



ENVIRONMENT BUILDER

Environment Builder Version 7.0
User's Guide
06 August 2010

NOTE: This document is intended for users who wish to modify pre-existing workflows such as those delivered in GeoCue and OEM CuePacs.

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Getting Help

This guide contains information about using the various features within Environment Builder to modify existing GeoCue Environments or to build new environments from scratch.

This guide is directed toward users who will modify GeoCue Corp. or third party supplied CuePacs. It is not directed toward third party developers of new CuePacs or utilities. Please contact us for specific programming information.

We are sure that you will experience different problems with Environment Builder that range from installation issues to defects that made it through our testing undetected. We hope that you will immediately contact us with any problems or questions and have the patience to work with us through a successful GeoCue deployment.

Please contact us via phone or email for assistance with or comments about GeoCue and Environment Builder.

email:

support@geocue.com

Phone:

01-256-461-8289

Just ask for GeoCue help and you will get connected with someone who can assist you. There is usually someone in the office between the hours of 0600 and 1800 CDT, USA on weekdays. Weekends are sort of hit or miss.

Fax (always on):

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About this Document

Welcome to the Environment Builder release 7.0 User's Guide. This document is intended primarily for users who wish to modify or extending existing GeoCue Environments.

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1 Introduction

Environment Builder an application for GeoCue Server that allows OEM partners, Integration Partners, Third Party Developers and GeoCue end-users to modify and develop new production *Environments* for GeoCue.

One license of Environment Builder is included with GeoCue Server and contains all of the functions necessary to customize an existing Environment or to develop new Environments using existing entity definitions.

This document addresses aspects of Environment Builder that an end-user can productively employ to modify “canned” environments. Thus subject areas such as creating new Entities, Layers, Extended Info and Commands are not covered. However, these capabilities are enabled in Environment Builder 2.0; if you are developing in GeoCue at this level, please contact us for Developer documentation.

Environment Builder is a rapidly evolving module within GeoCue. You will see significant enhancements to Environment Builder over the coming months. Customers who have their GeoCue software under maintenance will automatically receive upgrades as they are released.

It is assumed within this document that you are thoroughly familiar with GeoCue. If this is not the case, please work through the examples in the GeoCue Workflow Guide prior to reading this guide.

2 Environment Builder Scope of Operations

Environment Builder is a multipurpose component within GeoCue that is designed to support a wide range of uses. There are a number of modifications to GeoCue that can only be accomplished by combining functions within Environment Builder with application code specifically written for GeoCue. For example, if you need to intimately interface custom software that you have designed into a GeoCue Environment, Environment Builder will provide you a quick, interactive way to design Entities, Layers, Checklists and other components. However, you will still need to add “stub” routines to allow your software to connect to these new entities.

On the other hand, if you need to change symbology, modify checklists, move menu items, set command permissions and other Environment *modification* operations, these can be directly accomplished in Environment Builder with no coding.

This version of the Environment Builder User’s Guide covers only those modifications that can be accomplished without software development. If you are an OEM customer of GeoCue or if you are an end-user who is interested in advanced aspects of GeoCue tailoring then please contact us for additional information.

2.1 Functional Partitioning in Environment Builder

Table 2-1 provides a high level list of the segregation of functions in Environment Builder.

Table 2-1 Environment Builder Functions

<i>Function</i>	<i>Level</i>			<i>Environment Builder Tab</i>								
	<i>Current Environments</i>	<i>New Environment</i>	<i>Programming Required</i>	<i>Extended Info</i>	<i>Entity Types</i>	<i>Layer Types</i>	<i>Commands</i>	<i>Checklist Steps</i>	<i>Checklists</i>	<i>Menus</i>	<i>Environments</i>	<i>Symbology</i>
Change entity color, line style	■											■
Change Checklist Step name in an existing checklist	■								■			
Change Checklist Step	■								■			

<i>Function</i>	<i>Level</i>			<i>Environment Builder Tab</i>								
	<i>Current Environments</i>	<i>New Environment</i>	<i>Programming Required</i>	<i>Extended Info</i>	<i>Entity Types</i>	<i>Layer Types</i>	<i>Commands</i>	<i>Checklist Steps</i>	<i>Checklists</i>	<i>Menus</i>	<i>Environments</i>	<i>Symbology</i>
color in an existing checklist												
Rearrange menus (without adding or deleting commands)	■									■		
Set command permissions system-wide	■						■					
Set command permissions at the checklist step level for an existing checklist	■								■			
Create a new Checklist using existing Checklist Steps	■								■			
Create new Checklist Steps using existing Commands								■				
Create new Checklist Steps using external (non-GeoCue supplied commands)			■				■	■				

2.2 Invoking Environment Builder

The command used to start up Environment Builder is located under the **Setup** ► **Administrative** main menu path (Figure 2-1). If you do not have Administrative privileges in GeoCue, you will be prompted to enter the GeoCue Administrative Password. The default for this password is “geocueadmin” although this may have been changed by your systems administrator. You will be presented the Environment Builder main dialog (Figure 2-2).

Hint – You can avoid being prompted for the Administrator password when invoking Environment Builder by adding your name to the *Administrator* group using User Manager (see GeoCue Help).

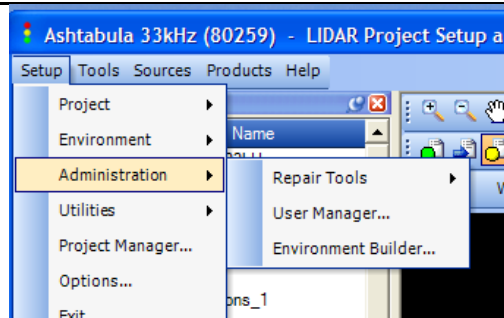


Figure 2-1 Invoking Environment Builder

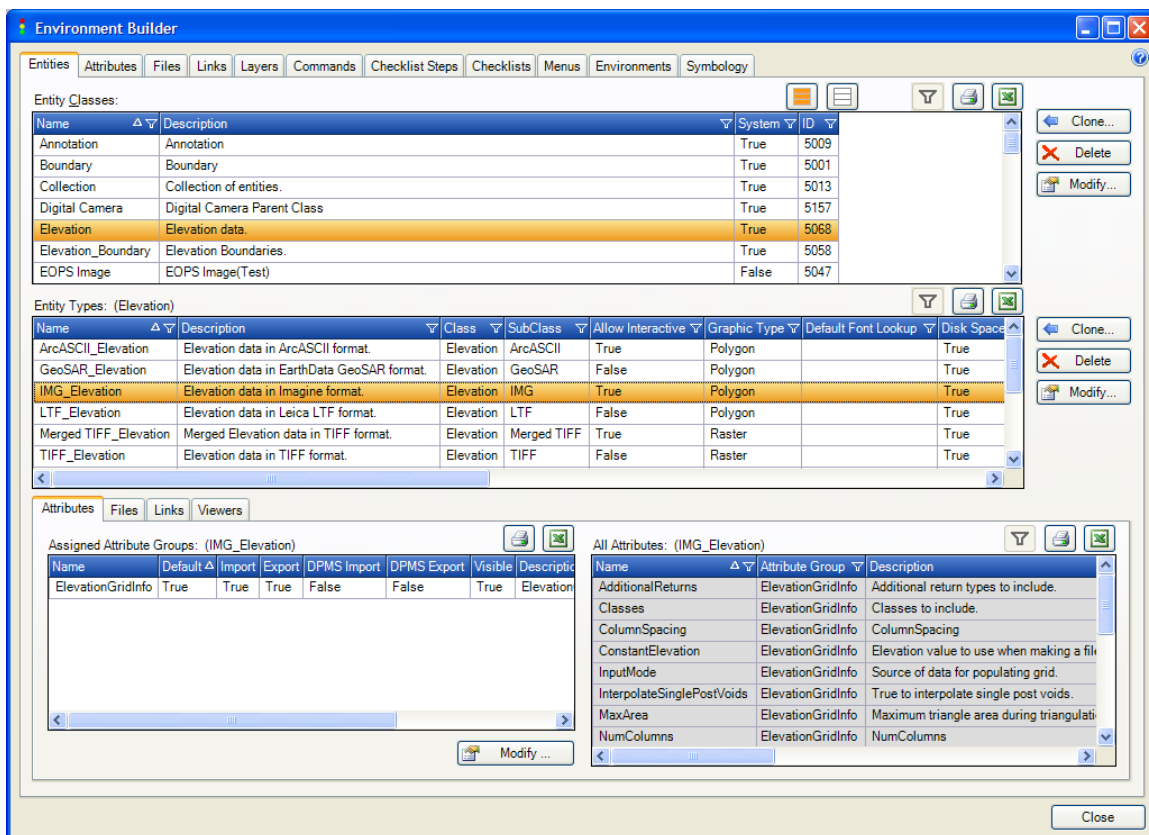


Figure 2-2 Environment Builder main dialog

Environment Builder is segregated into eleven major operational types as indicated on the Environment Builder dialog tabs. These tabs are generally in the order that one would follow when constructing a new environment from scratch. You can explore the dialog by selecting the tabs and items within the displayed lists. You will not harm any existing configurations so long as you do not press any buttons other than *Close*.

3 Environment Builder Interface

We have attempted to keep the user interface consistent throughout Environment Builder. In this section we will examine the general methods of interacting with Environment Builder.

3.1 Tabs, Tables

Environment Builder 2.0 contains eleven main tabs and a number of sub-tabs, generally organized in the order (left-to-right) that you would follow to create or extensively modify an Environment. Information on tabbed pages are generally organized from most general in tables at the top of the page to most specific at the bottom. Selecting in an upper level table typically loads a secondary table (below the less specific table) with information from the selected row.

Hint – To *unselect* a table row such that no rows are left selected, hold the *Control (Ctrl)* key while clicking in the selected row (this is the standard Windows method for deselecting).

Figure 3-1 shows the *Entities* tab page displayed with no rows selected. Selecting any row of the top table (Entity Classes) will populate the lower table with the *Entities* for the top table selection.

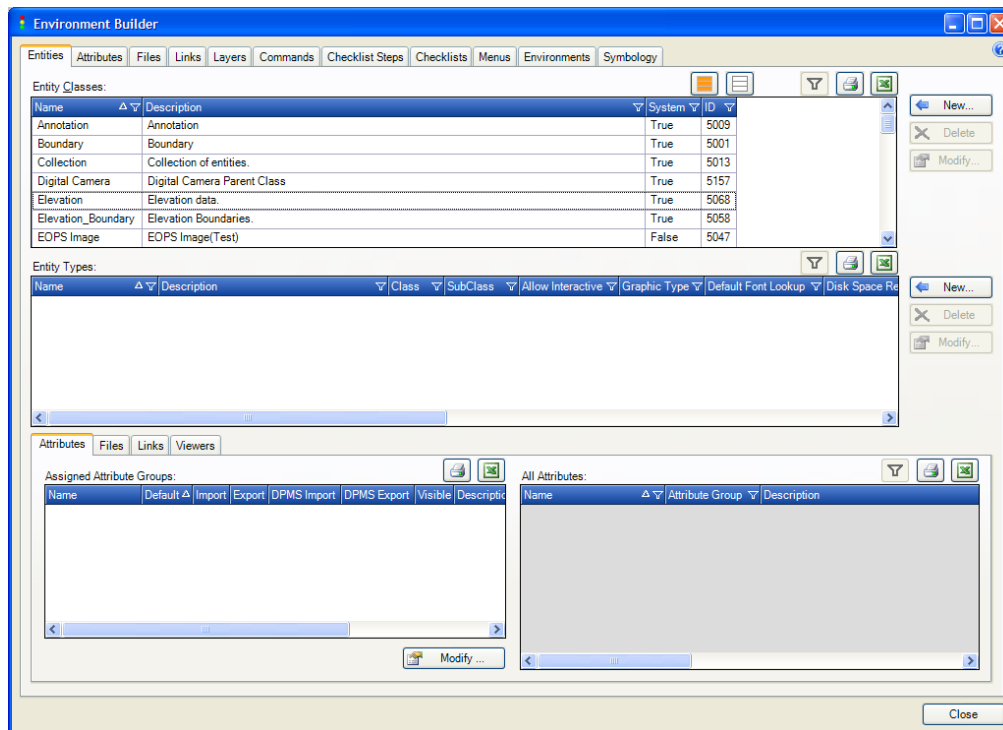


Figure 3-1 Entity tab with no rows selected

Selecting a row (for example, “Elevation”) causes the lower table to populate with the Entity Types that are subclassed from the Elevation class (Figure 3-2).

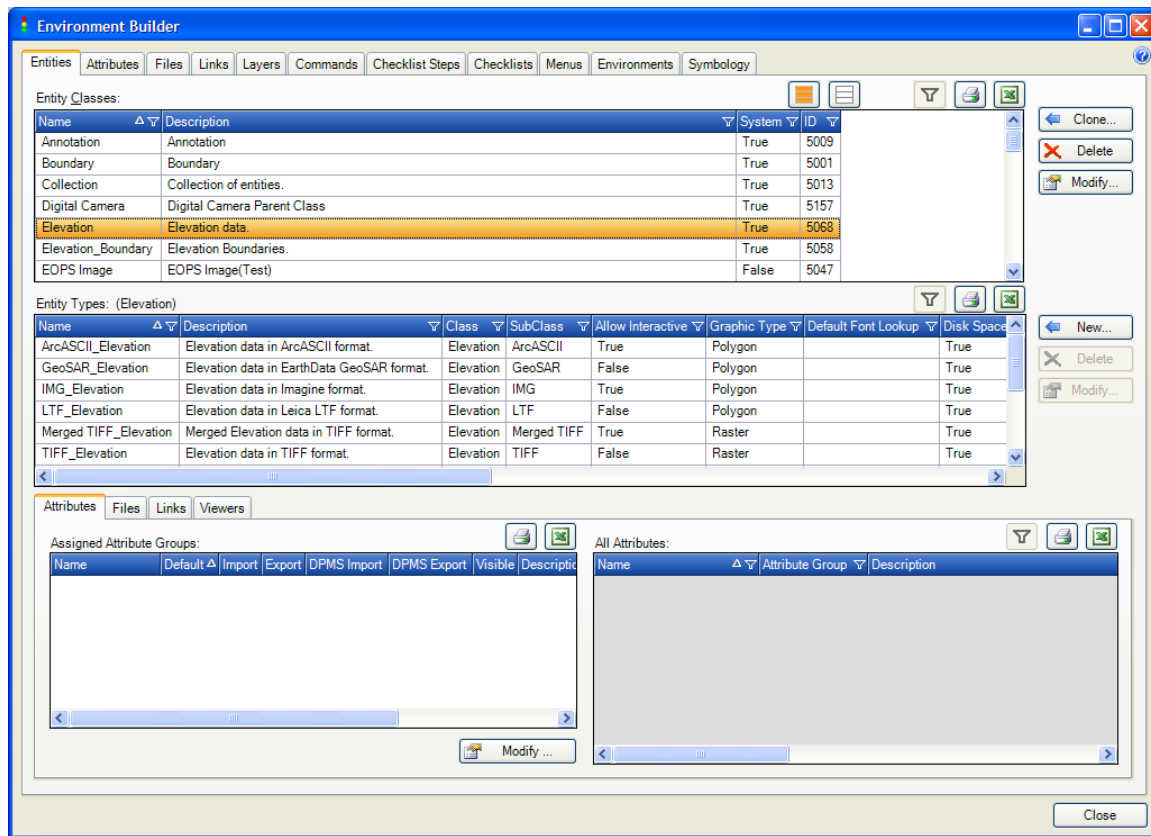


Figure 3-2 Selecting "LAS Working Segment" populates the lower table with its data fields

3.2 Sorting Columns in Tables

Most tables in Environment Builder will first display sorted on the left-most column of the table. You can resort rows in Environment Builder tables by single clicking the header area of any column of the table. Clicking a second time in the same header area will reverse sort the table. For example, if you click the *Description* column of the Extended Info table, the rows will sort by description rather than by name. If you click in the *Description* header a second time, the table will reverse sort on *Description*.

Note – When you sort a table by clicking in the header field of the desired sorting column, a triangle symbol will appear. This symbol indicates both the column on which the table is currently sorted and the direction of the sort (*UP* indicates normal order, *DOWN* indicate reverse order).

3.3 System Flag

Environments for GeoCue can be delivered by GeoCue Corp., other companies or internally developed by you. Since Environment Builder gives you a wide range of capabilities to modify the system, we needed a method to keep core environments from being damaged due to user changes. We keep items that should not be modified safe via a *System Tag*. In nearly every table in Environment Builder, you will note a column labeled **System**. If this flag is set to True, the modifications that you can perform on the associated data are limited.

Note – In release 2.0, the restrictions placed on System delivered items are overly restrictive. As we gain experience with the types of modifications that users wish to perform on system data, we will ease up on these restrictions.

Please send notes to us (support@niirs10.com) concerning areas that you want to modify but cannot due to the protections we have added with the System flag.

3.4 Creating New Entries

For most tables in Environment Builder, you can create a new, user defined entry by pressing the *New...* button associated with the table (always to the upper right of the table). There are two modes for creating new entries:

1. Blank Entry – If you press *New...* with no rows of the associated table highlighted, you will create a new entry from scratch.
2. Selected Row – If you press *New...* with a row of the table selected, Environment Builder will create a *template* from the selected row and allow you to edit fields to create your new entry. This is often the expedient way to create a new item.

3.5 Deleting Entries

To delete an entry, simply select the entry in the table and press the *Delete* button. You will receive a confirmation dialog asking if you are sure you want to delete the selected item (Figure 3-3).

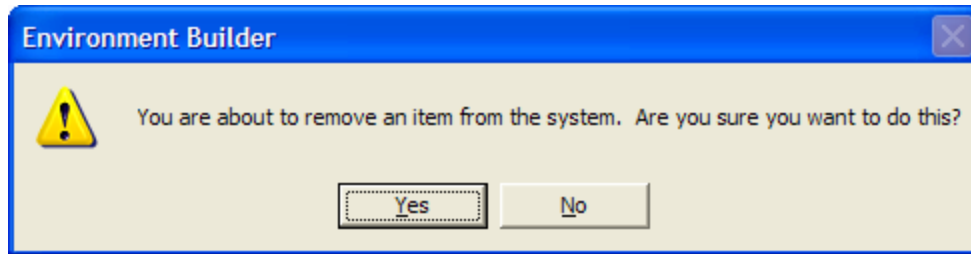


Figure 3-3 Delete Confirmation Dialog

WARNING – Be certain to check before deleting! A deleted item cannot be restored (we currently do not have an Undo function).

If you select an item with the System flag set to True and attempt a delete, you will receive the notification message of Figure 3-4. Thus we protect the integrity of GeoCue for system supplied data.

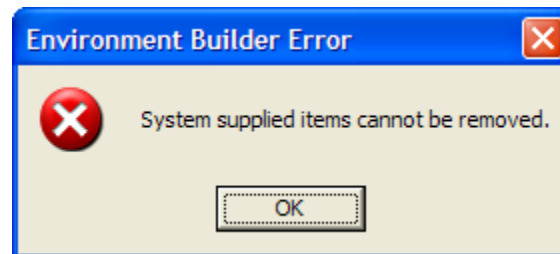


Figure 3-4 Attempt to delete a System entry

3.6 Modifying Entries

To modify an entry, select the table row that you wish to modify and press the *Modify...* button beside the table. The dialog presented will be context specific. The modifications that are allowed are dependent on both the System flag and the associations that exist between the item that you are attempting to modify and other items in the system. Characteristics of entries that cannot be modified are either *grayed* out or simply do not appear on the edit dialog. For example, if you attempt to modify the entity type, “LAS Working Segment”, you will note that the only modifiable element is the description (Figure 3-5)!

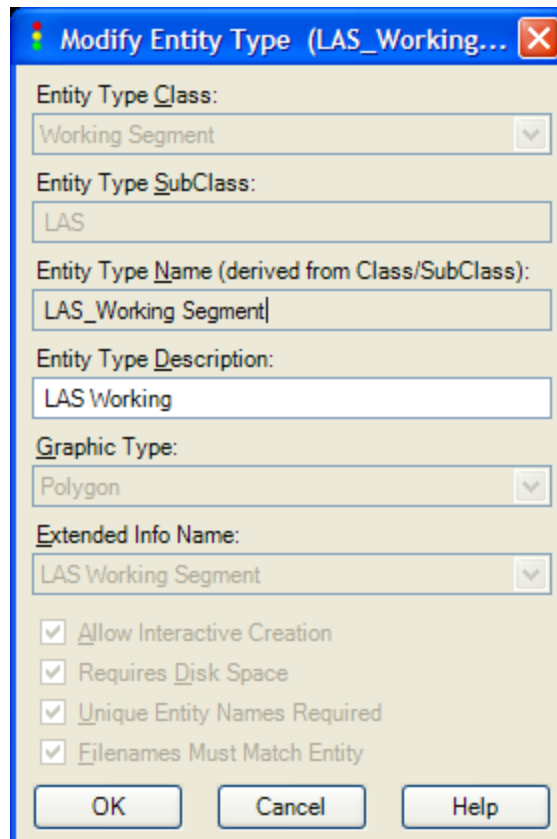


Figure 3-5 Modify dialog for LAS Working Segment

3.7 Effectivity of Changes

Environment Builder directly interfaces with the GeoCue Server database. In general, changes occur as dialogs are dismissed via the **OK** button. Thus there is not an overall **OK, Cancel** button set for the Environment Builder main frame dialog.

Note that you can make changes to an environment while other users are processing projects in that same environment. Thus Environment Builder is fully multiuser safe.

Note – Most changes made via Environment Builder require that projects using that environment be closed and reopened to load the changes into the user’s GeoCue Client. This means, for example, if you change symbology (line style, color and etc.) these symbology changes will not be reflected in open projects until they are closed and reopened.

4 The GeoCue Permissions System

GeoCue provides an extensive *permissions system* that allows you to control access to a wide variety of services within the system. The GeoCue permissions system is based on the user’s Windows login and uses Windows Authentication throughout.

GeoCue provides two general access control protocols; Users and Groups. User level access means that you are controlling access based on a user’s individual login. Group level access control means that you have created a Group (simply a name such as Quality Assurance) and then are assigning access permissions to the Group.

Note that while User access is synonymous with a Windows login (i. e. a user name in GeoCue must have an exactly corresponding name in the Windows login system), Groups are entirely a construct of GeoCue. This means that you do not need to create windows permission *Groups* in your domain server to support Groups in GeoCue. This greatly simplifies permission management within GeoCue.

4.1 Creating Users and Groups

User and Group assignments for GeoCue are managed via the GeoCue *User Manager*. User Manager can be accessed either on your GeoCue Server node or via the *Setup ► Administration ► User Manager...* on any GeoCue client. Creating users and groups is explained in both the GeoCue Server *Help* as well as the GeoCue Client Workflow guide.

Hint – We recommend controlling access by using groups. This gives you a level of indirection and hence makes the addition and deletion of specific users manageable from a single location. For example, if you want Joe and Bob to be the only technicians with access to a Quality Assurance checklist step, don’t simply assign Bob and Joe to the step. Instead, create a Group (via User Manager) named, for example, Quality Assurance and add Bob and John to this group. Next set the access on the QC checklist step to the group Quality Assurance. Notice that if you have QC access peppered throughout your system then adding Sally will be easy if you have a group but very involved if you had to find every QC step and add Sally at that level.

4.2 Permission Hierarchy in GeoCue

The access system within GeoCue has several levels, some of which are hierarchical. The general hierarchy is depicted in Figure 4-1. To navigate to a particular level in the hierarchy, a user must have the permission necessary to pass through each ‘gate’. For

example, if a particular command has been assigned permission restrictions and if that restriction is “Administrator”, a user who does not have Administrator privilege will be blocked at the Command ‘gate’ even if they have sufficient permissions to navigate the path *GeoCue User* → *Environment* → *Checklist* → *Checklist Step*.

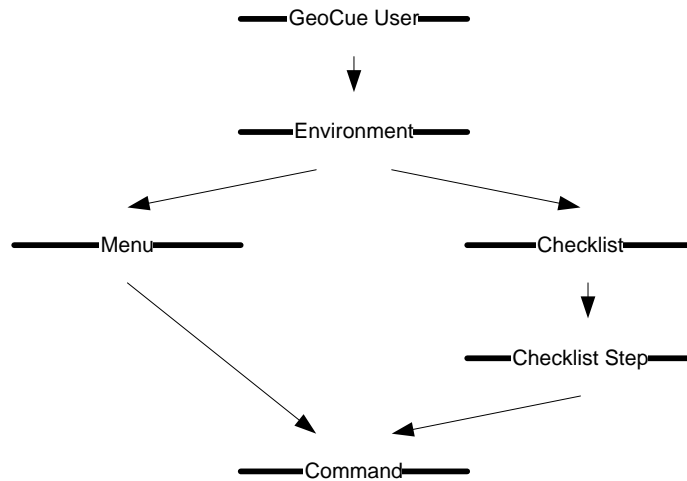


Figure 4-1 Permission Hierarchy in GeoCue

Note: The default database delivered with GeoCue has no permissions set. This means that anyone who has been added to GeoCue as a user has access to all elements except those with ‘hard-wired’ administrator access requirements (currently User Manager and Environment Builder). Thus you do not need to use any aspect of the permissions system in GeoCue.

4.3 Setting Access Permissions in GeoCue

We will explain the use of the permissions system in GeoCue via an example. Start up Environment Builder and select the Environments tab. Select the LIDAR entry in the *Environment Classes* table and LIDAR Setup and Processing in the *Environments* table. Scroll the *Environments* table with the horizontal and vertical scroll bars until you can see the LIDAR Setup and Processing row and the User and Groups column. Your dialog should resemble Figure 4-2.

Note that the Users and Groups entry for the selected row is blank. This means that Users and Groups have not been restricted for this environment (the default for our delivered database) and thus any user that has permission to start GeoCue can access the LIDAR Setup and Processing environment.

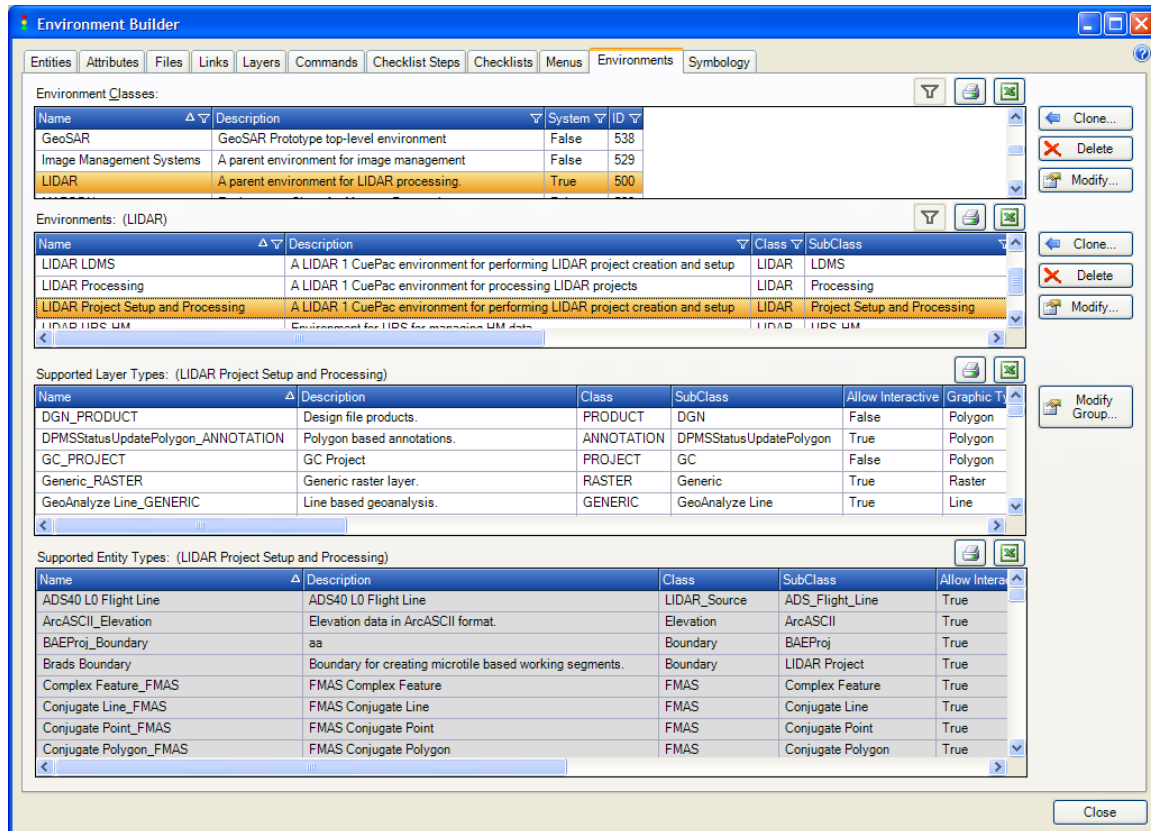


Figure 4-2 The Environments Tab with LIDAR Setup and Processing selected

Suppose that you want to restrict LIDAR Setup and Processing to a group of users called “LIDAR Project Managers” such that technicians who are not members of this group cannot use this environment (they instead would use a more restricted environment such as “LIDAR Processing”). This process is described in the next two subsections.

4.3.1 Adding a Group to GeoCue¹

The first step is to create the new group. You create new groups via the standard GeoCue User Manager interface. Start up User Manager via the GeoCue menu path **Setup ► Administration ► User Manager...** (Figure 4-3). Note that if you do not have Administrator privileges, you will be prompted for the Administrator password for GeoCue before you can access User Manager. The contents of your dialog will, of course, be quite different from Figure 2-1 since it will contain your company’s users.

NOTE: The default administrative password for GeoCue is “geocueadmin” (all lower case and do not type the quotation marks). Your GeoCue system administrator may have changed this password so if your login fails, contact this person for the correct password.

¹ This information is also covered in the GeoCue Server User’s Guide. It is repeated here for your convenience. **User Manager** is a component of GeoCue Server, not Environment Builder.

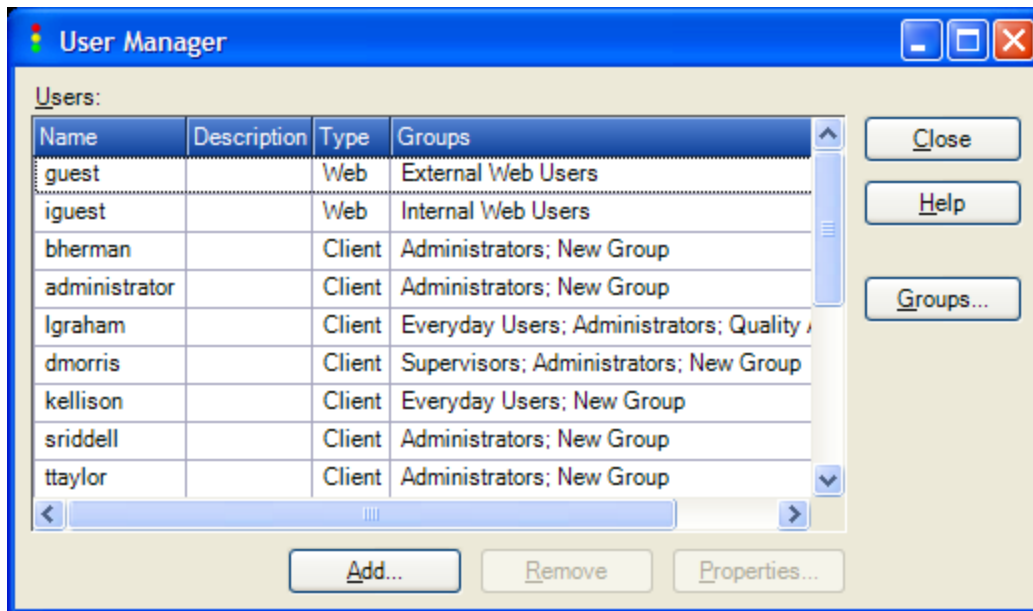


Figure 4-3 Entry dialog for User Manager

Press the **Groups...** button to access the Group manager. This will display a dialog similar to Figure 4-4 (again, the exact contents of your dialog will depend on what groups your Systems administrator has established).

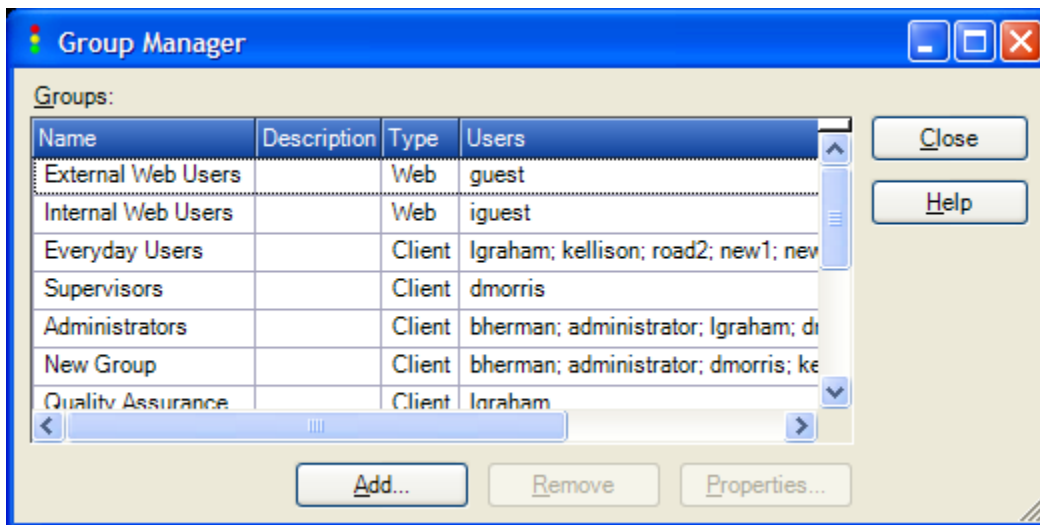


Figure 4-4 Group Manager dialog

Press the **Add...** button to bring up the dialog needed to add groups. In the **Name** field, type “LIDAR Project Managers”. Type a description for your new group, if desired. Make sure you keep the group type set to “GeoCue Client Group”.

Add the users who will be members of this group by selecting in the Available Users table and pressing the **Add** button (note that you can multi-select in this table). Our setup appears in Figure 4-5. Note that we have added “lgraham” and “kellison” as valid members of our new group.

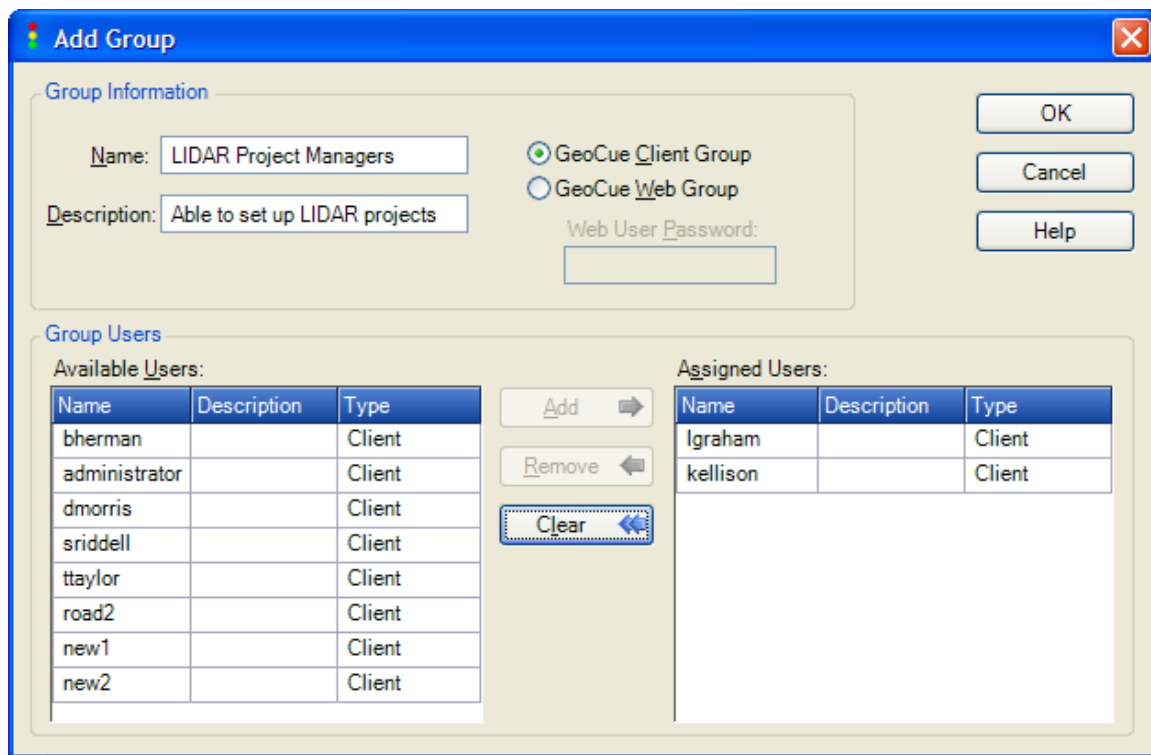


Figure 4-5 Adding the LIDAR Project Managers group

Press **OK** to accept your new group. **Close** the subsequent User Manager dialogs.

4.3.2 Setting the Permissions for the Environment

Now that your new group has been established, the next step is to set the Users and Groups field on the LIDAR Processing and Setup *environment*. With this row selected in the *Environments* table on the *Environments* tab in Environment Builder, press the **Modify...** button to the right of the *Environments* table. This will bring up the dialog of Figure 4-6. Press the button to the right of the Users and Groups field. This will invoke the User and Group Assignment dialog. Select the Groups and/or Users that you wish to assign and press the Assign button (you can multi-select from both the Available Groups and the Available Users tables simultaneously). If you inadvertently add an element to the Assigned Users and Groups table, simply select the undesired entry and press Unassign.

NOTE: In GeoCue, having *no* assigned users or groups means that *everyone* who can access GeoCue can access the function. We use this philosophy to ease the maintenance of a GeoCue deployment. Otherwise you would have to visit every area where permissions can be set and establish valid users and groups! This is literally hundreds of areas in GeoCue.

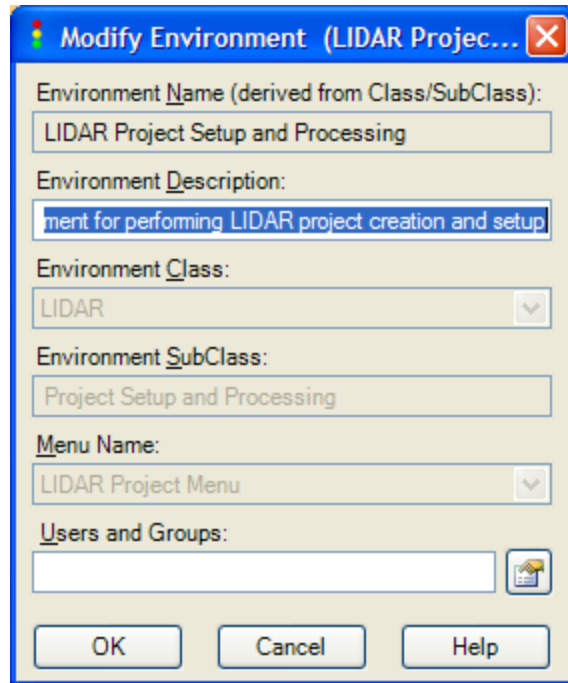


Figure 4-6 The Modify Environment dialog

Our User and Group Assignment dialog is depicted in Figure 4-7. Accept the change by pressing **OK**. This will return you to the Modify Environment dialog. Accept this by pressing **OK**. You will note that the User and Groups column of the LIDAR Setup and Processing row in the *Environments* table now reflects our change.

From this point forward, only members of the LIDAR Project Managers group will be able to enter the LIDAR Setup and Processing environment.

If you do not want this change to remain permanent, modify the table entry as described above and unassign all users and groups. This will return the step to uncontrolled access.

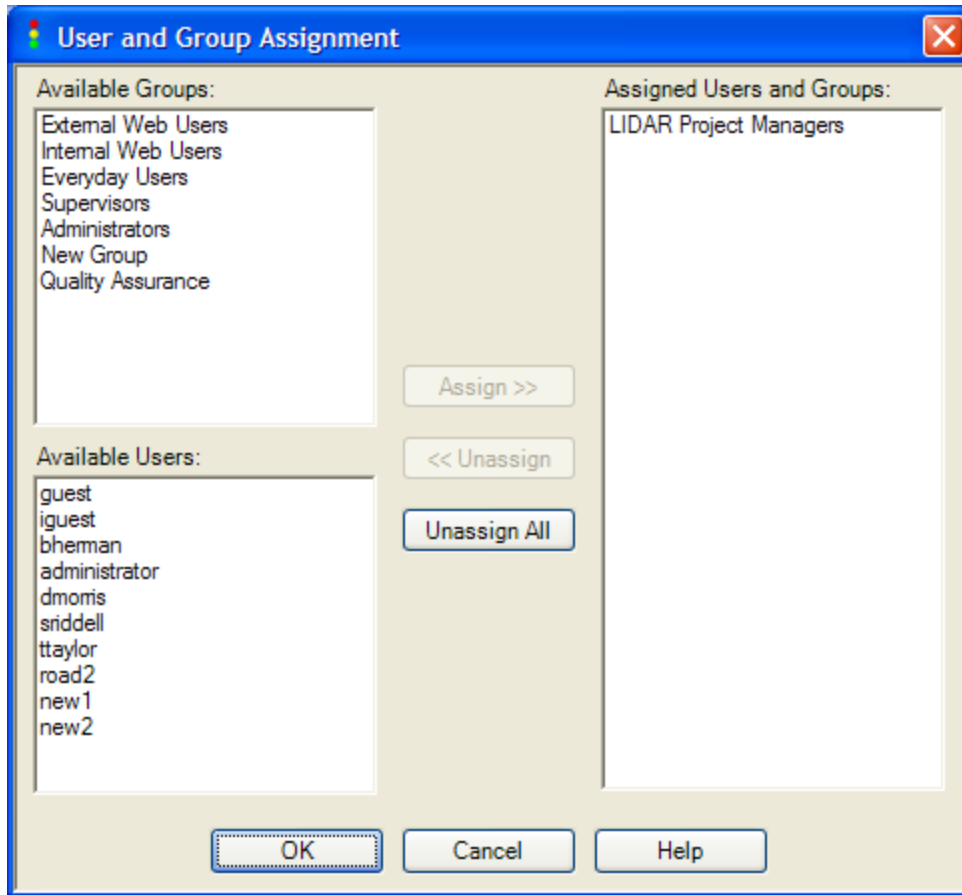


Figure 4-7 Assigning the LIDAR Project Managers group

5 Attributes

All processing elements within GeoCue are represented as *Entities*. An entity contains, among other items, standard metadata. This standard metadata is displayed on the *General*, *Files* and *System* tabs of the property dialog. In addition, an entity can contain additional metadata that is quite entity-specific. We call these metadata *Attributes*. Attributes can be designed interactively using Environment Builder. In addition, an External Command (XC) can programmatically define attributes

Other than its description, System defined attributes cannot be modified.

6 Entity Types

An *Entity* is the basic building block in GeoCue. An entity is a *metadata container* that can, in many cases, be directly manipulated within the user interface of a GeoCue Client.

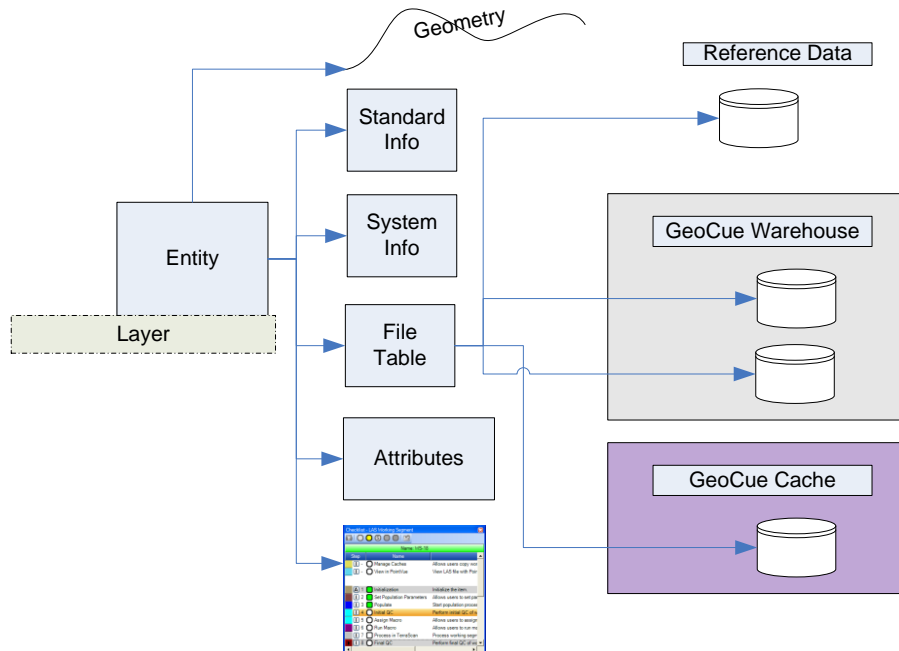


Figure 6-1 Entity Structure

Entities are categorized by *Class* and *Type*. This distinction is primarily of use to GeoCue programmers. For example, in the LIDAR 1 CuePac, Import LIDAR Sources, the entity type selection filters entities based on `CLASS == LIDAR_Source`. Thus if you were to add a new entity of class `LIDAR_SOURCE`, any *Type*, it will be displayed in the Import LIDAR Source dialog.

There are no user modifiable fields for an Entity other than its description.

7 Layer Types

Layers serve essentially the same function in GeoCue as they do in a modern Geographic Information System application such as ArcView²; that is, a container for entities. As with *Entities*, Layers are categorized into Classes and Types.

The top level table on the Layer Types tab defines layer Classes. The second table defines Layer Types. The only user modifiable field for Layer Types is the *Automatically Lock Layer When Creating* option (see Figure 7-1). Setting this option places the layer Delete Lock in a set state when the layer is created. It is a good idea to set this option for layers on which you seldom delete entities since this will protect you from making inadvertent deletions.

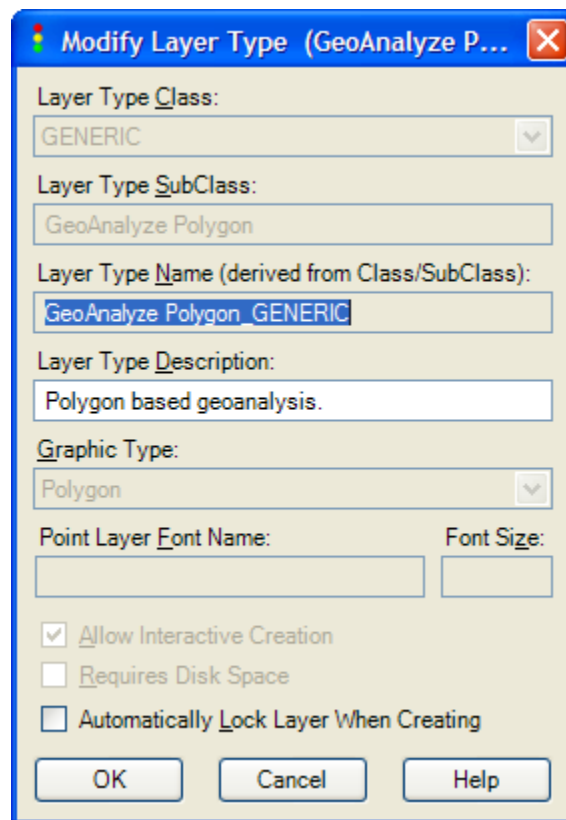


Figure 7-1 Layer Type edit dialog

The third table on the Layer Types dialog is used to map *Entities* to layers. To change the *Entity – Layer* mapping, select the layer you wish to modify in the Layer Types table. This will cause the Supported Entity Types table to display a list of the entities currently mapped to the selected layer. The Layer-Entity mapping cannot be changed for layers on which the System flag is set to True.

² ArcView is a registered trademark of Environmental Systems Research Institute (ESRI), Inc.

Programmer's note – The graphic type of a layer is determined by the first graphic type of the first entity mapped to the layer.

8 Commands

The *Commands* tab provides a list of all commands that are currently registered in the GeoCue database.

Programmer's Note – Newly created commands that require licensing must be registered with the GeoCue Server License Manager. Unlicensed commands can be directly added via the Commands tab of Environment Builder.

8.1 Command Line Switches

```
-P <ParentID>
-p <ProjectID>
-e <EnvironmentID>
-U <UserName>, <MachineName>
-q <InputQueueID>
-s <StepIndex>
-t <EntityType, LayerType>
-A <StepAction>
-c <CommandTag>
-a <AuxiliaryInputID>
-G <GAC>
-I <UniqueID>
-T <TaskID>
-F <UserCommandParameterFile>
-f <ErrorReturnStringFile>
```

9 Checklist Steps

A *Checklist Step* represents a single entry within an *Entity* checklist. Checklist Steps are collected into Checklists. A Checklist, in turn, is mapped to a supported list of entities. In general, a Checklist is assigned to an Entity when the Entity is created.

The Checklist Steps tab of Environment Builder (Figure 9-1) can be thought of as the Checklist Step library for your GeoCue database. Every defined Checklist Step within your system, regardless of processing environment, will appear in this list. Checklist steps are uniquely identified by their **Key**.

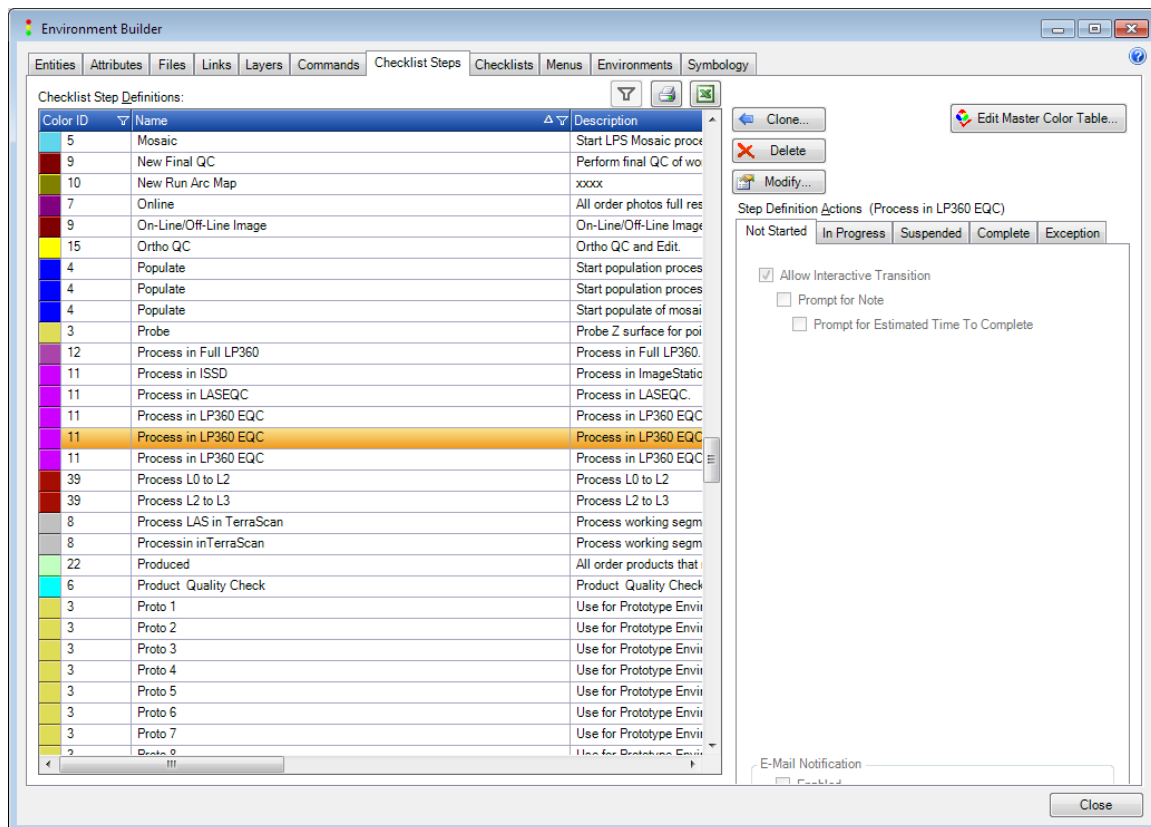


Figure 9-1: Checklist Step Tab of Environment Builder

9.1 Step Actions

You can review all of the actions associated with a Checklist Step by selecting the desired step in the *Checklist Step Definitions* table and then tabbing through the *Step Definitions Actions* dialog on the right-hand side of the table. Note that entries in this table cannot be modified for Checklist Steps flagged as System.

9.2 Modifying System-defined Checklist Steps

You can modify several aspects of the system supplied checklist step. To place a step in *Edit* mode, select the desired step and press the **Modify...** button. This will bring up the Checklist Step editor (Figure 9-2) in modify mode.

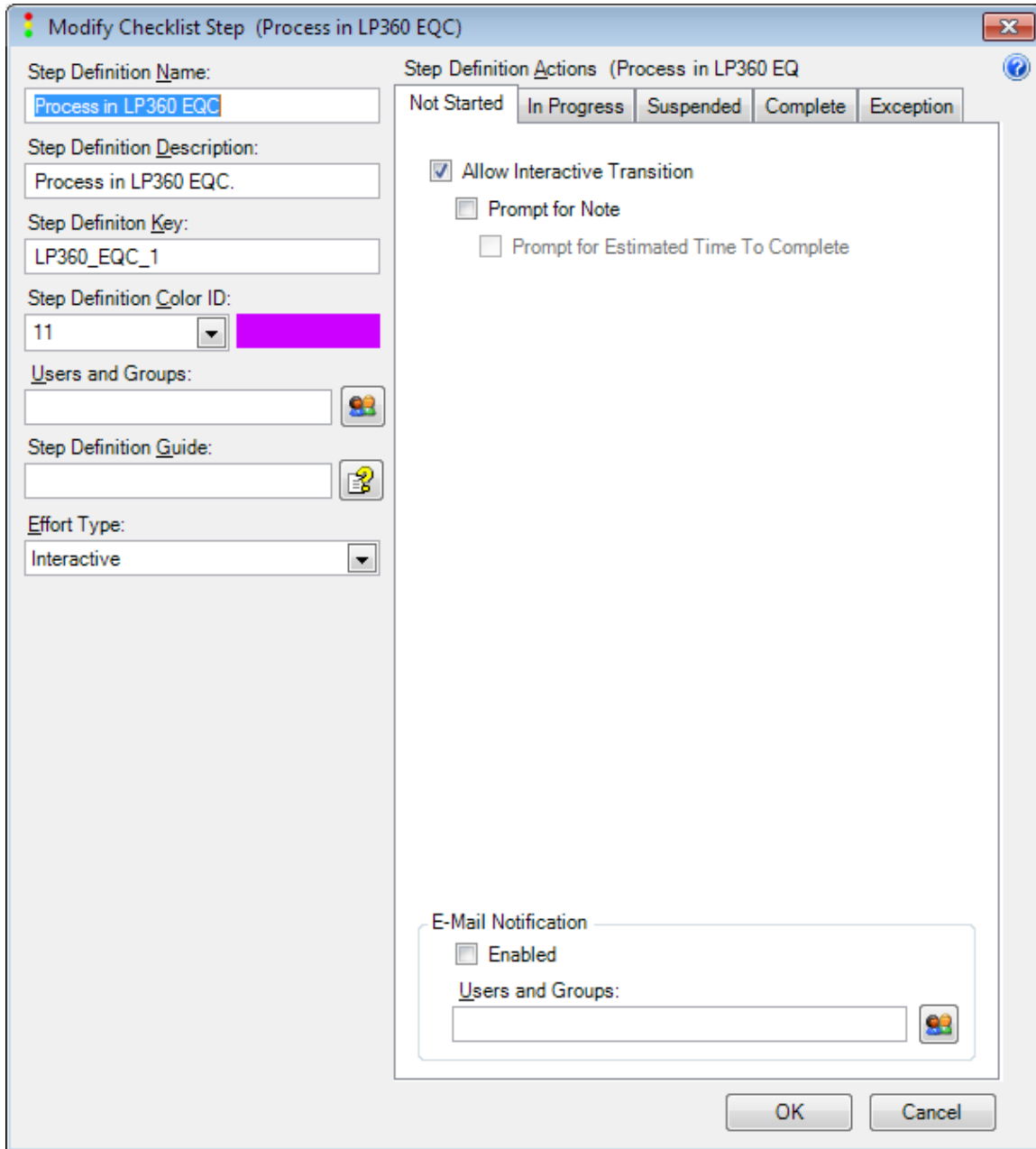


Figure 9-2 Checklist Step Editor

9.2.1 General Behavior/Appearance

The general behavior of a Checklist Step is governed by the settings on the left side of the Checklist Step Editor dialog.

9.2.1.1 Step Definition Name/Description

Checklist Steps can be named at two levels. The base name is accessed in the Modify Checklist Step dialog from the Checklist Step pane (where you are now if you are following the examples of this section). When a checklist step is added to a specific checklist (next chapter), this base name can be overridden.

If you change the Step Definition Name, then the name displayed in every checklist in the system that uses this particular step and for which the step name has not been overridden, will be changed to the name you enter into this field on the dialog. Thus, unless you actually wish to globally change the name, use the checklist step override facility provided under the Checklist tab.

You can modify the description of a checklist step by entering a new description string in the Step Definition Description field.

9.2.1.2 Step Definition Color ID

Checklist steps can be assigned one of 62 colors from a Checklist Master Color Table. This Master Color Table is a system-wide resource. To change a checklist step color, select a new color from the drop-down selector in the Step Definition Color ID field. This color can be overridden on a checklist by checklist basis. Thus, unless you are making a global system change, use the override method available through the Checklist tab.

NOTE: If you change the Step Definition Color ID for a Checklist Step, every occurrence of this step in all Checklists will be changed to the new color unless you have specifically *overridden* the step color in an individual checklist.

Thus if your goal is, for example, to change the color of the QC checklist step in the Process LAS Working Segments checklist but not affect the QC checklist step color for other checklists, then do not change the step color in the Checklist Step library.

9.2.1.3 Users and Groups

You can control access to a checklist step by setting User and Group privilege on the step. For example, if you want to restrict the Final QC step to users who have been assigned to a Group called Quality Assurance, you can do this via the Users and Groups setting on the Checklist Step Editor dialog. Note that just like other settings that apply to Checklist Steps, this will have global scope. If you wish to restrict Final QC for particular checklists only then do not set permissions at this level (use instead the Checklist editor described in the next chapter).

To carry out the example above, first create a new group called Quality Assurance using *User Manager* (this is accessed from the GeoCue Setup ► Administration menu). Add (again with User Manager) the users you wish to have Quality Assurance privilege. Now press the select button next to the Users and Groups field on the Modify Checklist Step dialog. You will be presented the dialog of Figure 9-3. Now select the Quality Assurance entry in the *Available Groups* section of the dialog and press the *Assign* button. Press OK to accept the changes and exit the dialog. You will now see that the Quality Assurance group has been added to the Users and Groups field on the Checklist Step editor dialog (Figure 9-4).

Note: When you create a new access group (such as our example of Quality Assurance), don’t forget to add members to the group!

When you exit the Checklist Step editor dialog, you will notice that the Users and Groups you have assigned will appear in the Users and Groups column of the Checklist Step Definitions table.

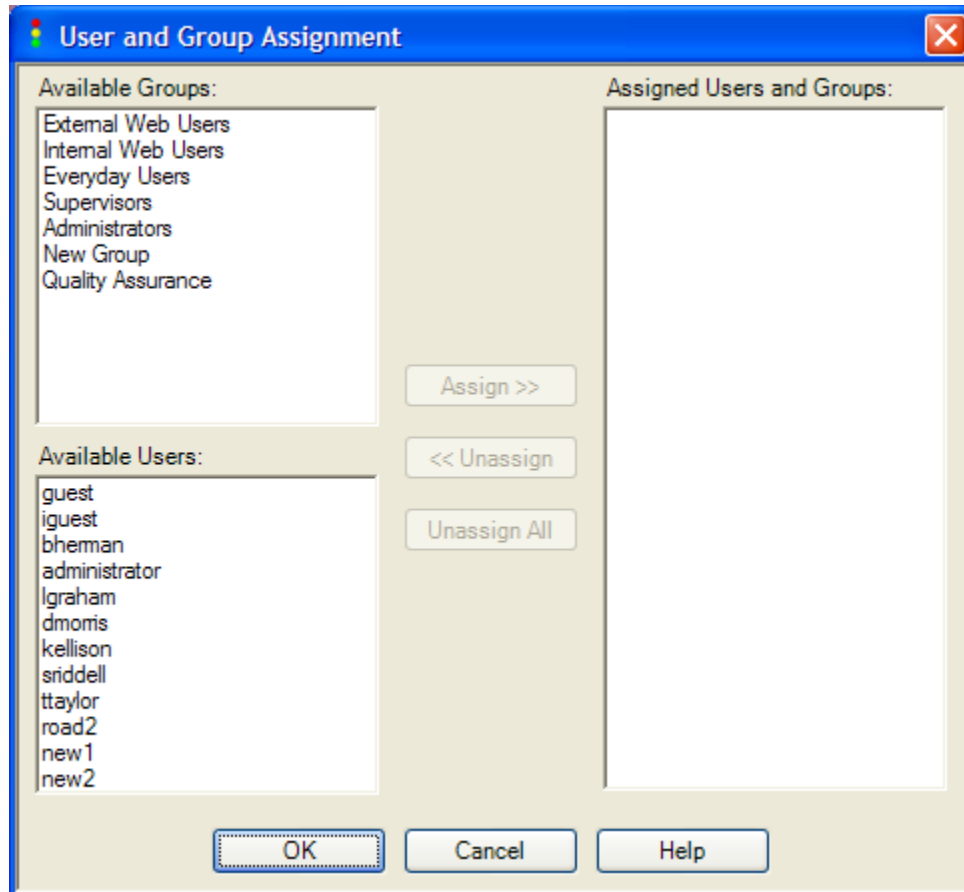


Figure 9-3 User and Group Assignment dialog as accessed from the Checklist Step editor

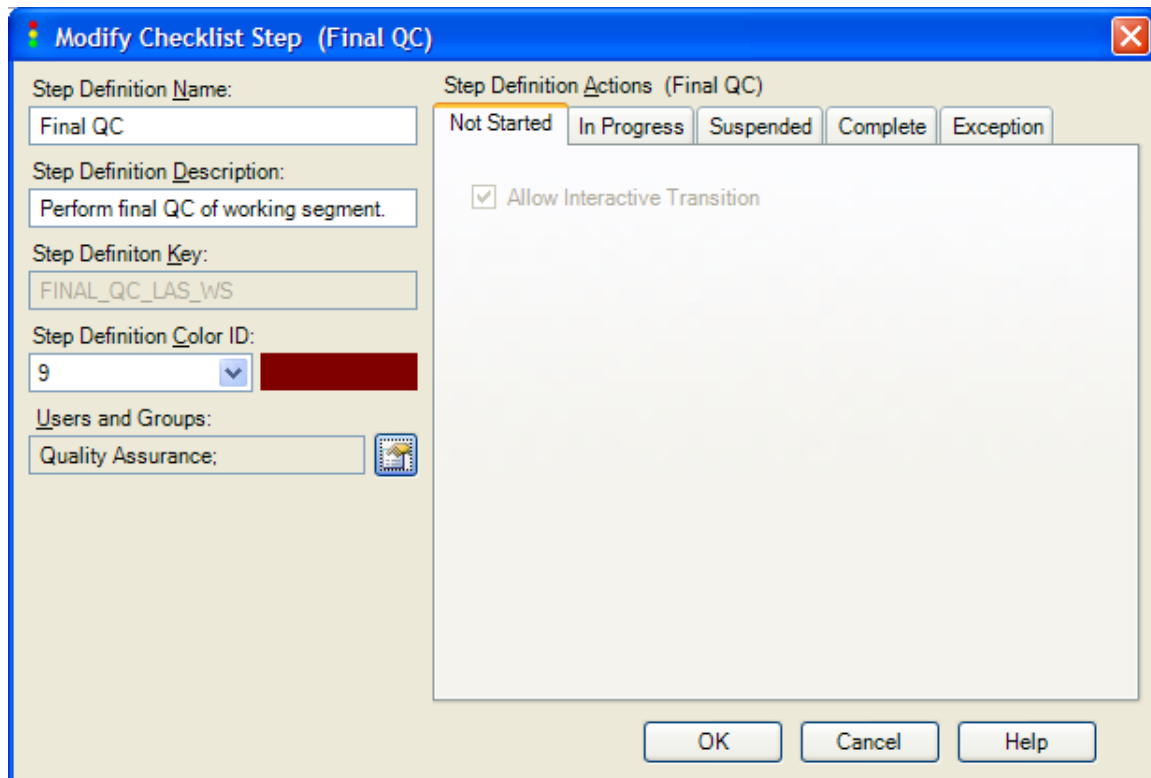


Figure 9-4 "Quality Assurance" group assigned to the Final QC step

9.2.1.4 Step Definition Guide

You can provide help documentation for your Checklist Steps. These are generally pdf files but you can use any format for which you have associated a Windows file viewer. These files will need to be Read Only since you may have several users accessing the same checklist step at the same time.

Step Definition Guides are stored in the “GeoCue\Common\Document Library” directory on your GeoCue Server machine (not the individual Client machines). We recommend that you create subdirectories for document organization.

IF you have added a guide to a step, a question mark appears in the Checklist. Pressing this question mark will display the guide.

9.2.2 Transition Actions

Transition Actions are specified using the tab for which you wish to modify/set transitions. The In Progress tab for a checklist step is depicted in Figure 9-5. Note that many options may be disabled, depending on the associated command and the type of

Checklist Step (e.g. User Created or System). Some of the options are set on the Command tab and simply reflected on this dialog as read only fields.

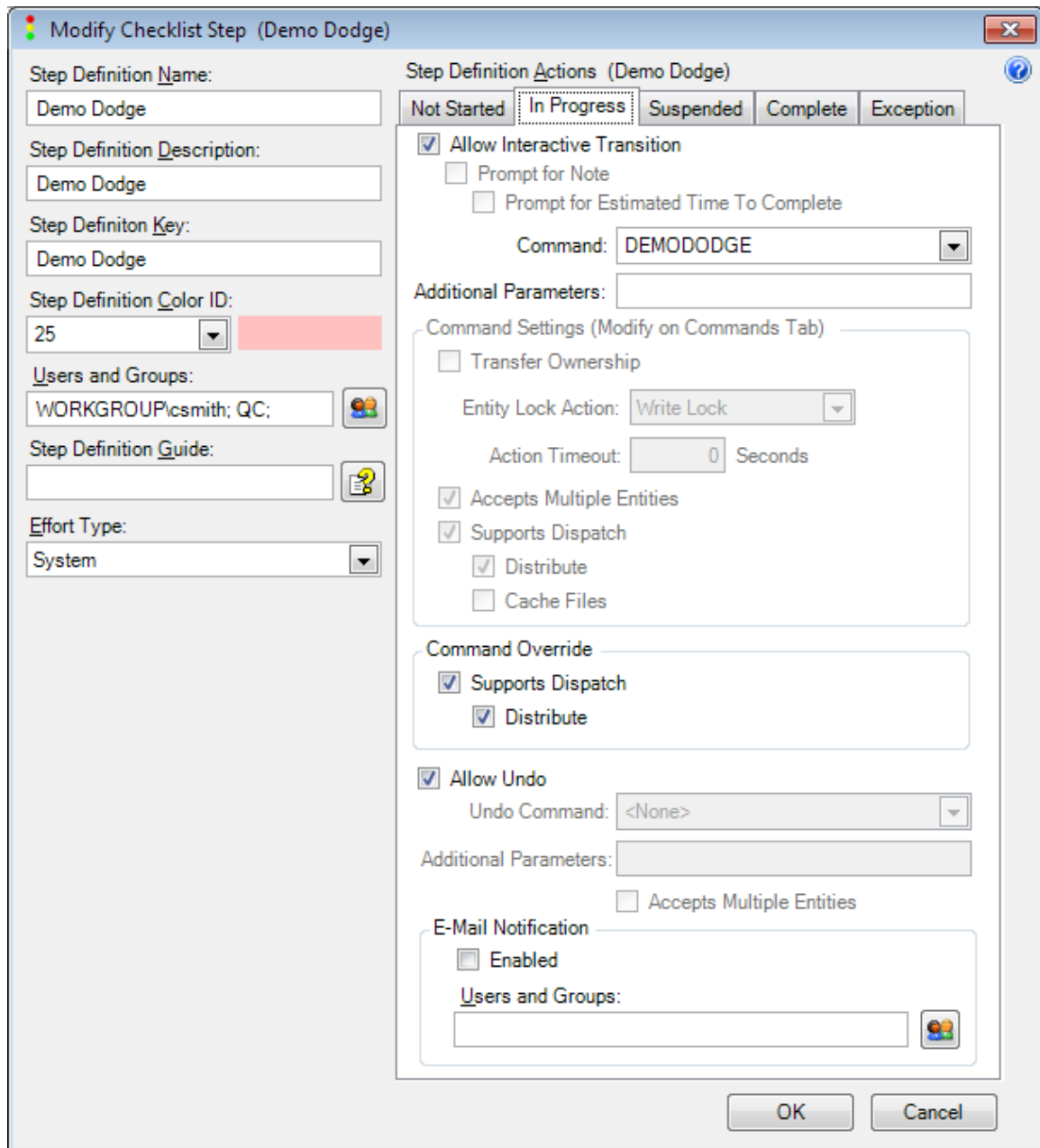


Figure 9-5: Modifying Transition Actions

The function of each option is detailed in Table 9-1

Table 9-1: Checklist Transition Parameters

Function	Description	Set From
Allow Interactive Transition	Allow a user to set this state from the Checklist Processing toolbar in GeoCue Client	Here
Prompt for note/Estimated Time to Complete	Prompts the user for completion status and %Complete. Should only be set for interactive commands	Here
Command	The command that this step will fire (can be None for Prompting steps)	Here
Command Settings	Various settings for executing the associated Command	Command Tab
Command Override	Allows you to disable dispatch mode for this instance of a command that has Dispatch Supported enabled.	Here
Allow Undo	Allows the user to set this state back to Not Started in the GeoCue Client Checklist processor	Here
Email Notification	Specifies that an email message should be sent to specified GeoCue Users and/or Groups when this transition occurs. Note that you must configure email services using the GeoCue Server Manager.	Here

9.3 Checklist Step Master Color Table

Checklist steps can assume one of 62 colors. These 62 colors are defined in the Master Checklist color table. The master color table is accessed from **Edit Master Color Table...** button on the Checklist Steps dialog tab. This will invoke the Edit Master Color Table dialog (Figure 9-6). To change a color definition, either select the drop-down tab for a simple color picker or press the “Color +” button to access the advanced color picker.

NOTE: Changing a particular master color will change that color for all instances in which that particular *index* is used, *system-wide*.

Therefore, it is a good idea to modify this table only when you are first setting up GeoCue. To modify colors of checklist steps in a particular Checklist, you can override the defined step color.

In all cases, you can only select from the variety of colors that are contained in the Master Color Table.

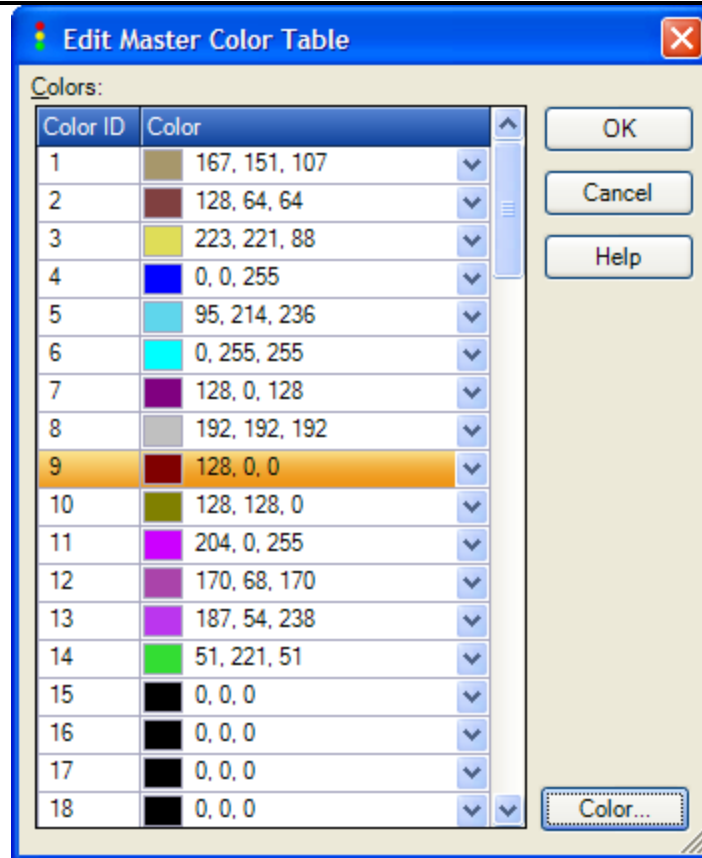


Figure 9-6 Checklist Master Color Table editor

10 Checklists

Checklists are collections of Checklist Steps that are associated with Entities. Effective with GeoCue 7.0, you can modify most aspects of Checklists.

You can also construct entirely new checklists and add those checklists into System supplied environments. Thus, for example, if you need three Process in TerraScan steps that you want to label “Classify Ground”, “Classify Vegetation” and “Set Model Keypoints” you can accomplish this by building a new checklist and associating that checklist with LAS Working Segments.

10.1 Modifying a System Defined Checklist

First select the desired checklist in the top table (*Checklists*) on the Checklists tab of Environment Builder. This will display the associated checklist steps in the second table, *Assigned Checklist Steps* (Figure 10-1).

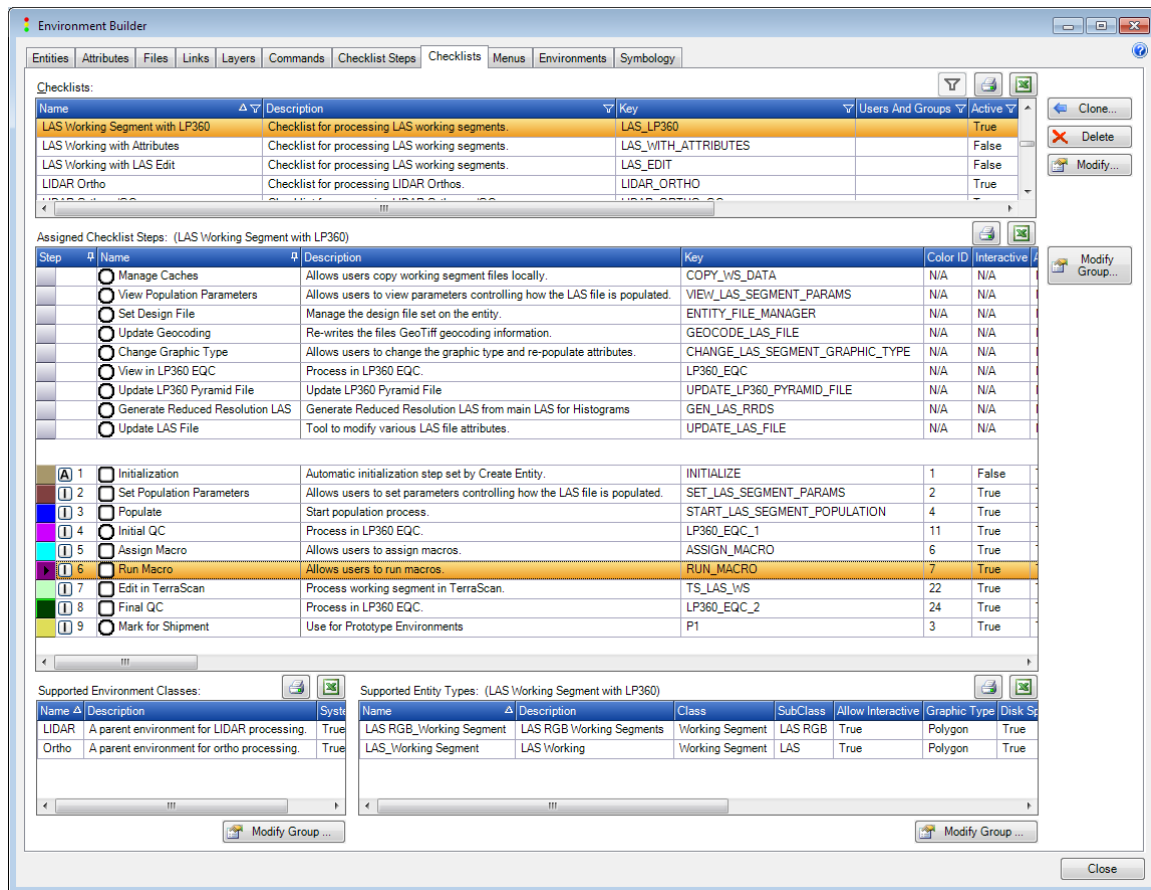


Figure 10-1: The Checklist tab of Environment Builder

You can modify most parameters of a system-defined checklist by pressing the **Modify Group** button to the right of the *Checklists* table: This will display the Modify Assigned Checklist Steps dialog (Figure 10-2).

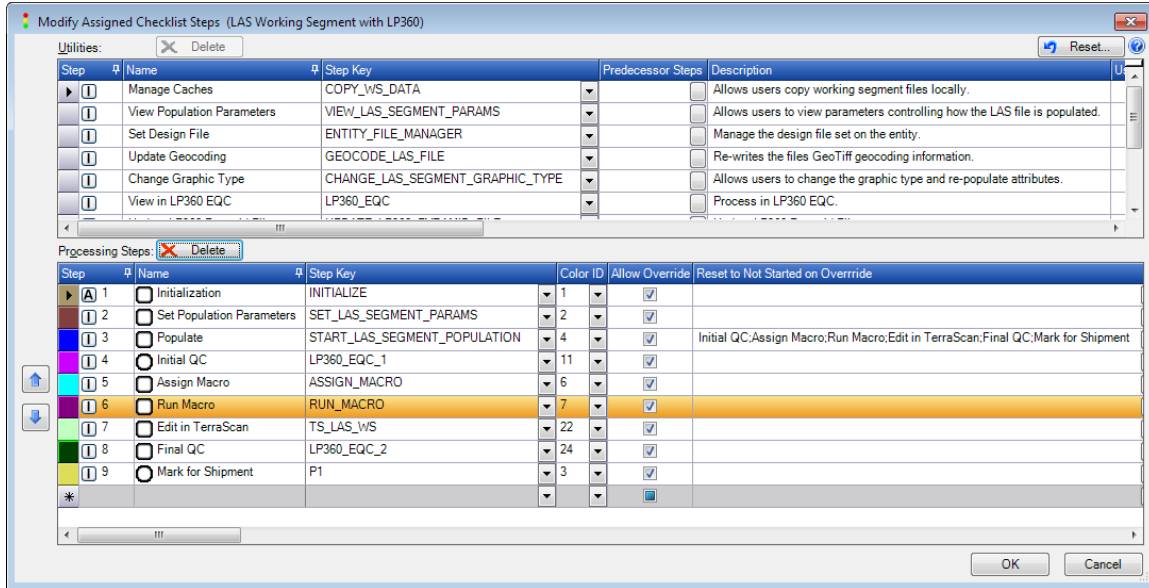


Figure 10-2: Modify Assigned Checklist Steps

The Modify dialog allows you to “edit in place.” After performing modifications, press **OK** to apply.

The columns (moving left to right) and their functions are listed in Table 10-1.

Table 10-1: Modifying Checklist Functions

Column	Function	Notes
Step - Color	The step color that is displayed by GeoCue Symbology	Read only – Set via the Color ID column
Step - Symbol	“A” represents an Automatic (Batch) step whereas “I” is interactive (fired by the user).	Read Only
Name	Square represents a Mandatory step. Round represents an Optional step.	You can rename the step by editing in the name field. This overrides the name specified in the Checklist Step area of Environment Builder.

Column	Function	Notes
Step Key	Step Key	This is the unique GeoCue key assigned when you create a step. This is where you actually select the step that will be executed. Thus this is the first field that must be edited when building a new checklist or adding a step
Color ID	Override the Checklist Step default color	Pick the desired color from the drop-down.
Allow Override	Allow the user to enter this step, provided its Predecessor conditions are met, by using the Override Step Sequence button on the Checklist Toolbar	Generally used to do out-of-sequence processing when things go awry. An example might be the need to repopulate working segments in a LIDAR flow. The step will not enable if <i>predecessor</i> conditions are not set.
Reset to Not Started on Override	You can specify one or more steps in the Checklist. These steps will be set back to their Not Started status if this step is executed via the Override Step Sequence button on the checklist toolbar.	This function allows you to ensure, in your state logic, that the user does not become confused when stepping back in a checklist. An example would be setting Populate to Not Started if Set Population Parameters is run via an override after Populate had already been successfully run.
Reentry Allowed	This flag specifies (if checked) that this step can be executed again (if it is the target another step).	This function is used for “fire once” scenarios. For example, you might group three steps and allow the user to execute them in any order. You can use this function to prevent the user from running the same step twice, even if its predecessor condition is valid.
Predecessor Steps	One or more steps that must be in the COMPLETE state before this step can be executed.	<i>This is the most fundamental of the Checklist transition rules. It cannot be overridden by any checklist action.</i>
COMPLETE Targets	These are the steps that will potentially be enabled when this step transitions to Complete.	Steps will not enable if their predecessor condition is not met or they have already been transitioned to complete and their Allow Reentry flag is not set.

Column	Function	Notes
Select Step	This is the step that will be selected from the list of COMPLETE Targets after the associated step completes.	If the Select Target cannot be executed (due to predecessor requirements or the Reentry flag), no step[will be Selected.
ERROR Targets	These are the steps that will enable if the executable associated with this step crashes.	
FAIL Targets	These are the steps that will enable if the user declares a Failure. This is usually initiated via the Fail option of the Checklist Step Completion dialog.	
WARNING Targets	These are the steps that will be enabled if the executable (or exist dialog) associated with this step declares a Warning.	
INTENTIONALLY SKIPPED Targets	These are the steps that will enable if the user sets the state of the current step to Intentionally Skipped.	
Interactive	Checking this box allows the user to interactively execute this step	The step must be an interactive step as defined in the Step Library
Optional	Checking this box causes the Step ion to display as round (optional) rather than square (required)	Note that this is for appearances only. It has no programming affect on the step.
Intentional Skip Required	This option forces the user to press the Intentional Skip button on the checklist processing toolbar if they want to move past this step without executing.	This effectively sets up an optional checklist step that records an audit trail even if someone does not run the step. It is useful when you need the user to deliberately think about not applying an operation.

Column	Function	Notes
Auto Run Next Step	If this step successfully completes, the COMPLETE Target will automatically move to the In Progress state.	The associated executable of the target step must be an External command. All predecessor conditions must be met.
Same Machine	Used in conjunction with Auto Run Next Step and the Command Dispatch System. If enabled, the auto run step will be queued to run on the same machine as this step.	This is used in application where (for performance reasons) step n writes data to a local resource. For maximum performance, step n+1 needs to run on the same machine.
Description	Free form text that displays in the description field of the Checklist in GeoCue Client	
Users and Groups	Allows you to set permissions on a per step basis.	
System	If true, prevents many fields from being edited	
DPMS Enabled, Name and Key, Set complete on DPMS Import	If set, this step can be used in a GeoCue Distributed Project Management System status environment.	
Effort Type	Interactive or System. Determines which category GeoCue uses for Earned Value Management time tracking	Read only – set in the Checklist Step editor
Auto Budgeted Effort Enabled	Causes GeoCue to automatically compute Budgeted Effort for the entity associated with this checklist when the entity is created.	

Column	Function	Notes
Auto Budgeted Effort Type	Absolute = the Auto Budgeted Effort Value is assigned to the step Computed = the Auto Budgeted Effort is computed based on the size of the associated entity	The actual values are computed and assigned when an entity with this checklist assigned is created.
Auto Budgeted Effort Value	Either an absolute value or a multiplier as determined by the Auto Budgeted Effort Type field	
Auto Budgeted Effort Units	Specifies the units of the Auto Budgeted Effort Value when using Multiplier mode.	GeoCue automatically converts the Auto Budgeted Effort Value to the correct value based on the units specified in this field and the units of the Layer on which the associated entity is being created.

When a checklist is being evaluated by the GeoCue State Engine, the order of priority is as follows:

1. Predecessor – If a step’s predecessor step(s) is not Complete, the step cannot be executed under any circumstances (i.e. it cannot be overridden)
2. If the Override Step Logic button is pressed on the checklist processing toolbar in GeoCue Client, the Predecessor step(s) is/are Complete and the Allow Override option has been checked in the Checklist configuration, the step will enable. Note that this will override the Allow Reentry flag

10.1.1 Assigning a Checklist to an Environment Class

The next step in the process is assigning the checklist to *environments*. In the lower left of the Environment Builder Checklists tab is a table entitled *Supported Environment Classes*. This table lists all GeoCue environments to which the currently selected checklist has been assigned.

If you select our new checklist, New LAS, in the *Checklists* table at the top of the tab (it may already be selected from our previous work), you will see that this checklist has been assigned to the LIDAR environment class. This assignment occurred because we “cloned” the LAS Working Segment checklist to serve as a template for our new checklist and LAS Working Segment was assigned to the LIDAR environment class.

You can modify environment class assignments by pressing the **Modify Group** button under the *Supported Environment Classes* table. This will invoke the dialog of Figure 10-3. The left table in this dialog (*Available Environment Classes*) lists every environment class in your GeoCue database that is not currently assigned to the checklist (the checklist on which you are working is listed, parenthetically, in the title bar of the dialog). The table on the right side of the dialog (*Supported Environment Classes*) lists all environment classes to which the checklist is currently assigned.

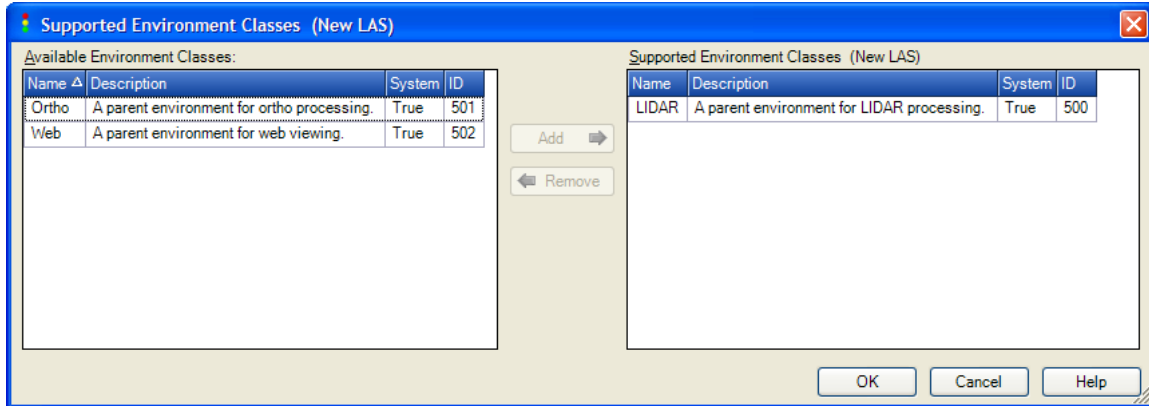


Figure 10-3 The Supported Environment Classes assignment dialog

Move the desired environment class by selecting it and pressing the appropriate direction button. Since our checklist is already assigned correctly, just press **OK** to dismiss the dialog.

10.1.2 Assigning a Checklist to an Entity

Assigning a checklist to an Entity is similar to assigning a checklist to an environment. The currently assigned entities are listed in the *Supported Entity Types* table. Press the **Modify Group...** button under this table to modify assignments. This will display the dialog of Figure 10-4.

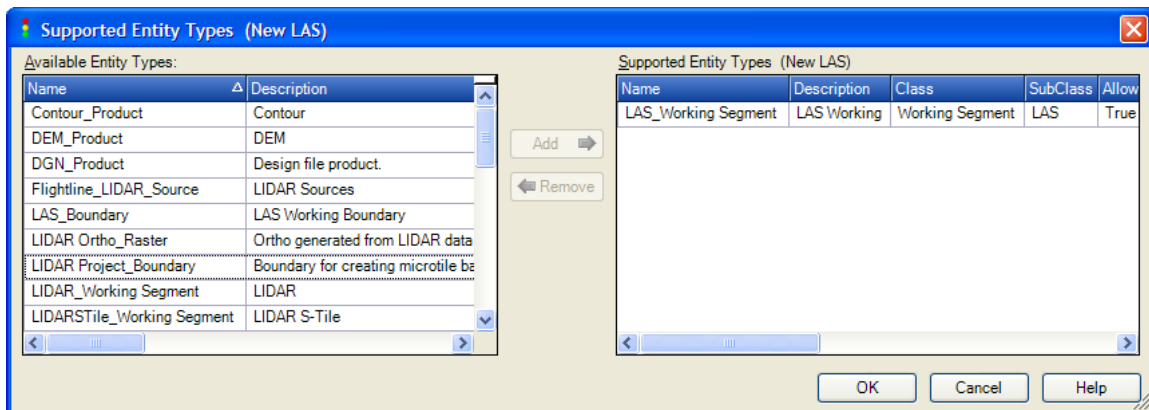


Figure 10-4 The Supported Entity Types assignment dialog

Again, since we used the Clone method to create our new checklist, it has already been assigned to the desired Entity. Press **OK** to dismiss the dialog.

At this point, all of the steps required to construct and assign a new checklist are complete. The new checklist is now a proper member of the Checklist library and will be available for assignment with the same status as a system delivered checklist.

11 Menus

The *Menus* tab of Environment Builder displays the menu management interface (Figure 11-1). Selecting a particular menu from the *Menus* table will display that menu in the lower section of the tab. Note that this menu preview is fully functional in terms of displaying submenus. Try this out by selecting the LIDAR Project Menu and then clicking on the various menu buttons in the Menu Preview pane. Note that when you click a command item within the menu tree, the command information is displayed in the Menu Item Settings section of the dialog (in our example we browsed to User Manager).

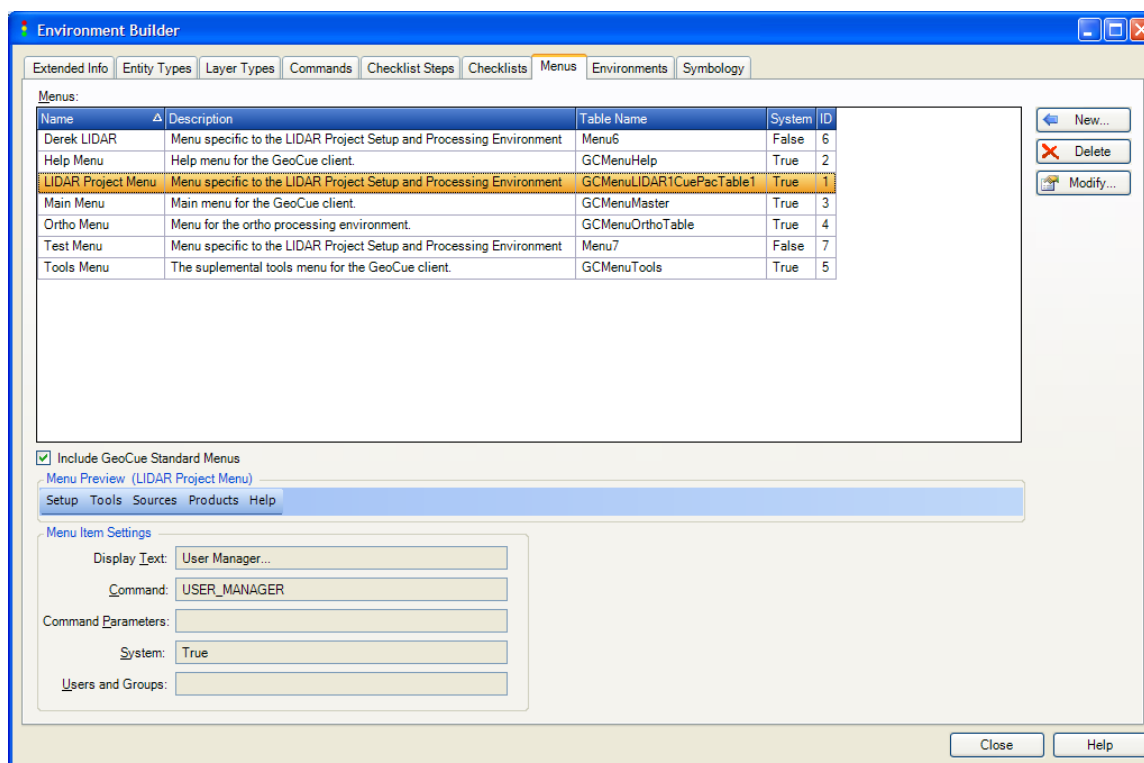


Figure 11-1 The Menus tab of Environment Builder

GeoCue Environment Builder provides a fully interactive, graphical menu builder. You can use the menu builder to modify existing menus or to create completely new menus.

In general, a menu is a composite of the GeoCue standard menu and the environment menu. To see only the portion of a menu that is defined by the selected menu, uncheck the *Include GeoCue Standard Menus* checkbox option in the preview section.

11.1 Modifying a Menu

A menu is modified by selecting the desired menu in the *Menus* table and pressing the **Modify...** button. For this example, select the LIDAR Project Menu in the *Menus* table

and press **Modify...** This will display the Modify Menu dialog with the selected menu loaded (Figure 11-2).

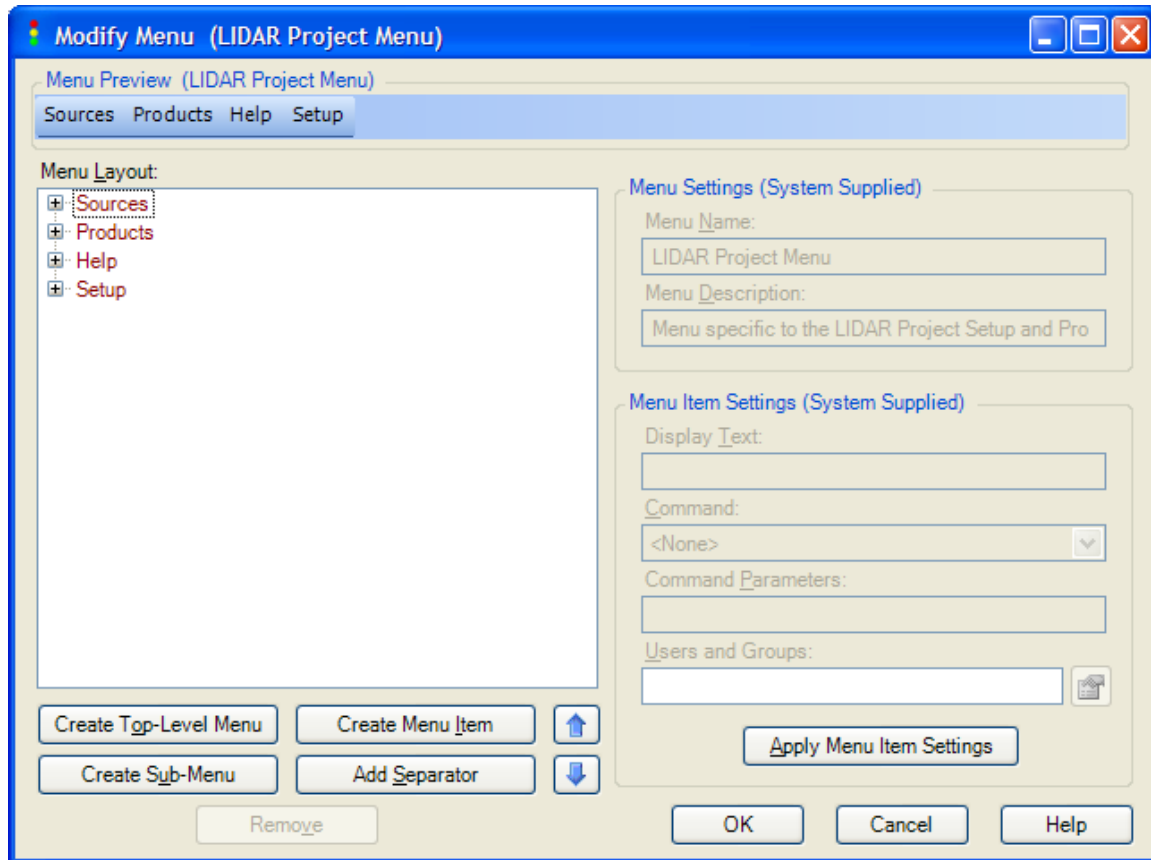


Figure 11-2 The Modify Menu dialog

Menus are edited via the tree view in the left pane of the menu editor dialog. You can expand and collapse this tree by clicking the “+” and “-“ nodes on the tree, similar to a directory display in Windows. Figure 11-3 depicts the LIDAR Project Menu fully expanded. Note that clicking on a terminal entry in the tree view will display the associated parameters in the right hand section of the dialog.

As you make modifications to the menu, you can preview its exact look and feel via the menus at the top of the dialog. To update this view with your current changes, press the **Apply Menu Setting Button** at the lower right of the dialog. This will update the preview menu with the latest changes in the tree view.

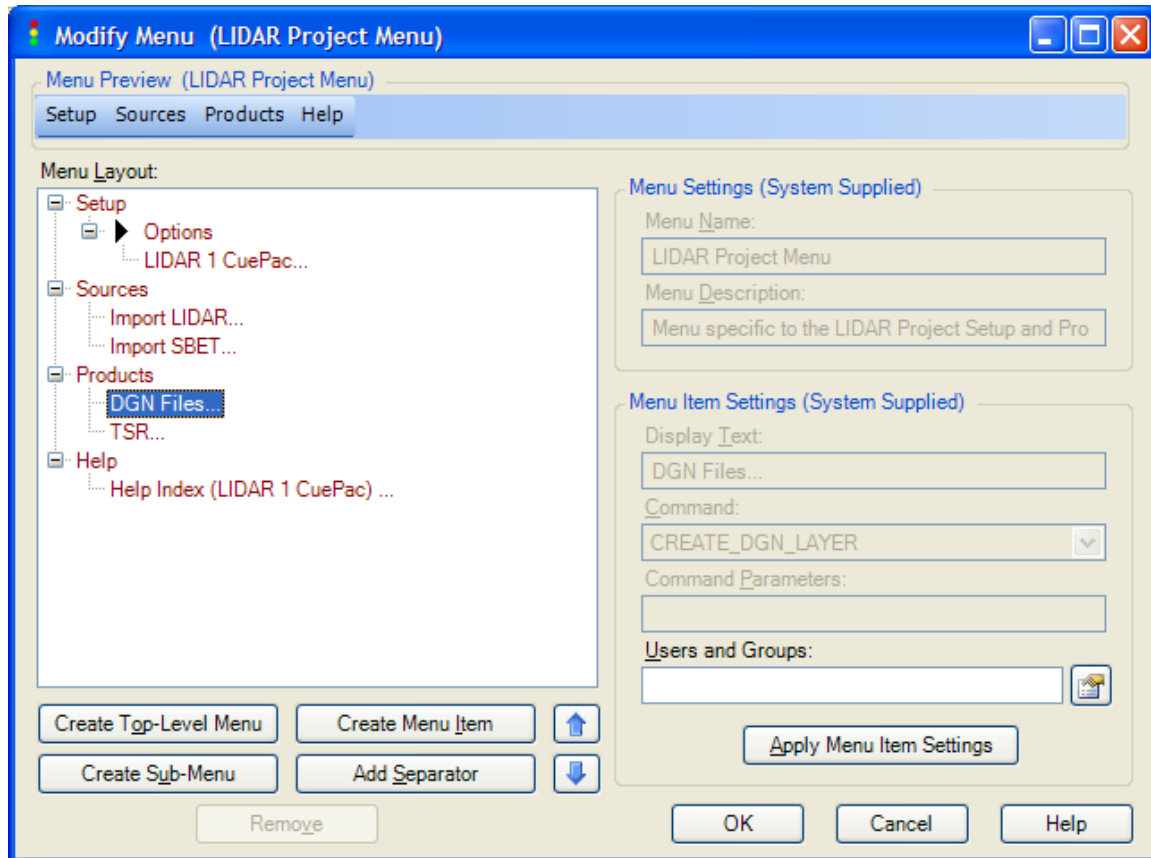


Figure 11-3 LIDAR Project Menu fully expanded

Menus are modified by the set of command buttons below the tree.

11.1.1 Modifying System Menus

Note that for a System menu you can:

- Move menu items within categories
- Add/remove separators
- Add new sub-menus
- Add new Menu Items
- Assign access permissions at any command node

You cannot:

- Remove menu items
- Move a menu item into a different category
- Rename a menu entry
- Modify any command parameters associated with the menu entry

Note that you can set access permissions at *any* command node (menu item) in the menu tree. Thus if you want only members of the Product Generation group to be able to

access the **TSR...** command, create a Product Generation group using GeoCue User Manager and then assign this group to the **TSR...** menu item.

11.1.2 Creating New Menus

You can create entirely new menus with Environment Builder. To create a clone template of an existing menu, select that menu in the *Menus* tab of Environment Builder and then press the **New...** button. You will enter the Modify Menu dialog with menu prepopulated with all items of the clone source. For example, in Figure 11-4 we selected the LIDAR Project Menu and selected **New...** Note that we must supply a unique, new menu name in the Menu Name field. Also notice that all fields can now be edited.

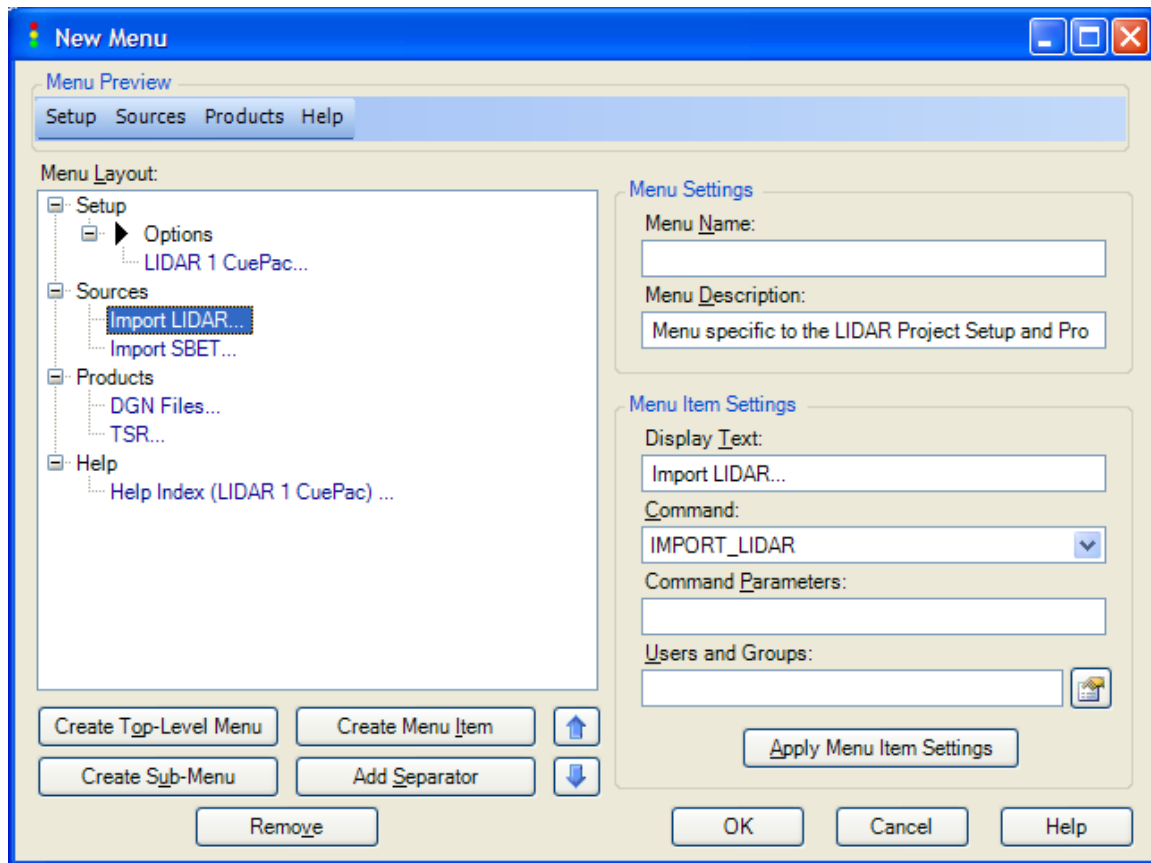


Figure 11-4 Creating a new menu by Cloning an existing menu

Even if you are not programming in GeoCue, you can build custom menus by accessing the existing list of GeoCue commands.

12 Environments

Environments define workflows that can be applied to GeoCue Projects. An environment defines a collection of layers, checklists and menus that are used to define a workflow. Thus Environments can be thought of as segregation categories used to organize production tools.

13 Symbology

The *Symbology* tab in GeoCue allows you to define symbology for new data types that you create using Environment Builder and also to set the symbology of existing entities.

Invoke Environment Builder and select the *Symbology* tab. If you have not selected an Environment to modify, your display will resemble Figure 13-1.

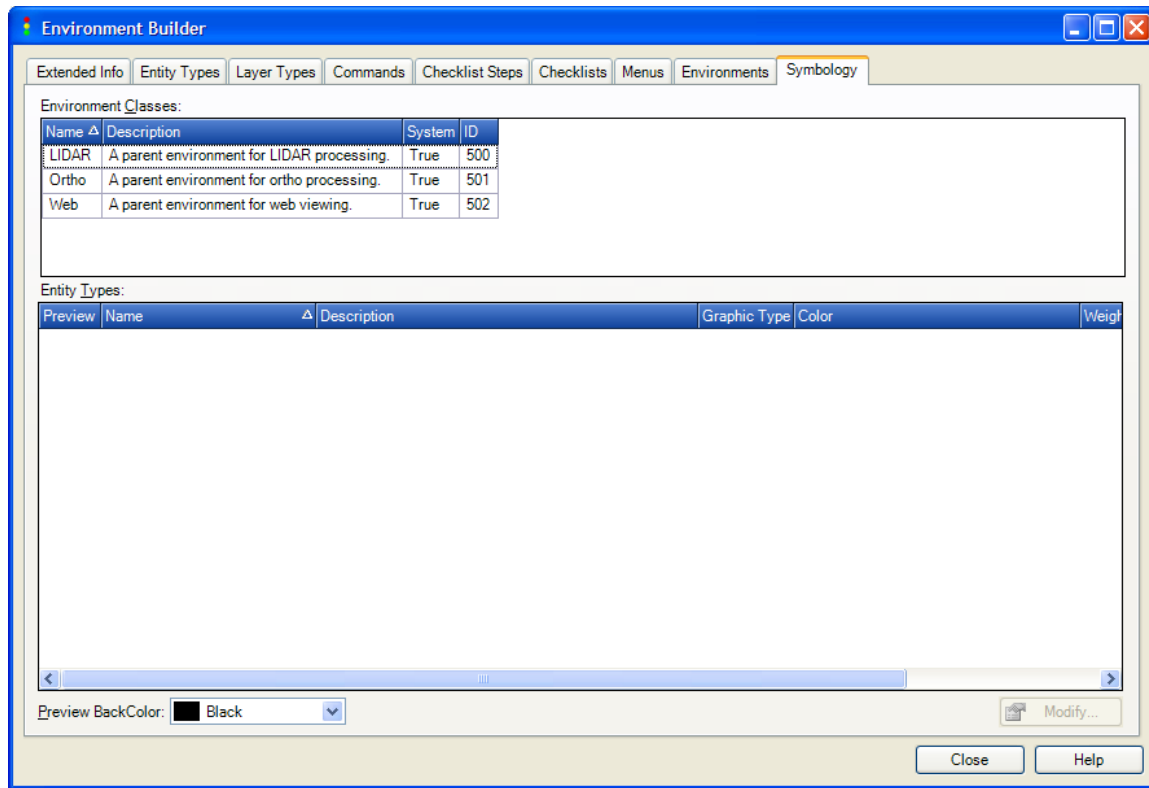


Figure 13-1 Symbology Editor prior to selecting an Environment

Note – Symbology is set system-wide on a per-Environment Class basis. This means that if you change the color of, for example, SBET entities in the LIDAR Class Environment, these changes will not affect a different Environment Class (say Ortho). Symbology is set at the Environment Class level as opposed to the Environment (subclass) level. Thus if you change a symbology in the LIDAR Class Environment, it will assume these values in all sub environments under the LIDAR Class.

Select the Environment Class whose symbology you wish to view and/or modify. For our example, we will use the LIDAR environment class. After selecting an environment, the lower pane of the symbology tab will be populated with all entities currently associated with the selected Environment (Figure 13-2).

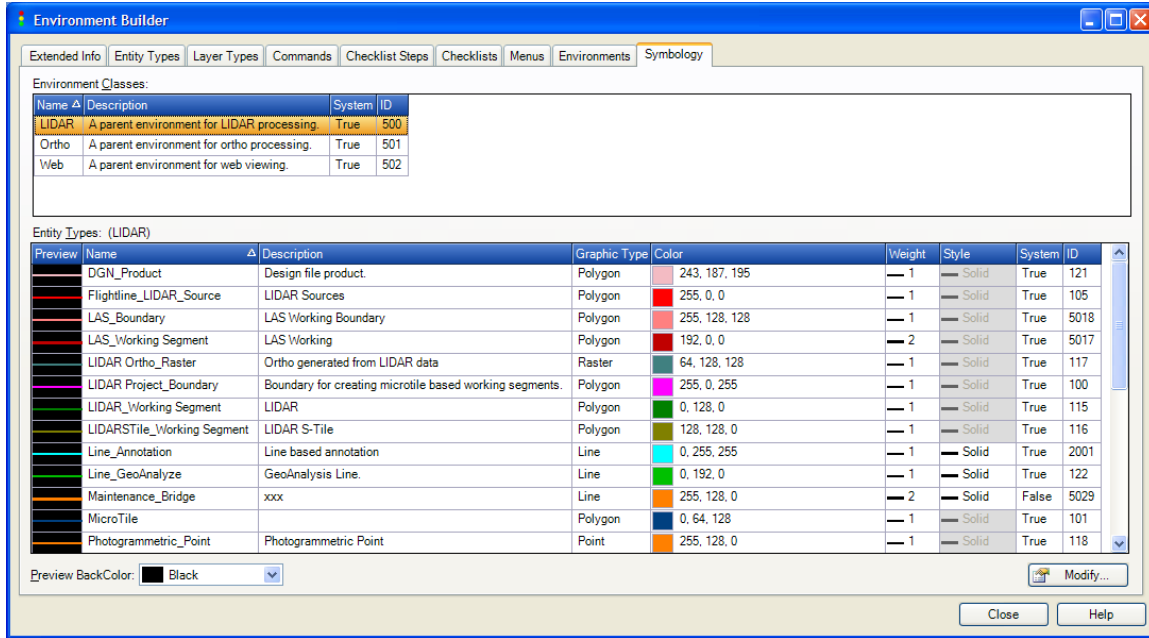


Figure 13-2 LIDAR Environment Symbology

Note that you can change the “Preview Back Color” to visualize how the symbology will appear on different screen color settings. To modify symbology, press the **Modify...** button in the lower right of the pane. This will bring up the symbology section of the tab with modification enabled (Figure 13-3).

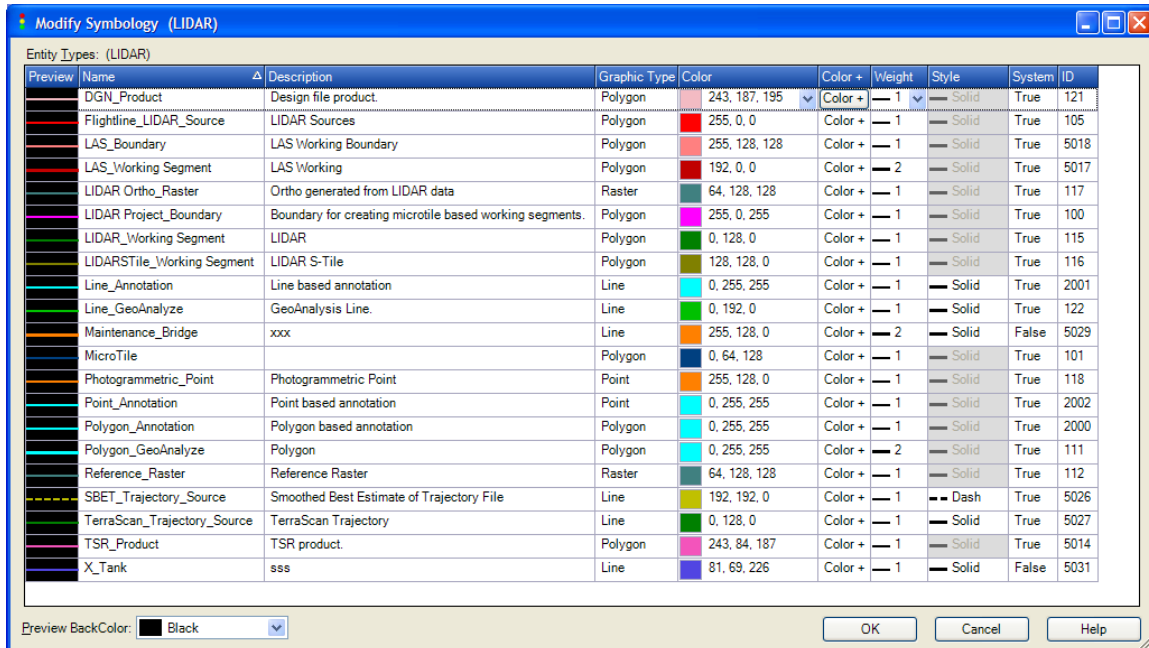


Figure 13-3 Symbology Editor

To modify an entity, select the row that you wish to edit.

NOTE: Symbology modifications will not take affect for open projects. Simply close the project and immediately reopen. This forces the layer symbology to be reloaded from the GeoCue database.

13.1 Colors

To modify the color of the entity, select either the color drop-down selection or press the “Color +” button.

13.1.1 Basic Color Editing

For basic color editing, click the color drop-down tool in the row of the entity whose color you wish to modify. This will display the basic color editor dialog (Figure 13-4). Select any color in the dialog by clicking on the desired color from any of the three tabs.

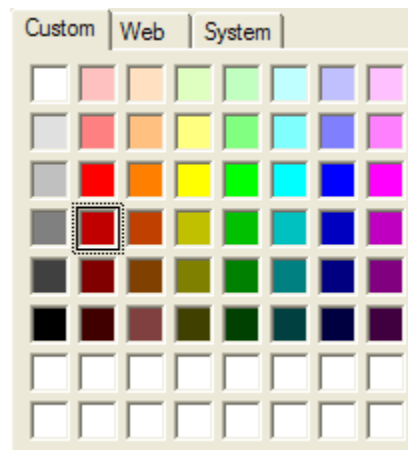


Figure 13-4 Basic Color Editor

You can define a new color in this dialog by right clicking in one of the lower two rows on the Custom tab (these are initially set to undefined). Right-clicking one of these spaces will invoke the standard Windows color definition dialog. Create the desired color in this dialog and press OK.

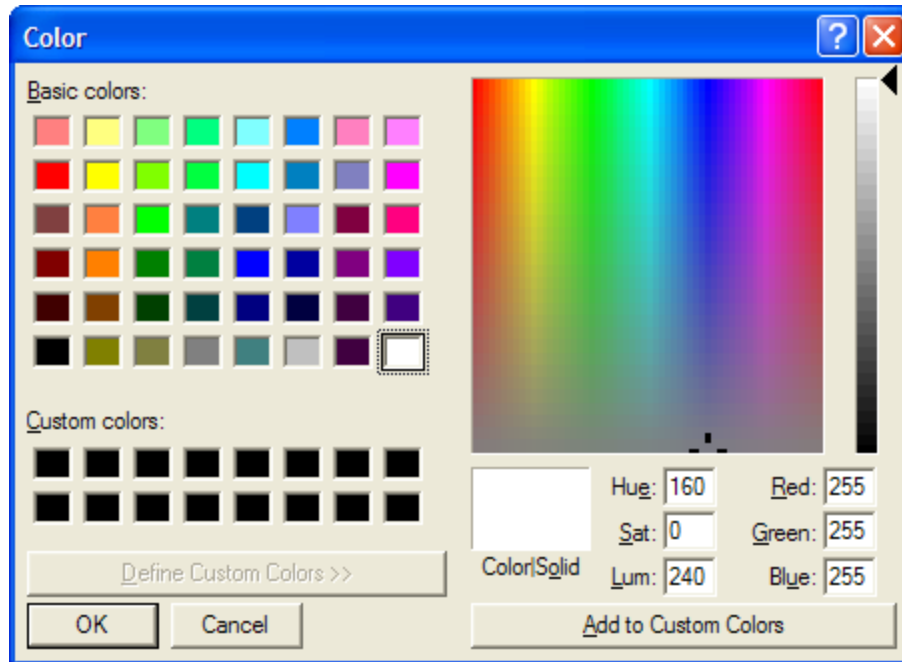


Figure 13-5 Windows Color Definition dialog

13.1.2 Color +

An alternative color selection dialog is available by pressing the Color + button in the selected symbology row rather than the color drop-down selector. This will bring up the dialog of Figure 13-6. In addition to providing an alternative color selection method, this dialog allows you to “copy” a color from anywhere on your display. This is particularly useful if you want to assign a color to an entity that is exactly the same color as assigned to a different entity. To use this method, left click and hold in the gray bar on the dialog that contains the prompt string “Click here and drag to any location to capture a color from the screen.” This will display an eye dropper. As you drag the eye dropper around the screen, you will see the color selection box (just under the **Cancel** button) take on the color under the eye dropper. After choosing the desired color, press the **OK** button.

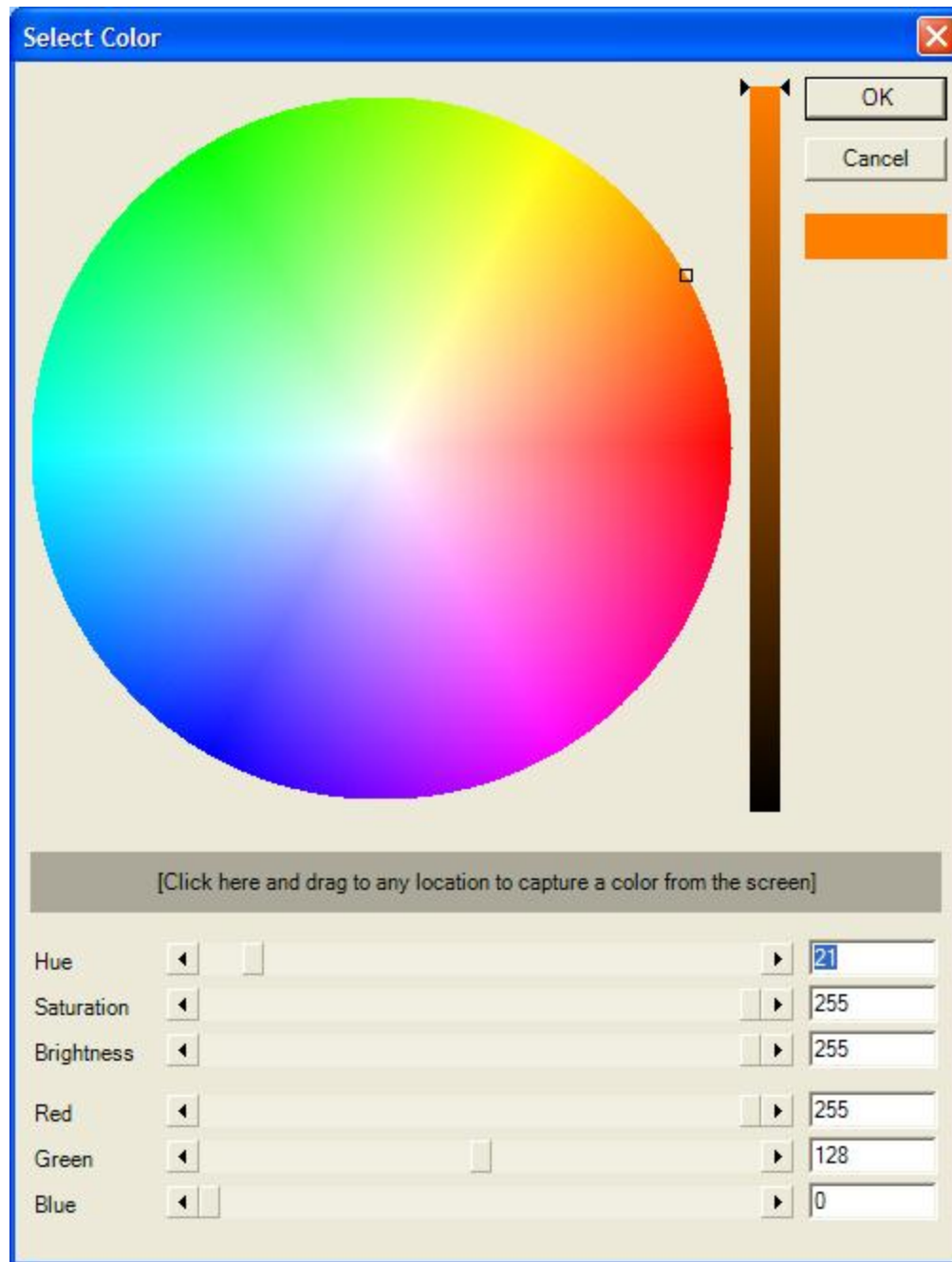


Figure 13-6 The Color + dialog

NOTE: We strongly recommend that you do not choose gray level colors (black, white, shades of gray or yellow) for your symbology color. These will generally be hidden by your selected Map View background color, the selection color or the Working Set color.

13.2 Line Weight

Change the Line Weight of an entity by selecting the desired weight from the drop-down selector.

13.3 Line Style

Select the desired line style by selecting the desired style from the drop-down line style selector. Note that line style can only be set for lines (not polygons).

13.4 Applying Changes

Changes that you make with the symbology editor do not take affect until you press **OK** on the editor dialog. If you press **Cancel**, your changes will be discarded.

14 Set Attributes Dialog

GeoCue contains a generic *Set Attributes* dialog that can be used for configuring workflows without the need to use the GeoCue Software Developer’s Kit (SDK) for designing a custom data input dialog. This feature is useful for quickly configuring workflows where complex data entry is not required. An example would be inserting a command line driven application into GeoCue that requires input parameters.

Using the Set Attributes functionality of GeoCue involves the following steps:

1. Define the Entity (if it does not already exist)
2. Define the Attributes that will be set using the Set Attributed function
3. Associating the Attributes with the Entity
4. Clone the Set Attributes Checklist Step
5. Create a Checklist for the Entity (or modify an existing Checklist)
6. Add a clone of the Set Attributes factory delivered Checklist Step to the Checklist
7. Select this new checklist when creating entities

Defining Entities was discussed in a previous chapter and hence will not be repeated here.

We will use a very simple example of adding several fields of metadata to an LAS Working Segment.

14.1 Defining Attributes

The definition of Attributes was discussed in a previous chapter so we will concentrate on the features relevant to the Set Attributes functions.

As usual, Attributes are created/modified using the Attributes tab of Environment Builder.

We will create a new Attribute Group called “LAS Metadata.” This is accomplished by using the *New...* button at the upper right of the Attributes tab.

NOTE: Recall that if a row of a table in Environment Builder is *Selected*, the *New...* button changes to a *Clone...* button, making a copy of the selected row. To unselect a row, hold down the **Ctrl** (Control) key while selecting the selected row.

With the newly created LAS Metadata row selected, press the *Modify Group...* button in the lower section of the Attributes tab. Create two new fields:

- A text field called “Topography” with a default value of “Forest”

- An integer 32 field called “Difficulty”

Two fields in the Modify Group Attributes dialog control the visibility of the attributed in the Set Attributes dialog (Figure 14-1):

- Interactive Edit – Enables the field for editing in the Set Attributed dialog
- Interactive Edit Groups – This is a user defined tag (simply an ASCII string that you make up) that allows you to control the visibility of Attributes in the Set Attributes command based on a command line argument.

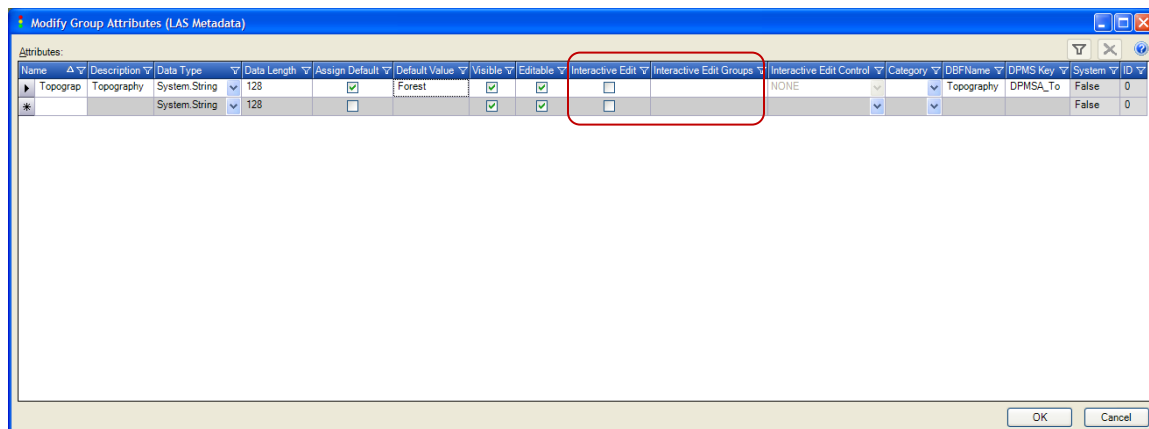


Figure 14-1: The Interactive Edit and Interactive Edit Groups fields

For this example, check the Interactive Edit box (if this box is not checked, the field will *not* appear in the Set Attributed dialog) and leave the Interactive Edit Group field blank. Note that the Category field performs the standard function of assigning the attribute to a Tab in the properties pane. Set this field to “Topo.” Do not set a default value for “Difficulty.”

HINT: If you check the Assign Default box but do not enter an appropriate value for the default (for example, leaving the field blank for an integer value), you will receive an error message when you exit the dialog with the offending row selected.

The dialog, just prior to exiting, is depicted in Figure 14-2. Press the **OK** button to save your new Attributes.

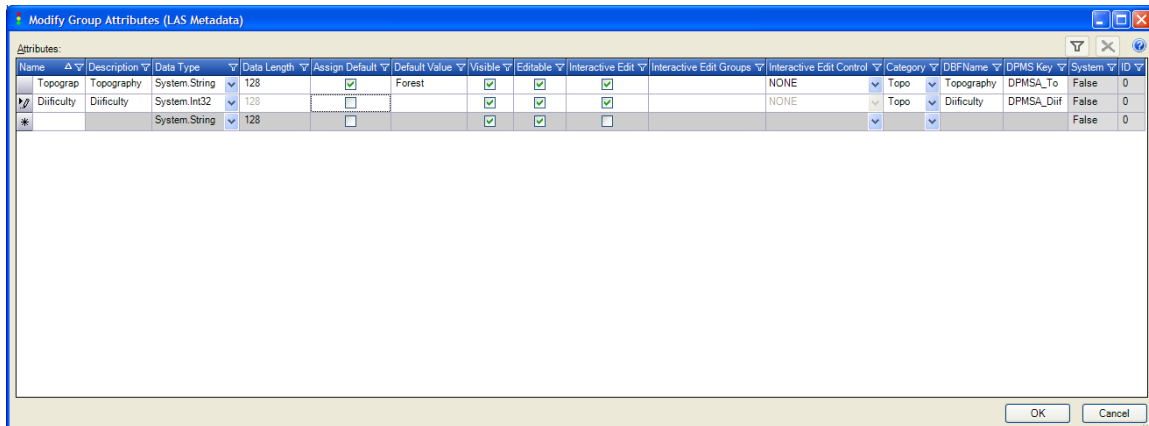


Figure 14-2: The example data just prior to commitment

14.2 Associating the Attributes with an Entity

After defining an Attribute Group, it must be associated with an Entity. This operation was discussed in a previous chapter and hence is just briefly repeated here.

For our example, we will associate the new “LAS Metadata” attribute group with the standard “LAS Working Segment” entity used in the LIDAR 1 CuePac. Note that you while you cannot modify the system supplied attribute groups of system supplied entities, you can add new groups to these entities. This is the standard way of extending system supplied environments.

On the Entity tab of Environment Builder, perform the following operations:

1. In the Entity Classes pane, select the Working Segment class
2. In the Entity Types pane, select the “LIDAR_Working Segment” row
3. Select the Attributes tab in the lower section of the dialog (you will see a single Attribute group assigned).
4. Press the **Modify...** button under the Attributes pane. This will invoke the Assigned Attributes Groups dialog (Figure 14-3).

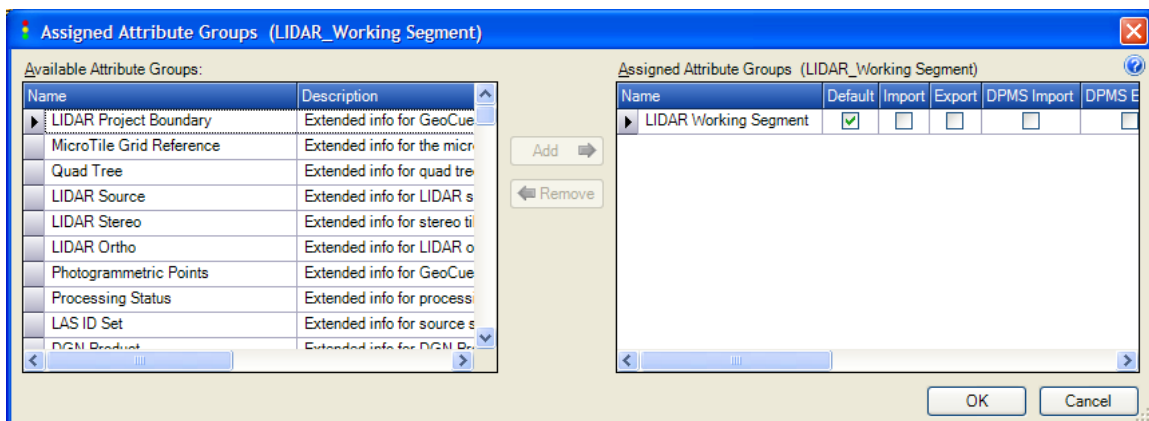


Figure 14-3: The Assigned Attributes Groups dialog

5. Select the newly created “LAS Metadata” group in the left pane and press the **Add** button. This will add the LAS Metadata group to the LAS Working Segment entity type.
6. Press the **OK** button. You should now see two attribute groups listed for the LAS Working Segment

14.3 Clone the Set Attributes Checklist Step

GeoCue provides a library of standard checklist steps under the Checklist Steps tab of Environment Builder. Generally, these steps are *cloned* prior to use in a custom checklist. This process is needed because the settings applied to a particular instance of a checklist (for example, the transition state rules and extra command line parameters) are specific to a particular instance of the checklist step, not to every instance.

For our example, following these procedures:

1. Select the Checklist Steps tab in Environment Builder
2. Select the *Set Attributes* checklist step
3. Press the **Clone...** button in the upper right of the pane. This invokes the dialog of Figure 14-4.

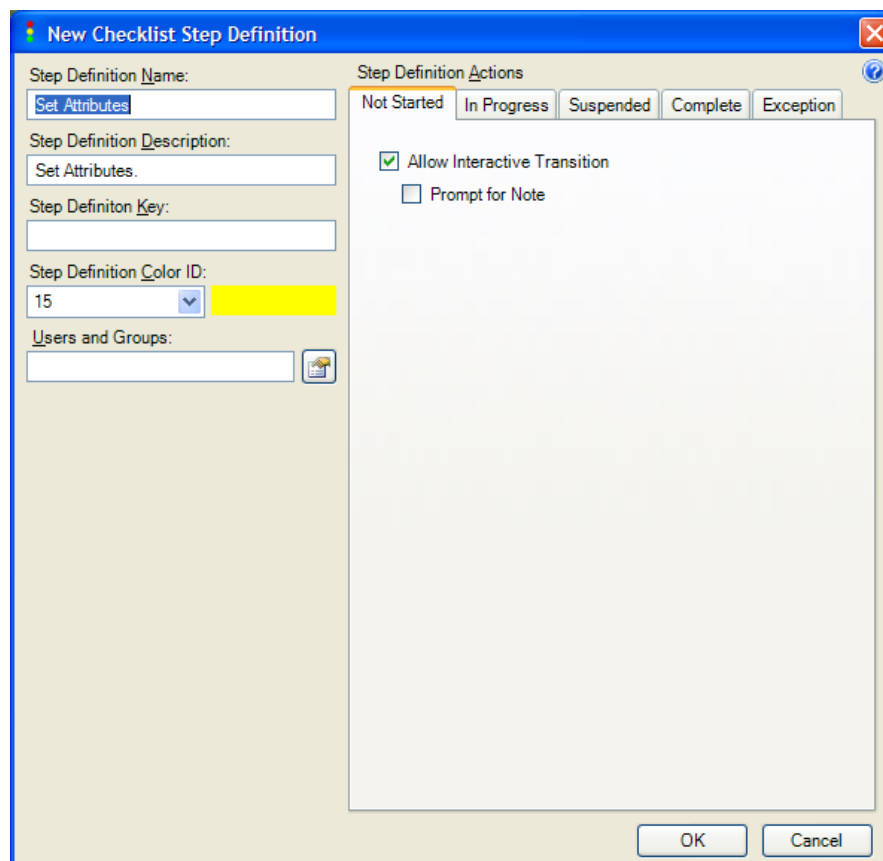


Figure 14-4: The New Checklist Step Definition dialog

4. Set the Step Definition Name to “Set LAS Metadata”
5. Set the Step Definition Key to “SET_LAS_ATTRIBUTES”. Recall that Keys must be system unique.
6. Change the Step Definition Color, if you desire.
7. Press **OK** to apply your settings and exit the dialog

You have now created a new checklist step called “Set LAS Attributes”. You should be able to see this new entry in the Checklist Step pane of Environment Builder.

14.4 Creating a Checklist

It is not possible to modify a GeoCue supplied Checklist (a System Checklist). This is a safety feature that prevents end-users from accidentally corrupting GeoCue supplied data. Thus we will clone the LAS Working Segment checklist to create a new list that we can modify.

Complete the following steps to create the checklist:

1. Select the Checklists tab of Environment Builder
2. In the Checklists: pane, select the “LAS Working Segment” checklist (this checklist has the key “LAS_WORKING_SEGMENT”)
3. Press the **Clone...** button at the right of the Checklists pane. This will invoke the dialog of Figure 14-5.

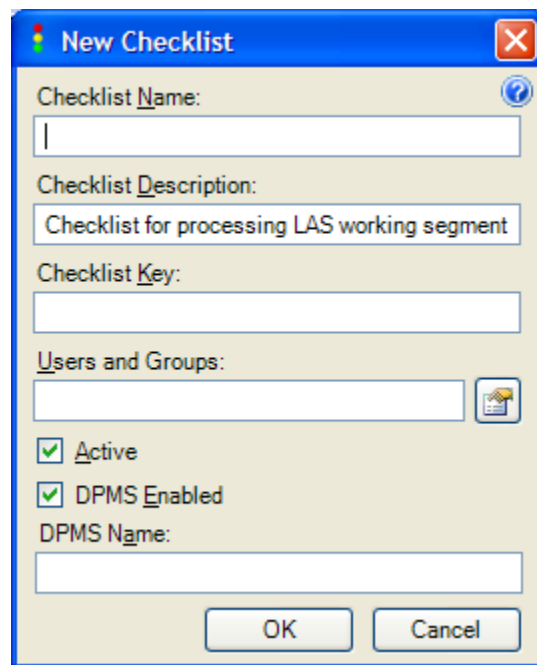


Figure 14-5: The New Checklist dialog

4. Set the name to “LAS Working with Attributes”

5. Set the Checklist Key to “LAS_WITH_ATTRIBUTES”
6. Uncheck the “DPMS Enabled” option
7. Press **OK** to save your new checklist

When you are returned to the Checklists tab, you should have a new entry (that is *selected*) in the Checklists pane called “LAS Working with Attributes.”

14.5 Adding the Set Attributes Step

The next step in the process is to add the previously created Set LAS Attributes checklist step to our new Checklist. Follow these steps to complete this operation:

1. With the “LAS Working with Attributes” checklist selected in the top pane of the Checklists tab of Environment Builder, press the **Modify Group...** button to the right of the center pane. This will display the dialog of Figure 14-6. Note that the dialog title bar will list your checklist name (it is a good idea to verify this to ensure you are modifying the correct checklist).

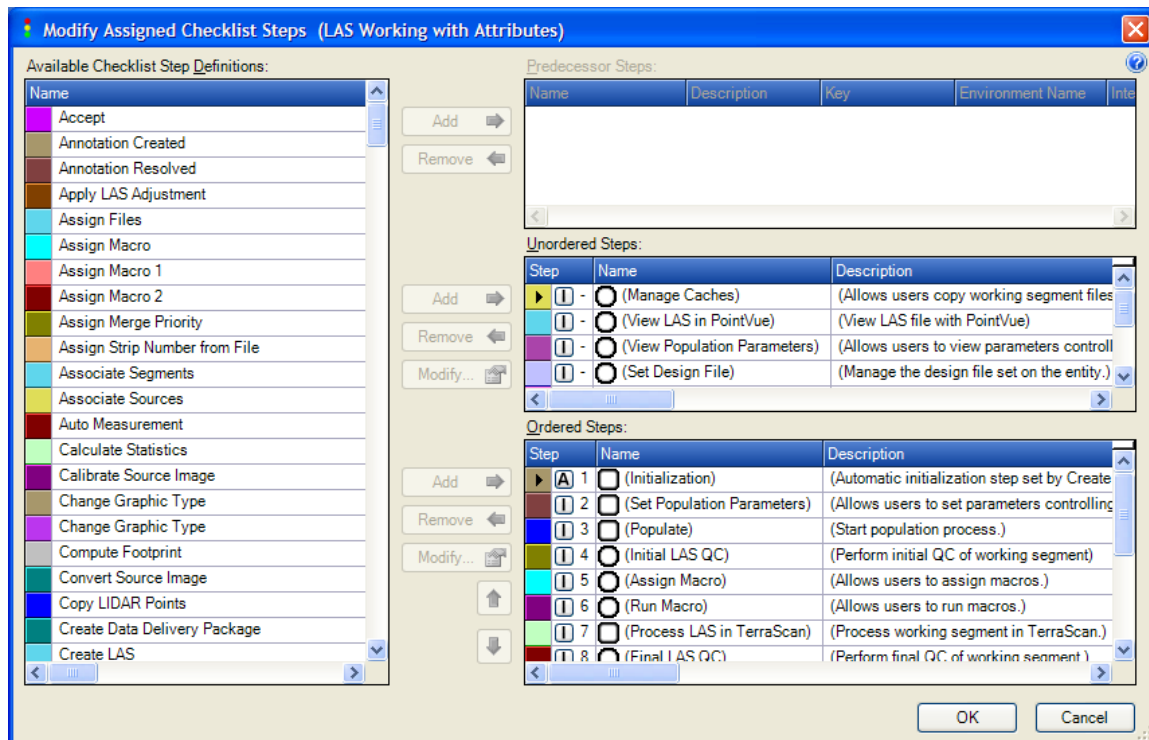


Figure 14-6: The Modify Assigned Checklist Steps

2. In the Available Checklist Step Definitions pane on the left of the dialog, select your recently created “Set LAS Attributes” step.
3. Press the Add button that is immediately to the left of the **Ordered Steps** list. This will place the Set LAS Attributes step at the end of the Ordered Steps list.

4. Select the Set LAS Attributes step in the Ordered Steps pane and press the up arrow (just to the left of the Ordered Steps pane) until the Set LAS Attributes step is the second step in the list (placing the step between the Initialization and Set Population Parameters steps).
5. Press the **OK** button at the lower right of the dialog to commit your modifications.

You now have a new checklist in the Checklist library. Since this checklist was *Cloned*, it has been assigned the entity types and environments of the checklist from which it was cloned. Thus we will not need to make these assignments (they can viewed by selecting the Checklist and examining the lower panes of the Checklists tab).

15 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).

This release of the Environment Builder provides the first set of a powerful family of functions that allow you to customize GeoCue via a simple interactive GUI. Over the next several years a number of enhancements will be included in Environment Builder. The ultimate goal, of course, is that the majority of workflows can be integrated without the need of programming.