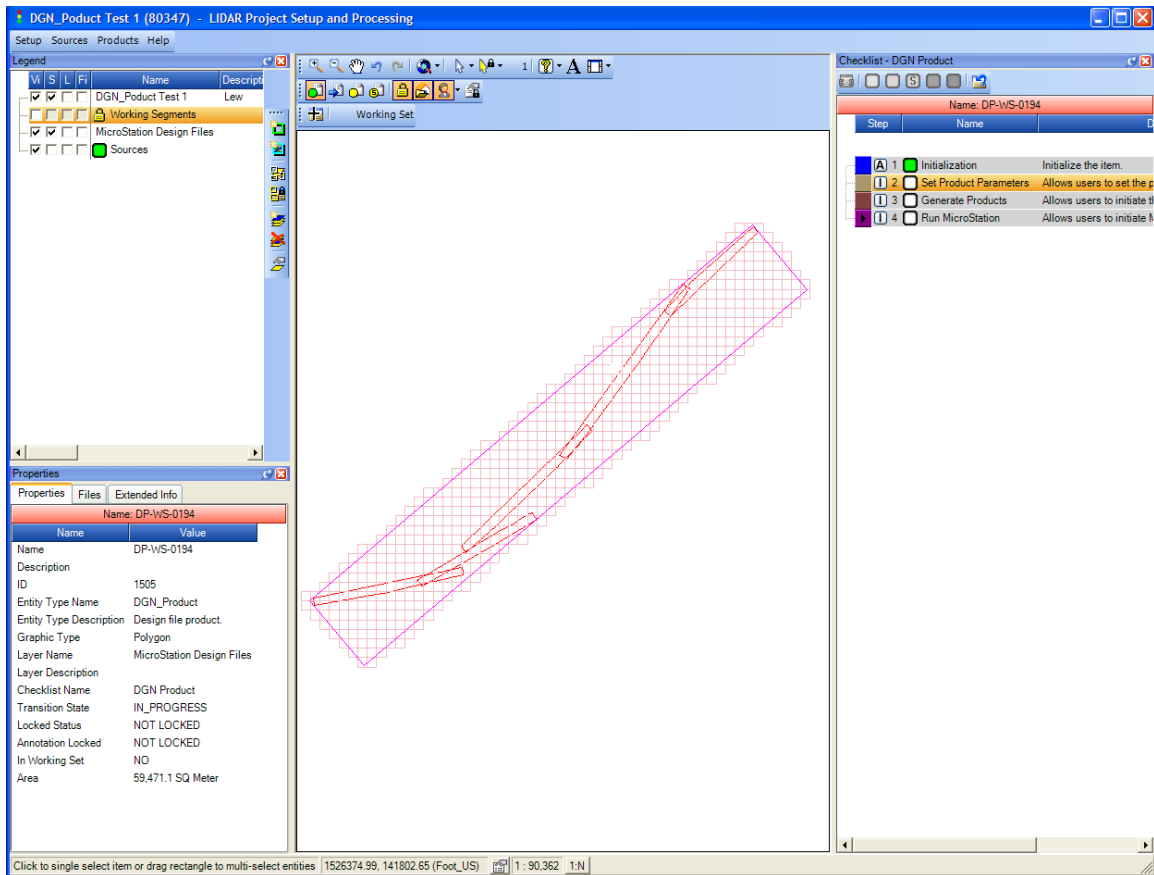


Figure 2-10 The DGN Products

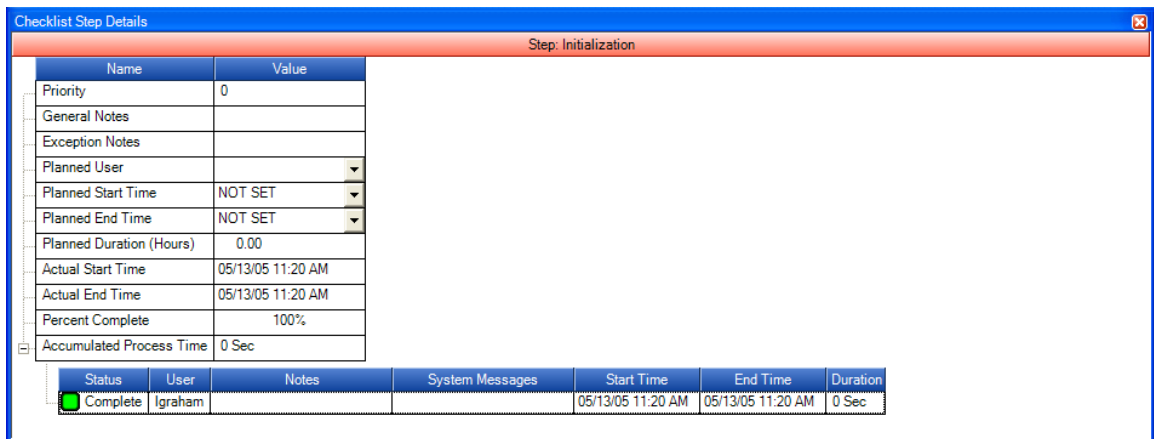


Figure 2-11 DGN_Product creation history example

2.2 Setting Product Generation Parameters

Now that the entities have been created, the next step is to set the parameters that will dictate how LAS points will be used to create DGN elements.

This step is controlled by the checklist associated with the DGN_Product entities. Using standard GeoCue commands, select the entities on which you wish to set parameters into the Working Set Queue (WSQ)

Quick Select to WSQ – remember that in GeoCue if you want to select all entities on a layer into the working set queue, simply select the layer and then choose *Add Layer Entities to Working Set* from either the right click menu or (if you have created one) the Layer toolbar.

Select the *Set Product Parameters* checklist step. If you have selected more than one DGN_Product to the Working Set, press the *Multi-Entity Mode* tool on the Checklist toolbar (see Figure 2-12).

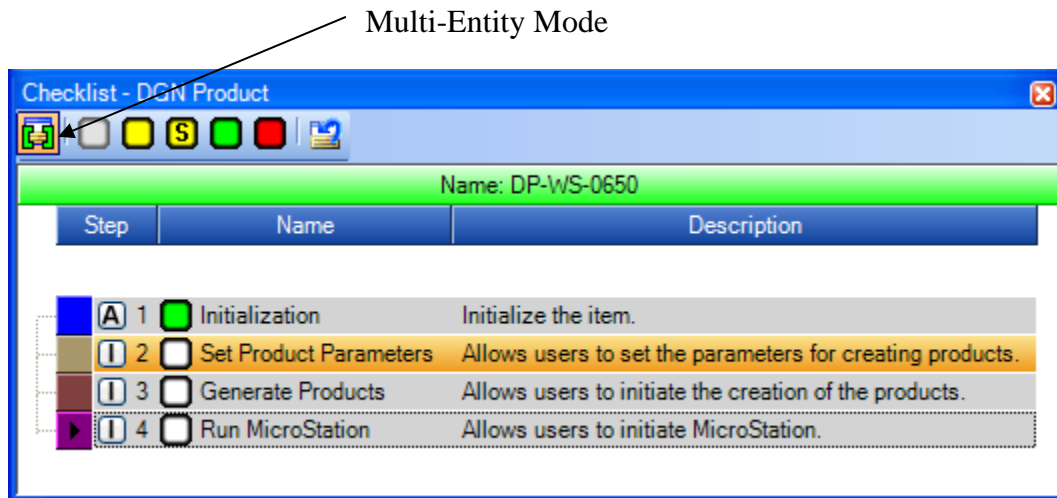


Figure 2-12 Checklist for DGN_Product, Multi-Entity Mode

Next press the yellow In-Progress button to activate the *Set Design File Population Parameters* dialog (Figure 2-13). This dialog controls the *filtering* that will be applied when creating points in the DGN file from the source LIDAR data in the Working Segments.

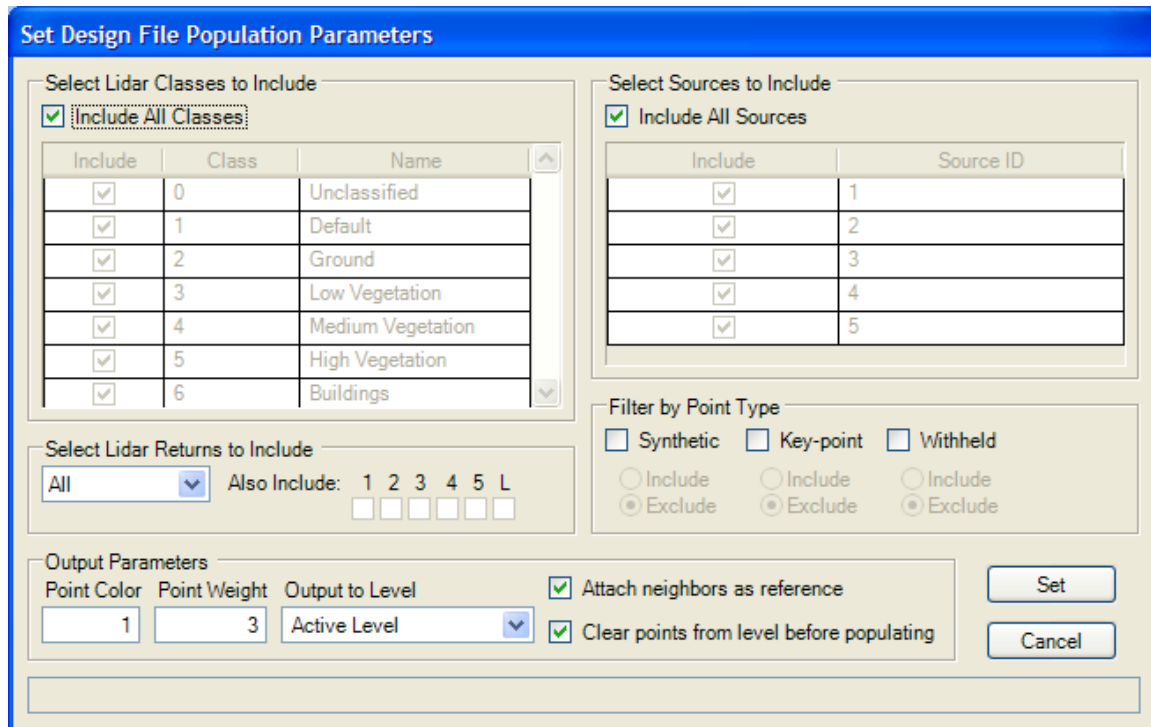


Figure 2-13 Set Design File Population Parameters dialog

The upper section of the dialog allows you to set filter parameters whereas the lower section provides control of symbology, level and several other design file related parameters. Each section is described in the following paragraphs.

LAS 1.1 – Note that this dialog is compliant with LAS 1.1 (approved March 7, 2005). If you are using LAS 1.0, do not set any of the Filter by Point Type options. Note that LAS 1.0 supported 256 classes whereas LAS 1.1 supports 32 classes. This means that you will not be able to filter out classes ranging from 32 through 255. This should not cause a problem since we are not aware of any software that used this range of classes.

Select LAS Classes to Include

If you want to include all LAS classes, check the *Include all Classes* checkbox. If you want to include only specific classes, clear this checkbox and check the specific class you would like to include. For example, a common filter might be to include only the Ground class. For this scenario, clear the *Include All Classes* checkbox and clear all of the specific checkboxes. Then set the checkbox associated with Ground (see Figure 2-14).

Multi-select – You can multi-select within the *Classes* list by selecting in either the *Class* or *Name* columns. Selection is the same as the techniques within Windows (*Shift-select* to select a range, *Control-select* to select individual items). Selected rows will highlight. Now click the checkbox in any selected row to toggle the check off and on in all selected rows.

Caution – A common error is to set the class filter such that only unpopulated classes are allowed through the filter. This results in design files containing no new point elements. For example, if you set the Class Filter to include Buildings and exclude all other classes, your design file will be empty of new points if the corresponding LAS source file has no Building classified points.

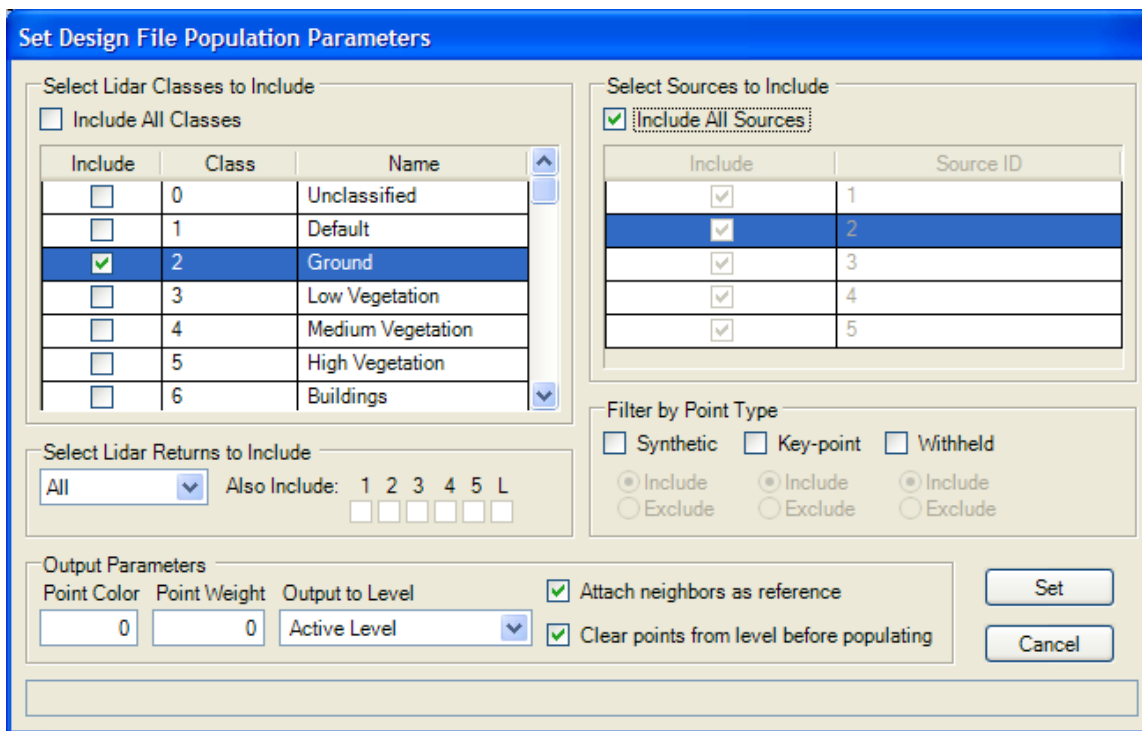


Figure 2-14 Filtering out all classes except Ground

Select Sources to Include

The *Sources* section of the *Set Design File Population Parameters* dialog allows you to filter points based on the Point Source ID attribute of each point. If all of the points originated from LIDAR flight lines, the Point Source ID will typically be the strip number. When you first invoke the dialog, a scan is made of all of the LIDAR Sources associated with the Project. Among the information gleaned during this scan are the File

Source IDs. Thus the *Sources* field of the dialog only lists File Source IDs that actually occur in the Project.

To include all points, regardless of Point Source ID, check the *Include All Sources* option. To include specific Point Source IDs, check the corresponding *Include* boxes.

NOTE – The *filtering* performed by the options of the *Set Design File Population Parameters* are ANDed. That is to say, *all* selected filtering options must be TRUE for a point to make it through the filter.

Select LIDAR Returns to Include

This section of the *Set Design File Population Parameters* allows you to select the LIDAR Returns that you want to include. Its behavior is identical to that of the Returns tab on the *Set Image Generation Parameters* dialog used to control how ortho and stereo images are generated in LIDAR 1 CuePac. If the points did not originate from a LIDAR system, then this option should be set to *All*.

All	No filtering. Uses all returns.
First	Uses first returns, this includes any return with a return number of 1.
Last	Uses the last return of a group. Also includes single returns.
Single	Uses only "one-of-one" type returns.
First of Many	Same as First except single returns are excluded.
Last of Many	Same as Last except single returns are excluded.
Checked Only	Includes those returns specified in the checkbox .

Filter by Point Type

Point Type is a new feature introduced in the 1.1 version of the LAS file specification. The three Point Type attributes are single bit values that are either set to 1 (TRUE) or 0 (FALSE). For example, if a user interactively digitized a break line and subsequently introduced that break line into the LAS file, its points should have Point Type attributes of SYNTHETIC and KEY POINT set to TRUE and WITHHELD set to FALSE (additionally, its *Class* was probably set to Ground).

You can ignore the Point Type flags by *not* checking any of the *Filter by Point Type* boxes.

CAUTION – If your data is in LAS 1.0 format do *not* select any of these options since the Point Type flags are meaningless in LAS 1.0 and thus checking any of these options will result in the unexpected omission of some or all of your data points. If you do not know if your data contain Point Type flags, then leave these three options clear (unchecked).

If you elect to filter on one or more of the Point Type attributes, you can select either an *inclusive* or *exclusive* filter logic. If you select the *include* radio button option, only points with the attribute flag set (TRUE) will be included in the *Populate* set. Conversely, if you select the *Exclude* option, only those points whose attribute is *not* set will be included.

Note that filtering in the *Set Design File Population Parameters* is an AND of all conditions. For example, if you set the check boxes for Key-point with filter option *Include* and Withheld with filter option *Exclude* then (assuming all other conditions set on the dialog are TRUE) only points with their Key Point bit set to TRUE and their Withheld bit set to FALSE will pass through the filter to be included in the *Populate* data set.

Output Parameters

The Output Parameters section of the *Set Design File Population Parameters* dialog relates to the MicroStation Design file associated with the DGN_Products entities.

The Point Color and Point Weight settings allow you to select the symbology that MicroStation will use for the points (actually zero length lines) that are loaded into the design file. These attributes have their normal MicroStation meaning (Point Color is an index into the loaded MicroStation color table, and PointWeight is one less than the line width in pixels).

The *Output to Level* combo box allows you to select either the Active Level or to key-in the level on which you would like the *Populate* function to place the points. If the level does not exist in the design file, it will be created at population time.

The *Attach neighbors as reference* creates a set of references in each design file. These references cause MicroStation to load all DGN_Product tiles that touch the current tile as *Reference* files. This option is useful if you plan to digitize into the resultant design file and need to see the adjacent data in read-only mode.

The *Clear points from level before populating* will delete any points from the design file level that you selected in the *Output to Level* prior to inserting the new points. This option is useful if you are rerunning the populate step and want to erase previous points. If, on the other hand, you have data in the associated design files (on the specified level) that you want left intact, make sure this option is cleared.

CAUTION – Deleting a large number of points by level is quite time consuming. The population algorithm checks to see if there are any other elements on other levels. If none exist, it will delete all elements in the file, which goes somewhat faster. So, make sure you have no superfluous elements on other levels if you are going to use this option.

Completing or Canceling the Dialog

When you are satisfied with all of the settings on the *Set Design File Population Parameters* dialog, press the *Set* button. An example of a populated dialog just prior to pressing *Set* is depicted in Figure 2-15.

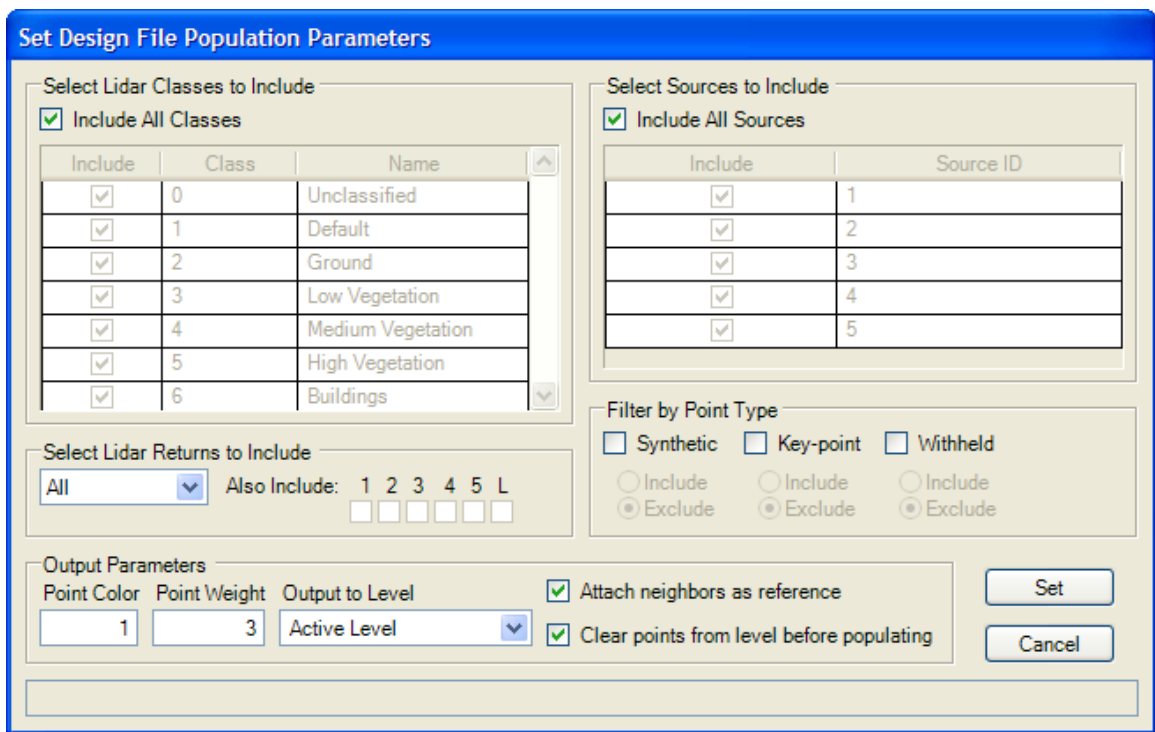


Figure 2-15 The completed *Set Design File Population Parameters* dialog

Alternatively, if you elect to abandon the parameter setting session, press *Cancel*. If you press *Cancel*, you will be presented the familiar GeoCue Checklist Step completion dialog of Figure 2-16. Insert a history note, if desired, and then set the exit status. Note

that the *Complete* option effectively allows you to preserve any values that might have been set on the DGN_Product entities *prior* to entering the *Set Design File Population Parameters* dialog. This situation might occur if you had invoked the *Set Design File Population Parameters* checklist step only to examine settings.

NOTE: If you select *Complete*, only those DGN_Product entities that had their Population Parameters set previously will have their checklist step set to *Complete*. If the Population Parameters have never been set, the checklist step will be set to *Not Started* and a system note will be added to the checklist step history indicating why it was set to *Not Started*.

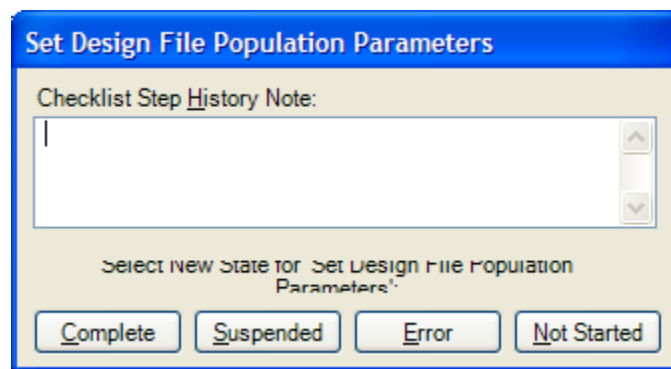


Figure 2-16 Checklist Step Completion Dialog

2.3 Generate Products

The *Generate Products* checklist step ingests LAS points from the associated working segments, filters them according to the parameters that you set in the *Set Design File Population Parameters*, optionally transforms them to the output coordinate system, converts the points that pass through the filter to zero length MicroStation line elements (the format MicroStation uses for points) and loads these points into the Design Files associated with the DGN_Product entities.

This step of processing is performed by selecting the DGN_Products that you wish to populate into the Working Set Queue and invoking the *Generate Products* checklist step.

The *Generate Products* processing is a background, non-interactive task meaning that you can exit GeoCue after invoking the step (! but do not log off or shut down your workstation!), switch to another project or perform interactive operations on the current project.

As with any GeoCue processing step, you can observe the processing status of the Generate Products step by setting the (F)ill checkbox of the DGN_PRODUCT layer and setting the Complete symbology viewing mode in the Symbology toolbar (ensure that you set the user filter to either the person who performed the step or to all users). An in-progress state is shown in Figure 2-17 where 5 DGN_Products in the upper right of the project have completed.

WARNING – There is a software defect in the latest version of MicroStation (Version 8.x) that prevents an interactive session of MicroStation from running at the same time as a software-invoked background process. This means that you cannot invoke MicroStation on the same computer that is Generating DGN_Products until all products have completed. We are working with Bentley Systems to correct this problem.

If you forget this restriction, your Generate session will fail and mark the DGN_Product entities as being in an error condition. Upon inspecting the processing history of the Generate Products checklist step, you will see an error similar to that of Figure 2-18.

You can, however, use the products as they complete generation on a separate workstation. Thus if you are Generating Products on Workstation A, you can immediately begin using products in an interactive session of MicroStation on Workstation B.

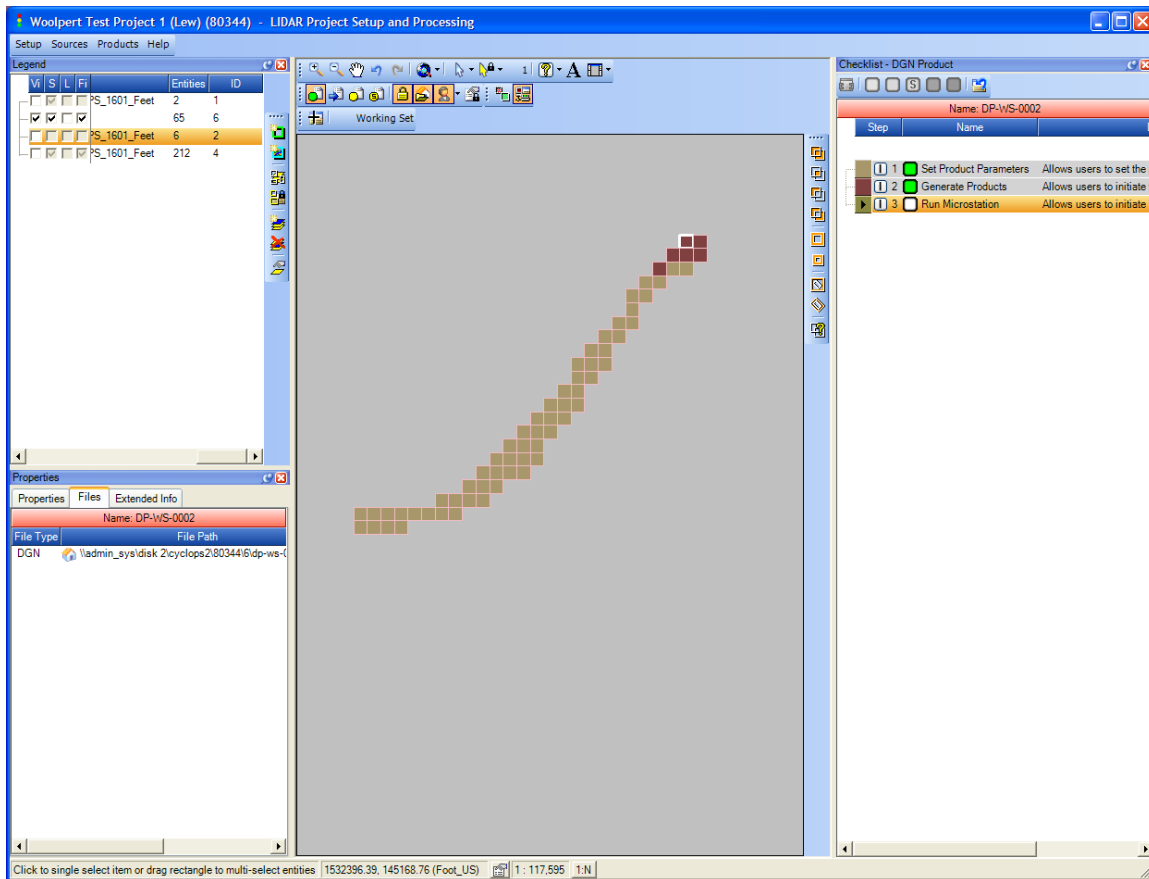


Figure 2-17 Processing status for Generate Products

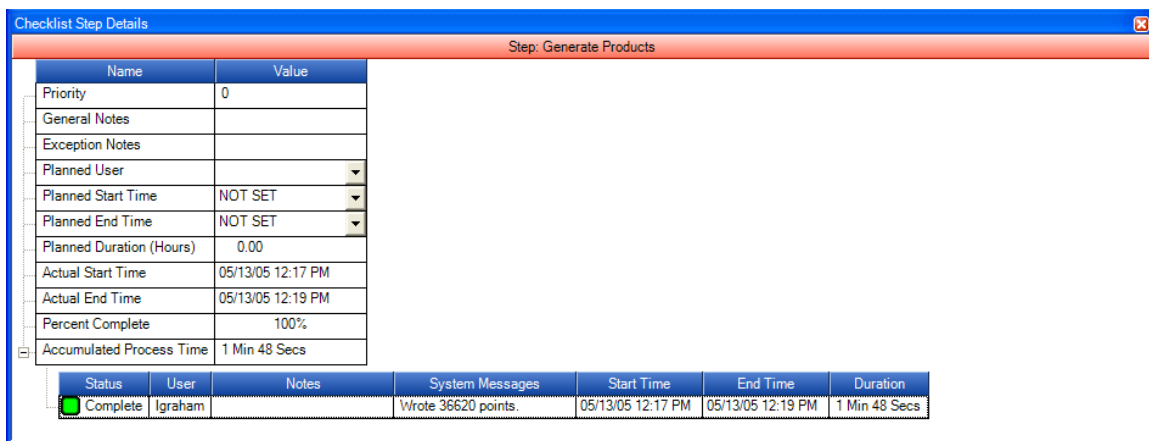
 Error	Igraham	PopDgn::Run could not obtain an instance of MicroStation. Exception: System.Runtime.InteropServices.COMException (0x800706BA): The RPC server is unavailable. at MicroStationDGN.ApplicationClass.Quit() at PopDgn.PopulateDgn.CreateUstn()		05/12/05 09:44 AM	05/12/05 09:44 AM	0 Sec
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Figure 2-18 Error from running interactive MicroStation during Generate Products

The *Generate Products* step logs the number of points populated into a DGN_Product entity in the System Messages column of the process step history log. If you invoke MicroStation using the *Run MicroStation* checklist step (see next section) but nothing displays for the selected entity, check the history step to ensure that points were actually written into the file. An example history step is shown in Figure 2-19. The most common cause of not populating any points (other than an empty working segment – see next

paragraph) is that the filter settings you applied have not allowed any points to pass through.

Warning – A common error is to Generate Products prior to Populating Working segments. This does not generate an error (since not all working segments necessarily have associated points). Your indication of this is that the *Generate Products* step will reset to NOT STARTED even though you executed the step. Examine the checklist step history, System Messages, if this OCCURS.



Name	Value
Priority	0
General Notes	
Exception Notes	
Planned User	
Planned Start Time	NOT SET
Planned End Time	NOT SET
Planned Duration (Hours)	0.00
Actual Start Time	05/13/05 12:17 PM
Actual End Time	05/13/05 12:19 PM
Percent Complete	100%
Accumulated Process Time	1 Min 48 Secs

Status	User	Notes	System Messages	Start Time	End Time	Duration
Complete	Igraham		Wrote 36620 points.	05/13/05 12:17 PM	05/13/05 12:19 PM	1 Min 48 Secs

Figure 2-19 *Generate Products* step showing 36,320 points generated

Quite often there are working segments in a project that have not been populated either because there is no LIDAR coverage for a particular segment or the working segment has not yet been populated. The *Generate Products* step examines the checklist status of its associated working segment prior to populating. If it is found that the Populate Working Segments step has not been run, the *Generate Products* step will reset to NOT STARTED. There will be a System Message entry in the checklist step history indicating the reason for the reset. This is depicted in Figure 2-20.

Name		Value
Priority		0
General Notes		
Exception Notes		
Planned User		
Planned Start Time		NOT SET
Planned End Time		NOT SET
Planned Duration (Hours)		0.00
Actual Start Time		05/13/05 12:17 PM
Actual End Time		NOT SET
Percent Complete		0%
Accumulated Process Time		41 Secs

Status	User	Notes	System Messages	Start Time	End Time	Duration
<input checked="" type="checkbox"/> In Progress	Igraham			05/13/05 12:17 PM	05/13/05 12:18 PM	41 Secs
<input type="checkbox"/> Not Started	Igraham		Setting step to Not Started. Could not generate the product because the <Copy LIDAR Points> step has not been completed on underlying working segment <WS-0001>.	05/13/05 12:18 PM	05/13/05 12:18 PM	0 Sec

Figure 2-20 The result of a working segment that has not been populated

NOTE:

You may have specified an *Output Level* on the *Design File Population Parameters* dialog that does not exist in the main design file or the reference files. In order for points on these newly created levels to be visible, the *Generate Products* step must add the `MS_REF_NEWLEVELDISPLAY` configuration variable and set it to 1 in the user's MicroStation configuration file. If you discover that some of the points in your reference files are not visible, make sure that your configuration file contains the `MS_REF_NEWLEVELDISPLAY` variable and that it is set to 1. You can examine the configuration settings in MicroStation by selecting *Workspace->Configuration...* from the MicroStation menu, which displays the dialog of Figure 2-21.

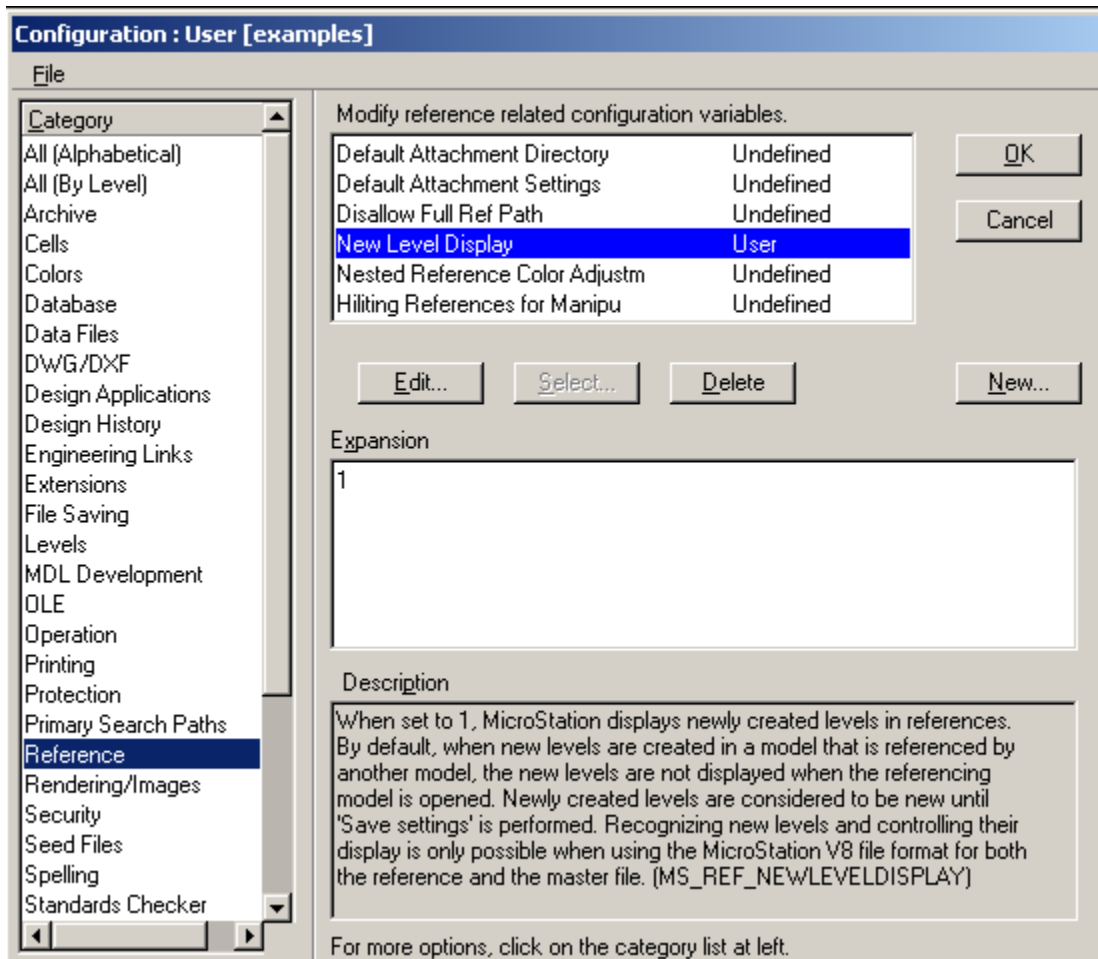


Figure 2-21 MicroStation configuration dialog

Selecting the *Reference* Category will display the configuration variables associated with reference files. The *New Level Display* variable is the friendly name for `MS_REF_NEWLEVELDISPLAY` and it is shown set correctly in the dialog above.

2.4 Run MicroStation (optional)

Your version of DEM CuePac may contain a fourth checklist step for the DGN_Product entities entitled “Run MicroStation.” Executing this step against a DGN_Product will do the following:

1. Invoke MicroStation (you must have MicroStation version 8 on the machine on which the step is invoked)
2. Load the DGN file associated with the DGN_Product entity as the active design file

3. If you selected the “Attach neighbors as reference” option on the *Set Design File Population Parameters*, the design files associated with all DGN_Product entities that touch the current entity will be loaded as reference files.

Note that the active design file is not *fit* with the load operation. Thus you generally need to fit the MicroStation view to see the loaded design files.

3 Import Class from ASCII Point Clouds

You can now import a class field when importing ASCII format point clouds. Thus the ASCII importer now supports:

1. X
2. Y
3. Z
4. Intensity
5. Class

4 Generate ArcASCII Elevation Grids

You can now create and export ArcASCII format elevation grids of virtually unlimited size. As part of the generation process, you can reproject both the horizontal and vertical coordinate systems of the data.

Note: You can use the elevation generation functions to transform the horizontal and vertical coordinate systems of elevation data. This is useful, for example, if you need to convert ellipsoid elevations to geoid elevations for product delivery.

The steps for generating the files are as follows:

4.1 Creating the Entity

Create a new layer of type Standard_ELEVATION. Note that you can set the horizontal and vertical coordinate systems of this layer to the desired output system and DEM CuePac will transform the data during generation of the grid.

Create an entity (or multiple entities) using any GeoCue entity creation method (including the Grid Generator). Note that an elevation grid can be defined as an arbitrary polygon – the output grid will be the Minimum Bounding Rectangle (MBR) of the polygon with the areas between the MBR and the polygon boundary filled with the user-specified void value.

Entity Type: ArcASCII_Elevation

Checklist: Elevation 2 (unless you have defined your own)

An example is depicted in Figure 4-1. Be careful when selecting the Entity Type and Checklist since the default values may not be the ones you want.

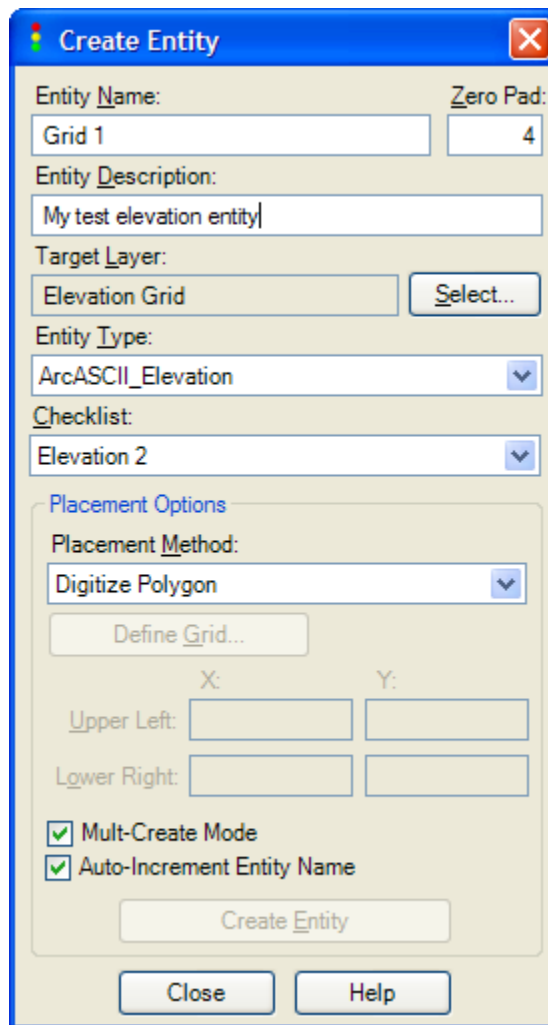


Figure 4-1 Creating the elevation grid Entity

Create the entity. For this example, we have created a polygonal elevation entity as depicted in brown in Figure 4-2.

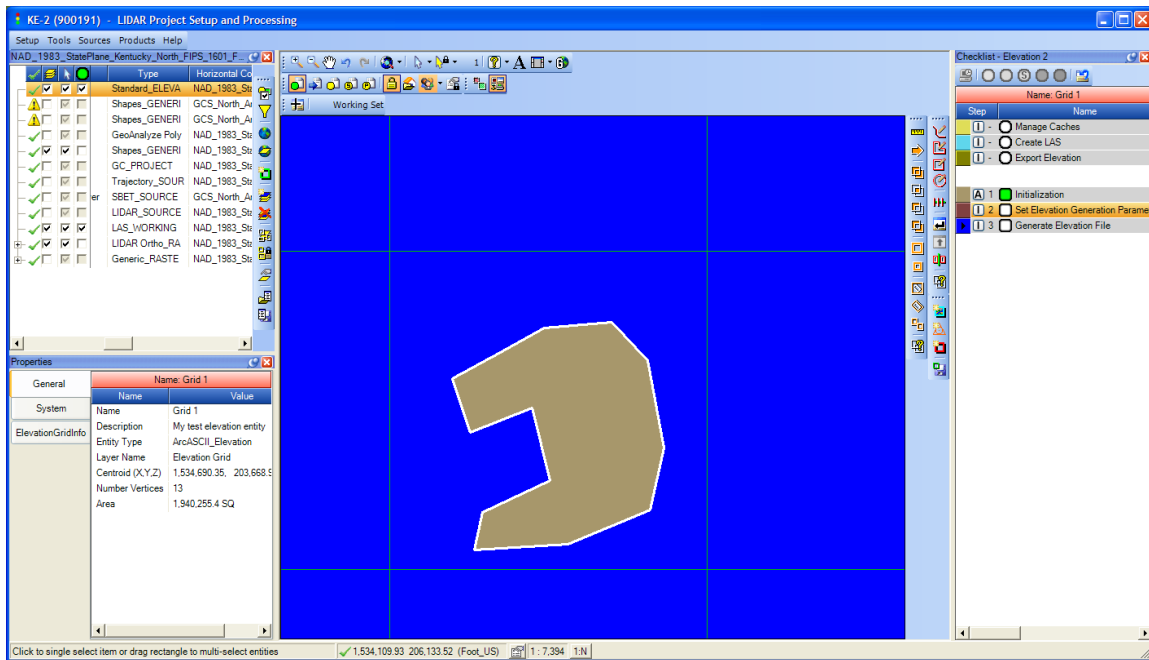


Figure 4-2 The created Elevation entity (brown)

4.2 Set Generation Parameters

Add the entity to the Working Set and execute the Set Elevation Generation Parameters checklist step. This will invoke the dialog of Figure 4-3

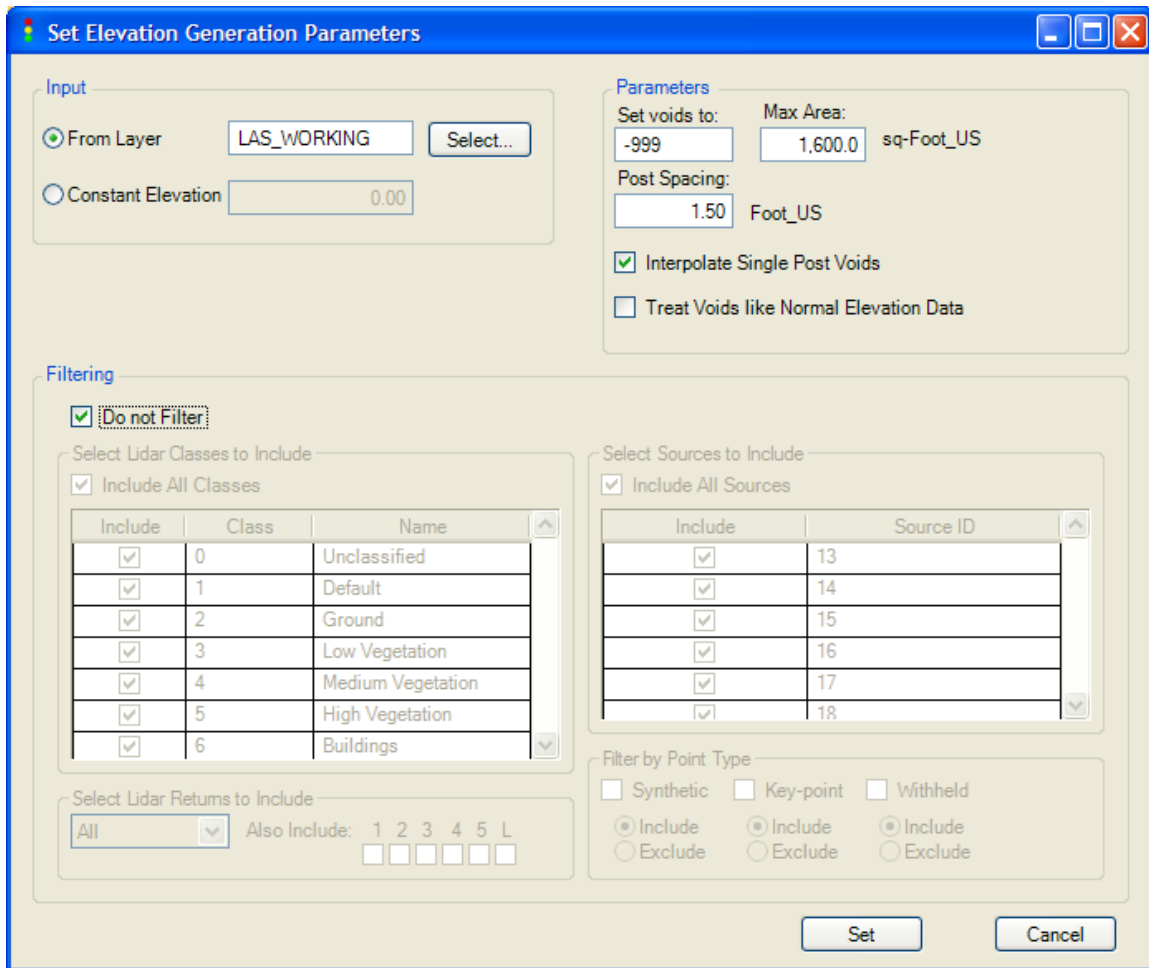


Figure 4-3 The Set Elevation Generation Parameters dialog

Set the layer that is providing the source of elevation data. This source layer must be a LAS Working Segment type (you can not directly generate elevation products from LIDAR Source layers). Alternatively, you can specify a constant elevation value if you want to generate a constant elevation grid (this is useful for operations such as re-rectifying a bridge deck to a constant elevation in an orthorectification workflow).

In the parameter section of the dialog, set the parameters as delineated in Table 4-1.

Table 4-1 Parameters

Name	Function
Set Voids to	The value to use for areas in the output that will be declared Void

Name	Function
Max Area	The elevation grid is generated by first creating a Triangulated Irregular Network (TIN) model of the input LAS data. This parameter specifies the maximum triangle size that should be interpolated without declaring the region a void. For example, if you set this to 250 sq feet, the system will interpolate elevation values for all triangles whose size is below 250 sq feet and void fill (using the value from the previously described parameter) value for triangles whose size exceeds 250 sq ft.
Interpolate Single Pixel Voids	If checked, a post-processing pass is made through the grid following interpolation. Any single post voids (a void post surrounded by non-void posts) will be filled by interpolating a value from the neighbor posts. This is effectively a noise removal filter.
Treat Voids like Normal Elevation Data	Checking this box causes DEM CuePac to insert the value you set for the void value into posts that would be declared void but to <i>not</i> set this as a void flag in the header data. This is for special purpose elevation file generation such as causing large expanses of water (that would normally be set to void) to a constant elevation value. This box should normally be left unchecked.

The lower section of the dialog labeled “Filtering” is the normal LAS filter interface. This section allows you to interpolate the grid using selected (“filtered”) LAS attributes.

When you are satisfied with the settings, press **Set**. The dialog will dismiss. You can inspect your settings by *Selecting* the elevation entity and viewing the ElevationGridInfo, tab of the Properties dialog (see Figure 4-4).

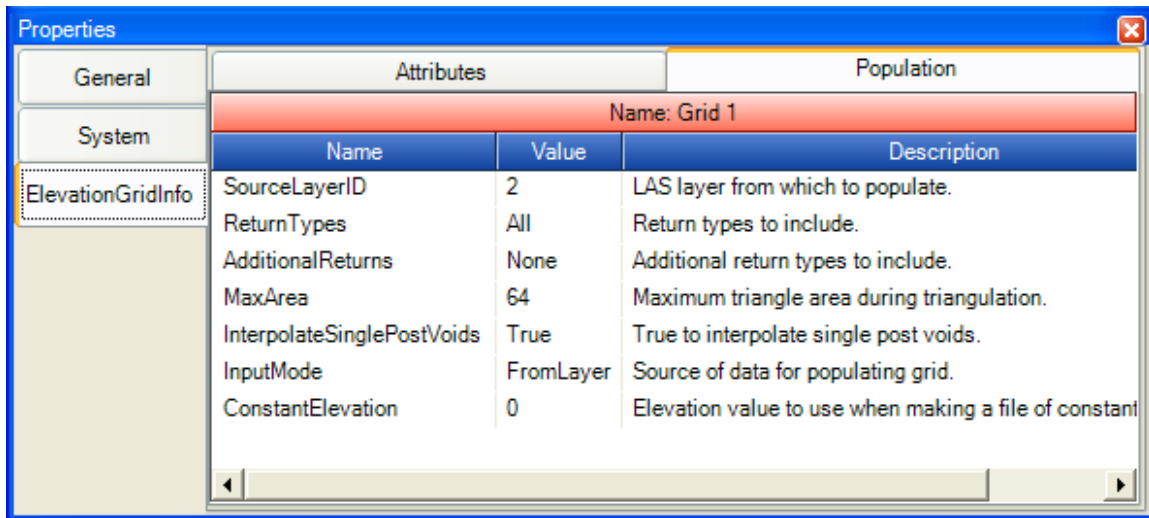


Figure 4-4 Example Elevation Parameters

4.3 Generate the File

To generate the elevation grid, add the elevation entities to the Working Set and execute the *Generate Elevation File* checklist step. Note that this step is *Distributable* across multiple or remote workstations and servers.

NOTE: GeoCue will create a temporary LAS Working Segment layer during the generation of the elevation files. This layer will be automatically deleted when the generation process is complete.

4.4 Exporting the Elevation Data (Optional)

You can easily export the generated elevation data by restoring the elevation entities to the working set and executing the *Export Elevation* unordered checklist step. This step brings up a simple “Browse to directory” dialog (Figure 4-5) via which you set the export location of the data. Select (or create a new) the export location and press **Export**.

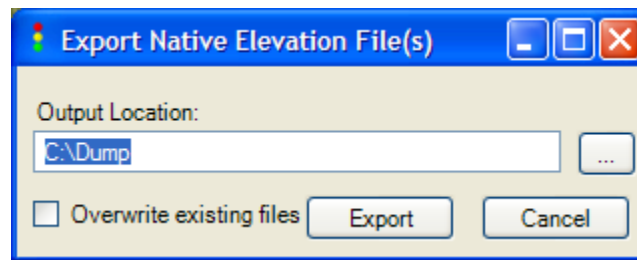


Figure 4-5 Export Directory Browse dialog

Note that the export function will not overwrite existing files of the same name unless you check the Overwrite existing files option.

NOTE: When you export an ArcASCII format elevation file, GeoCue automatically includes a projection file.

Figure 4-6 depicts the exported elevation grid displayed in Global Mapper®.

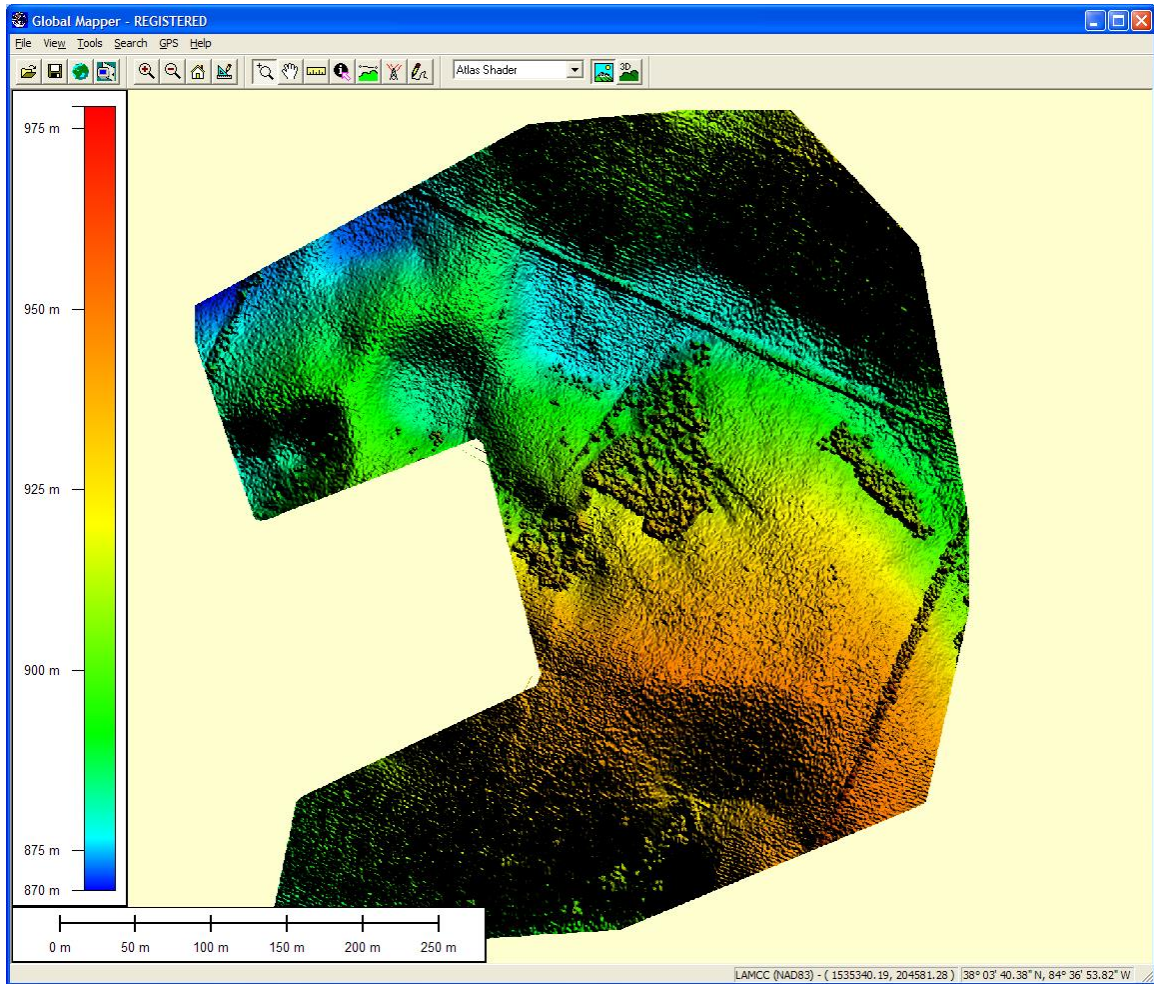


Figure 4-6 The exported grid file displayed in Global Mapper

5 Concluding Remarks

We hope that you are finding working with the GeoCue product family to be a significant increase in productivity and ease of use. Hopefully you have not discovered too many software defects (bugs).