# ”GET DECIMATED LIDAR”

USING ARCMAP

The purpose of the “Get Decimated Lidar” program is to retrieve either NCFMP or QL2 Lidar in Bare Earth and Half, One, and Two foot increments for products produced by NCDOT.

# TABLE OF CONTENTS

# GETTING STARTED

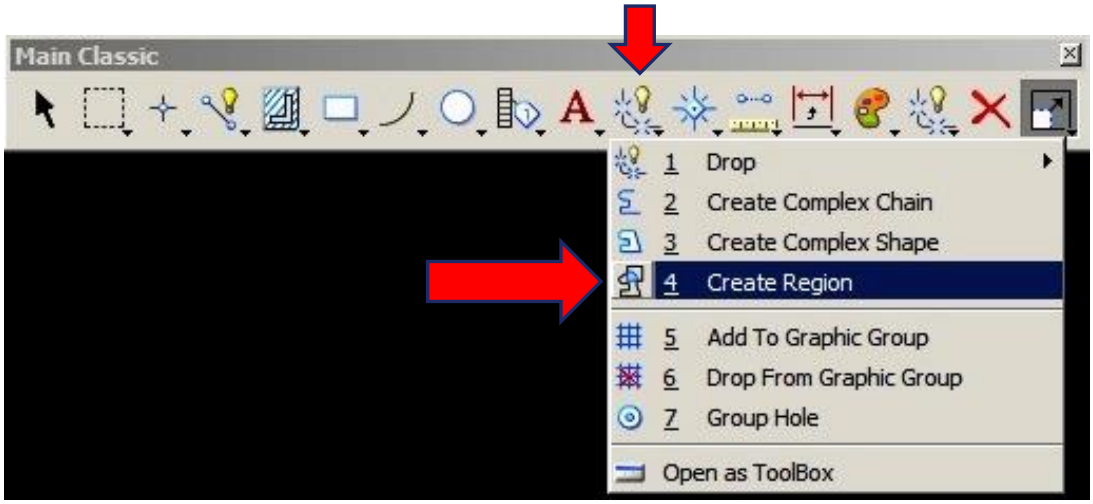
It is beneficial to place the boundary (.dgn) file in an empty directory within the project file structure so there is no confusion once the ASCII (.txt) and (.dat) files are created. If more than one boundary exists such as in an Obscured Area file an ASCII (.txt) and (.dat) will be created for each and can be combined later (if needed) to import one file rather than multiple. The output location of the ASCII (.txt) and (.dat) file(s) WILL BE placed in the same location as the boundary (.dgn) file. Also, each boundary within the (.dgn) file must be a closed polygon in order for the "Extract DEM" program to intersect the NCFMP and/or QL2 Lidar data sets.

# CREATING CLOSED POLYGONS

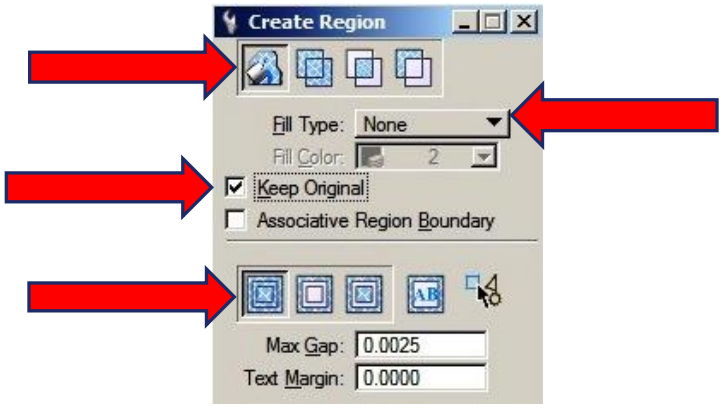
If the boundary is not a closed polygon it is necessary to create a closed polygon for each boundary within the (.dgn) file.

***NOTE:*** *If the boundary is already a closed polygon this step can be skipped and go directly to Using* ***ArcMap****.*

Open the boundary (.dgn) file in Microstation. Select the **"Groups"** icon and then select **"Create Region"**

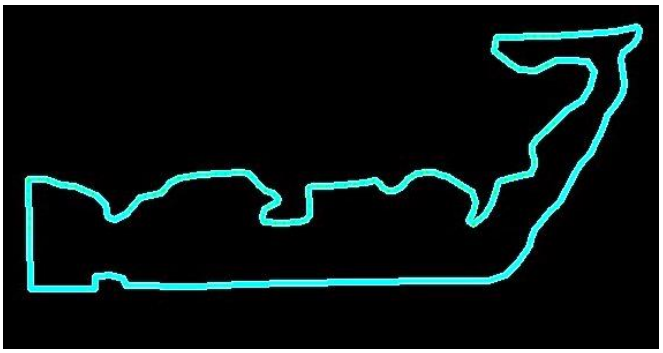


Once the *Create Region* dialog box opens select **"Flood"**. The Fill Type should be **"None"**, check on **"Keep Original"**, and select **"Ignore Interior Shapes"**.

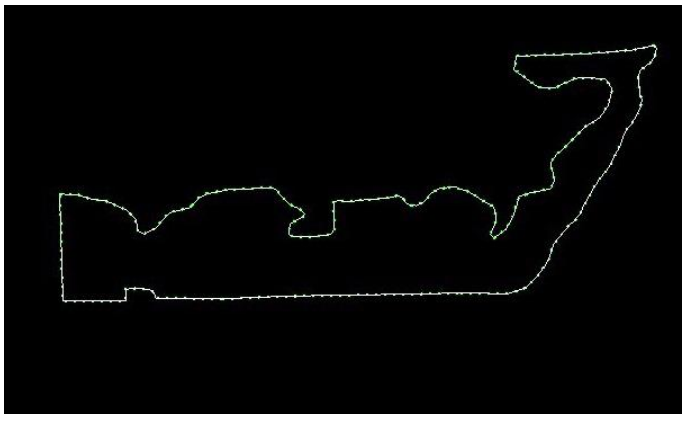



The active attributes should be different than the boundary attributes as this procedure will create the closed polygon on the active level.

"Data" inside each element. You will notice the element will highlight.



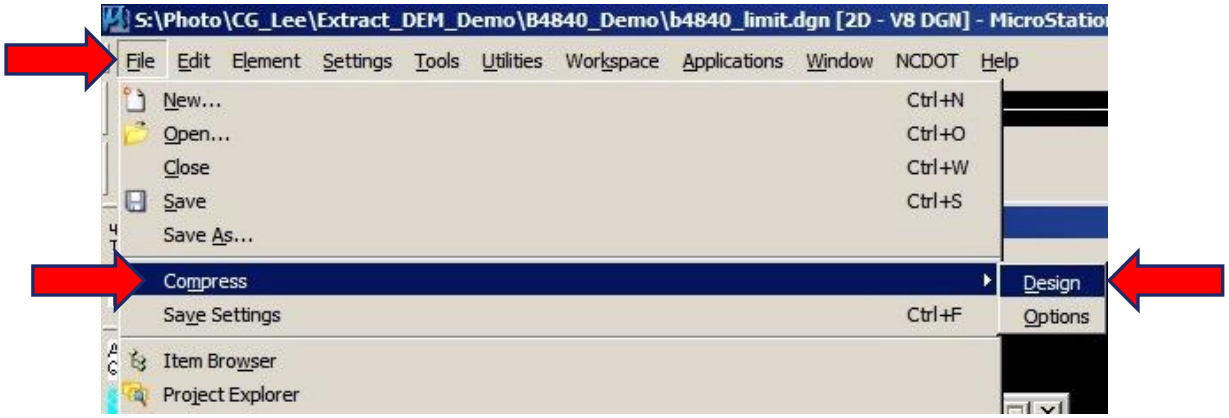
At this point, "data" again to accept. This will create a closed polygon for the boundary. This needs to be done for each element within the boundary (.dgn) file.



**IMPORTANT:** Be sure to compress the design file before exiting and deactivate GeoPak.

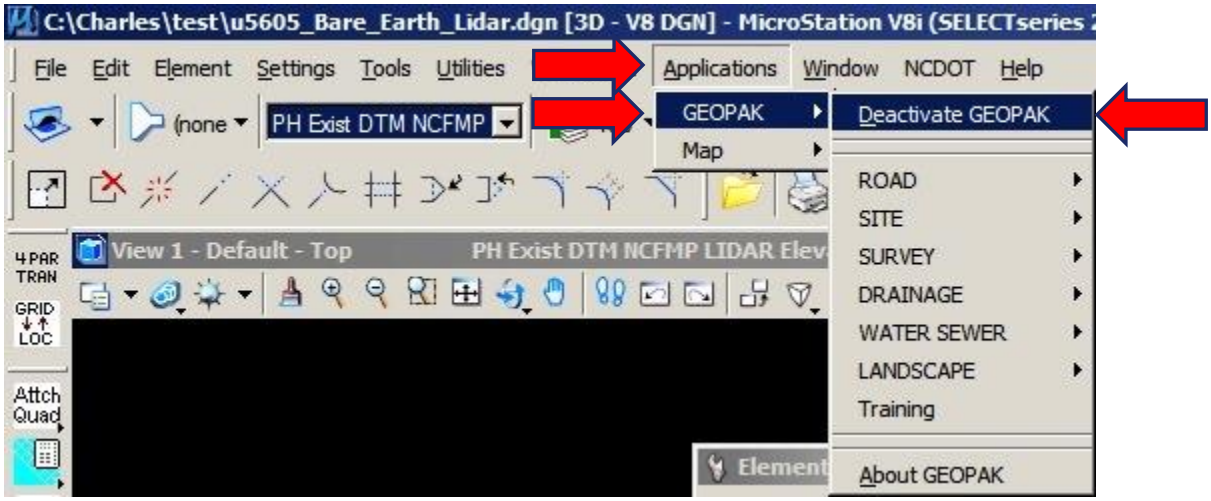
## COMPRESSING A DESIGN FILE

This can be done by selecting **"File"**, **"Compress"**, then **"Design"** in the upper left corner of the *Microstation Design File Window*.



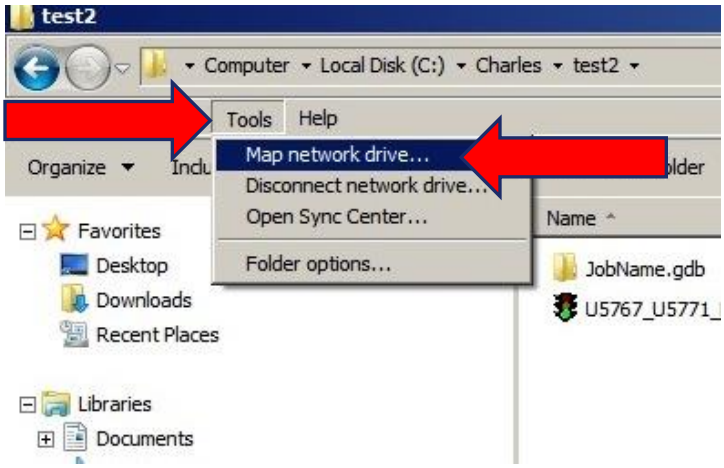

## DEACTIVATING GEOPAK

In the top left portion of the Microstation Design File Select **"Applications"**, **"GEOPAK"**, then **"Deactivate GEOPAK"**.

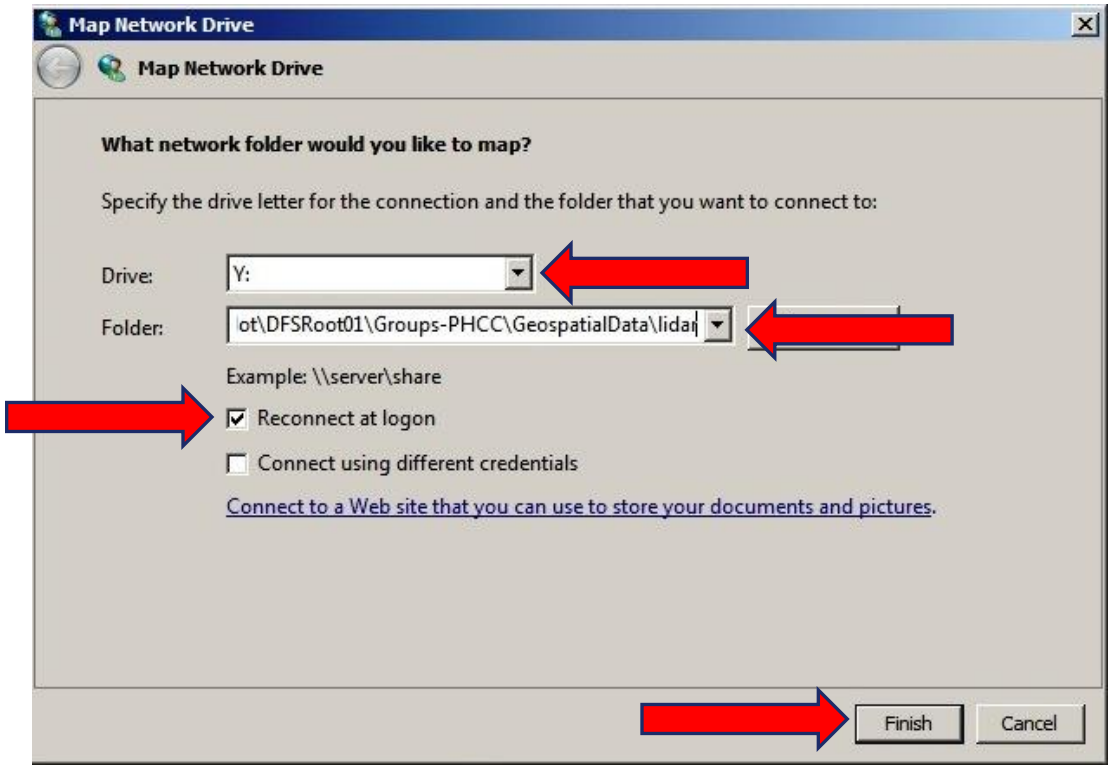


# MAPPING NETWORK DRIVE

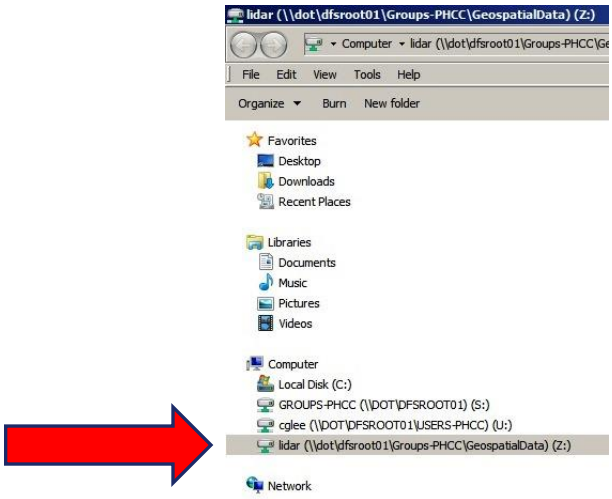
In order to connect to the location of the *"Extract DEM"* tool, the user may need to connect to a network drive. In a windows explorer window select **"Tools"** then **"Map network drive…"**




Using the drop down arrow next to *"Drive"* and choose the letter you wish to associate the mapped folder to. In the space next to *Folder:* type ***\\dot\DFSRoot01\Groups-PHCC\GeospatialData\lidar***. Check on **"Reconnect at login"** and select **"Finish"**



Once the network connection is made it will appear in the windows explorer window in order according to the letter chosen.



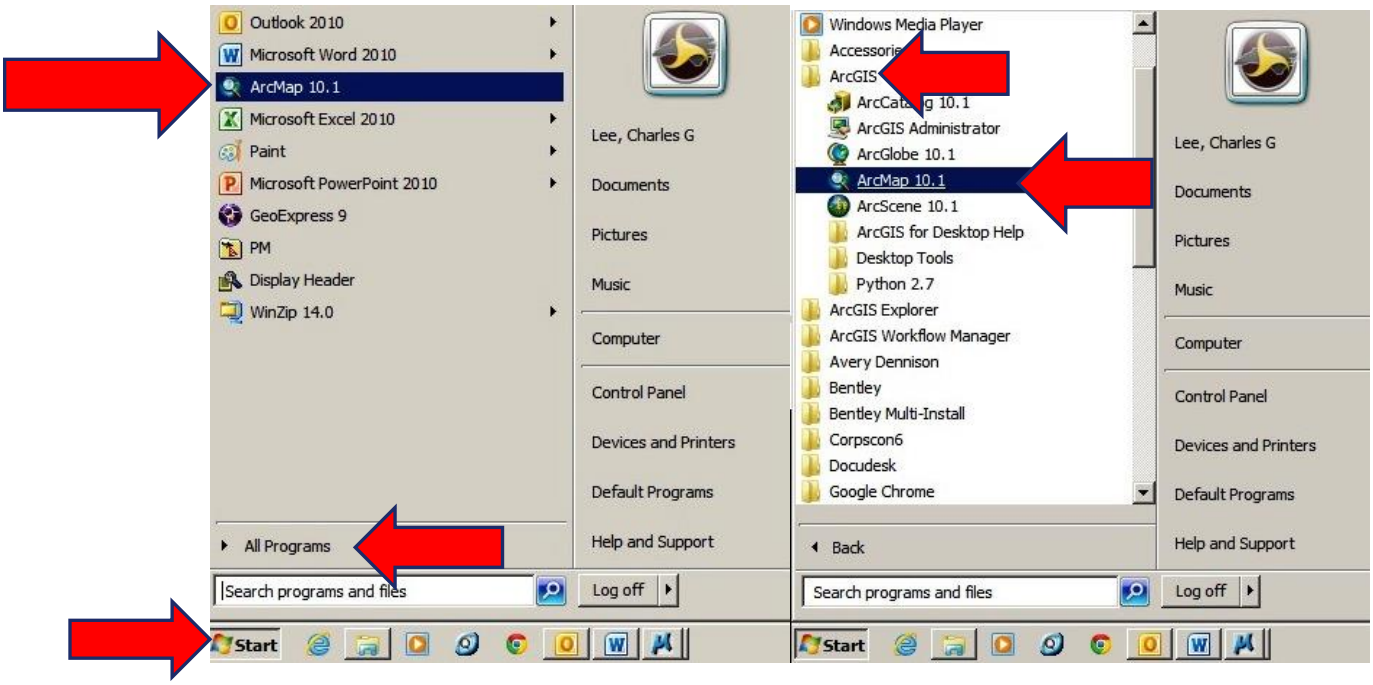

# USING ARCMAP

First the user should open an instance of ArcMap either on their personal workstation or a vacant "shared" workstation.

This can be done one of 2 ways.

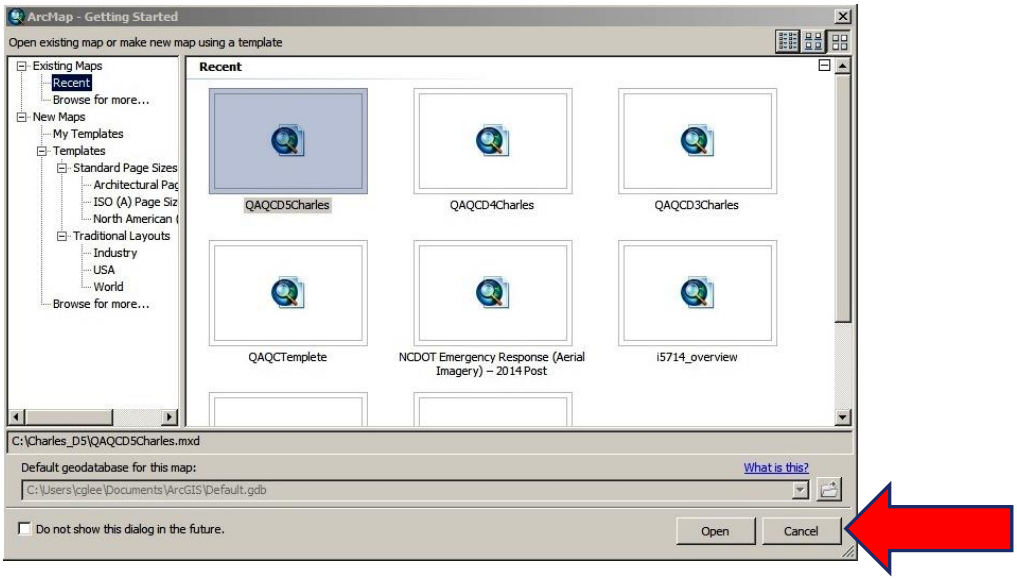
If the user has opened an instance of ArcMap recently it can be found by selecting the **"Start"** button in the lower left of the desktop then selecting **"ArcMap"**

If there's no option in the *recently opened* portion of the start window, once the user has selected the **"Start"** button, select **"All Programs"**, then navigate to and select **"ArcGIS"**. This will open more choices and the user should select **"ArcMap"**

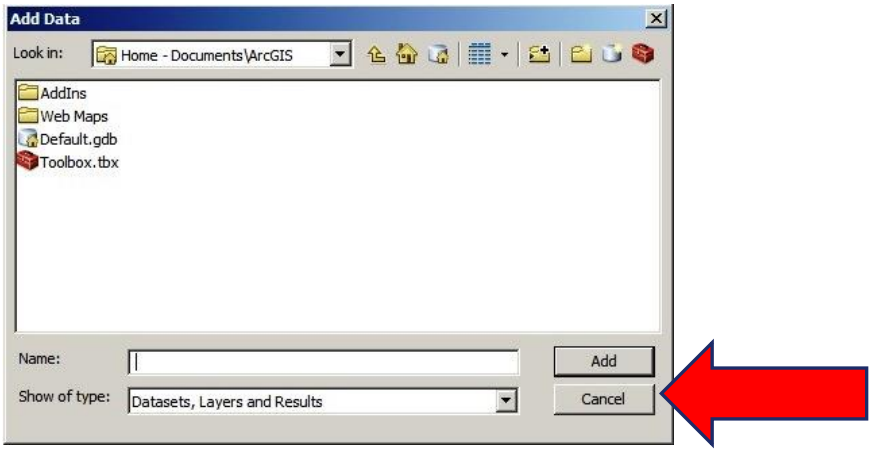



**<u>NOTE:</u> Once the "Get Decimated Lidar" program is set to run, it cannot be minimized to work in the background while other tasks are continued. However, other programs may be opened in front of the ArcMap window to continue with other tasks.**

Upon the opening of the ArcMap program, the following *ArcMap – Getting Started* window will appear. If so, select **"CANCEL"**



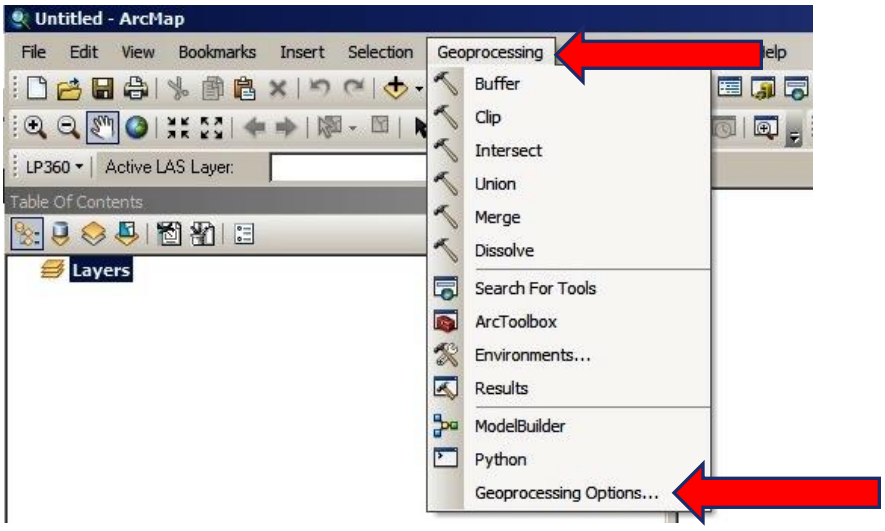
Upon canceling the *"ArcMap-Getting Started"* window, the following *"Add Data"* window may also open: If so, select **"Cancel"**



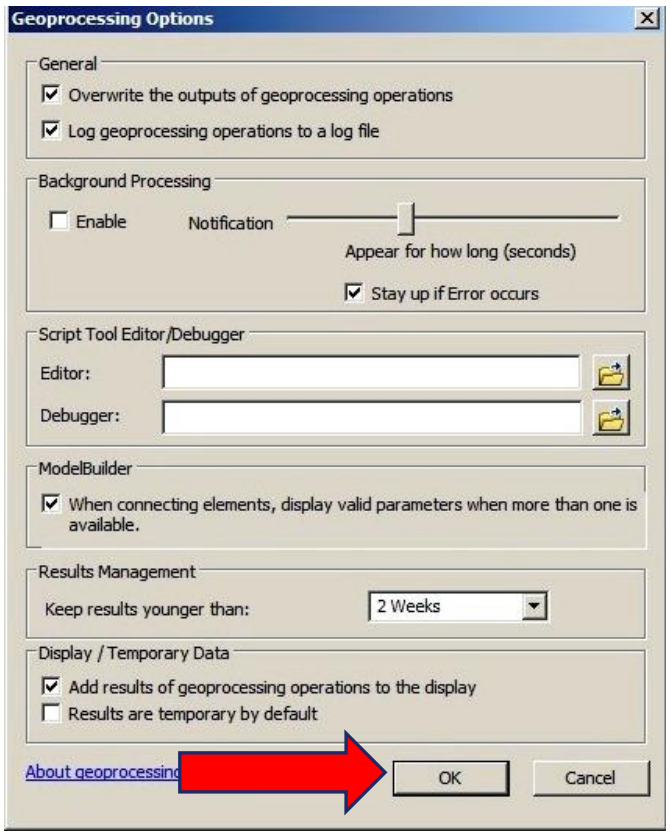

# FIRST TIME USER SETTINGS

Once the user has opened an instance of ArcMap there are some settings that need to be changed **ESPECIALLY** if it's the first time opening the instance on a particular workstation for the use of this program.

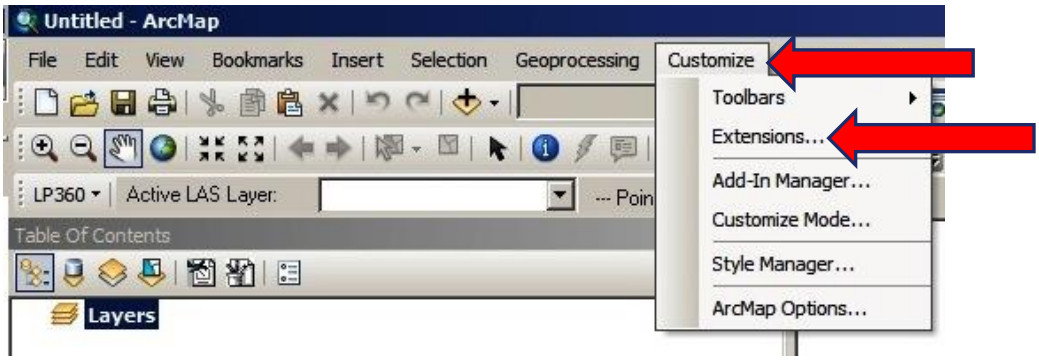
First, the user should select **"Geoprocessing"** located along the top of the ArcMap window, then select **"Geoprocessing Options"**



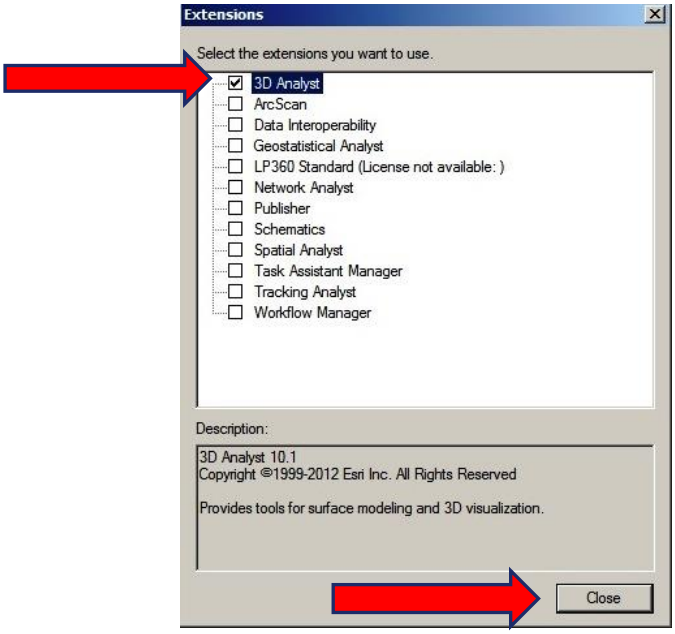
Once the user has completed making the same selections as in the following *Geoprocessing Options* illustration, select **"OK"**



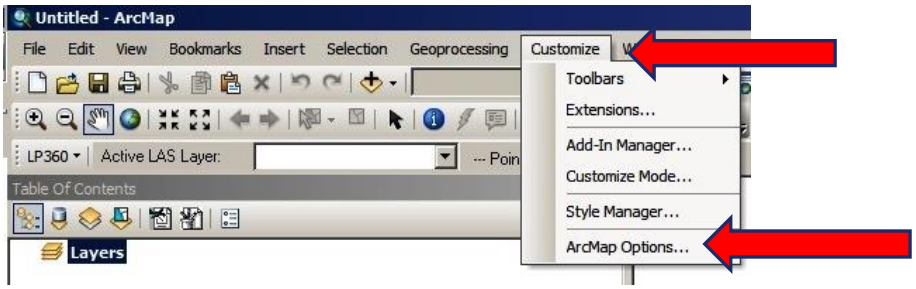

Next select the **"Customize"** option along the top of the *ArcMap window*, then select **"Extensions"**



Check on **"3D Analyst"**, then select **"Close"**

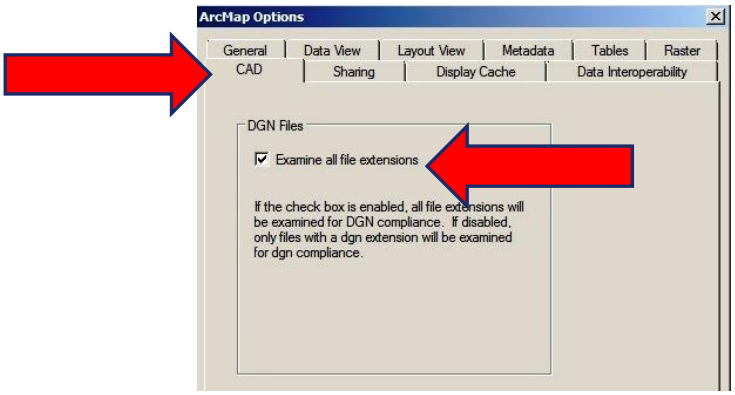



Once again select the **"Customize"** option along the top of the *ArcMap window*, then select **"ArcMap Options"**



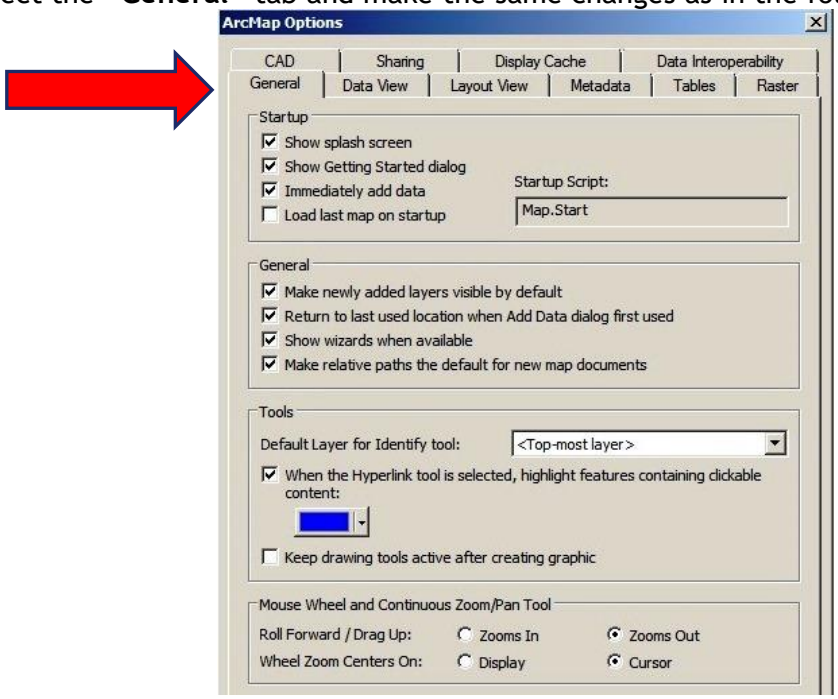

Once **"ArcMap Options"** has opened, there are several settings to be changed in the *ArcMap Options* window.

Select the **"CAD"** tab and check on **"Examine all file extensions"**

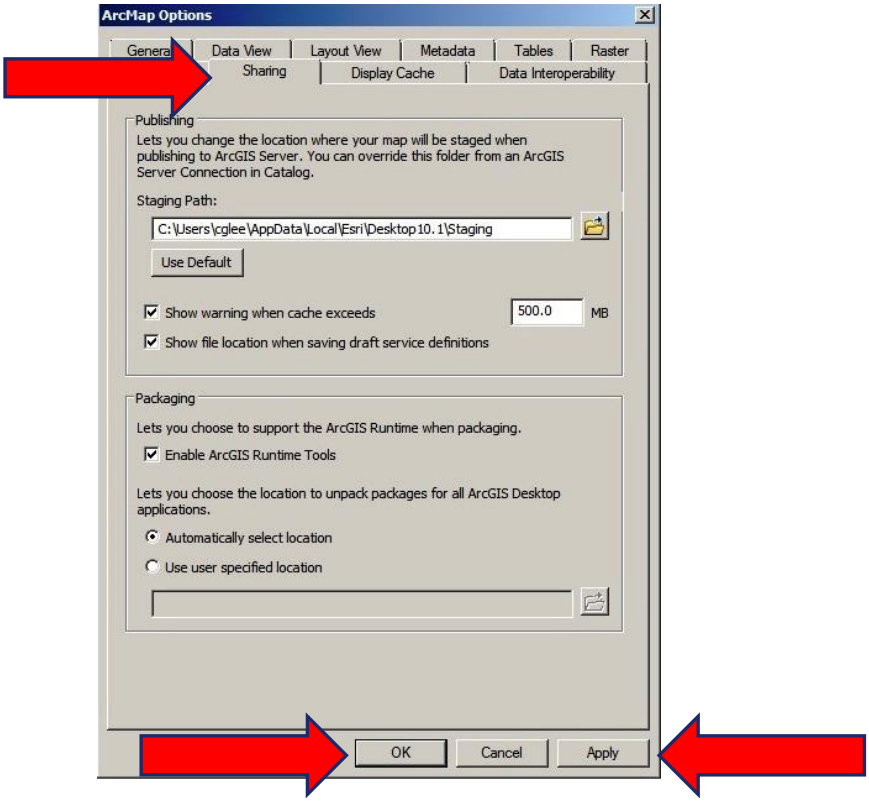


Select the **"General"** tab and make the same selections as in the following illustration. Then select **"Apply"** and **"OK"**

Select the **"General"** tab and make the same changes as in the following illustration.



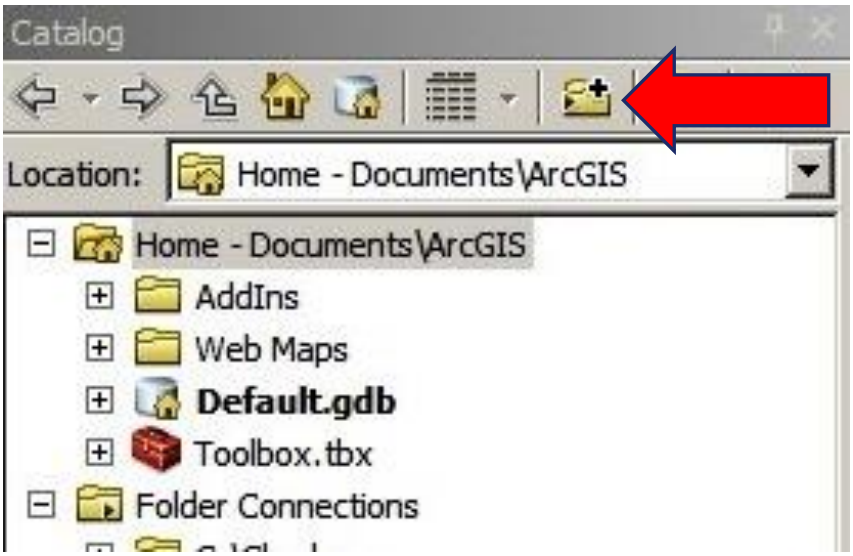

Select the **"Sharing"** tab and make the same selections as in the following illustration. Then select **"Apply"** and **"OK"**



# ADD CONNECTION VIA CATALOG

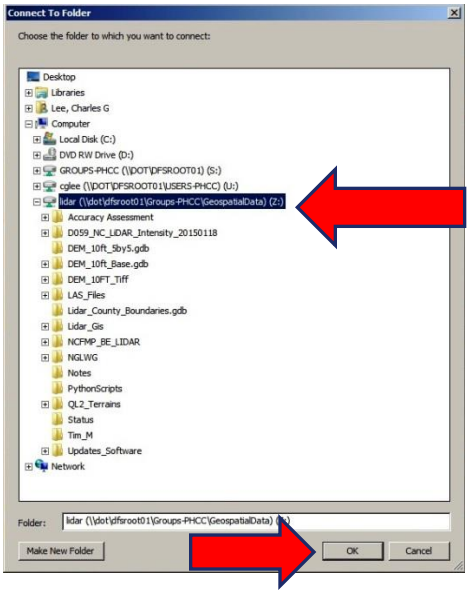
If the *Catalog window* is not open, select the **"Windows"** option along the top portion of the *ArcMap window* and select **"Catalog"**


Once the *Catalog window* has opened select the **"Add Connection"** option along the top of the window

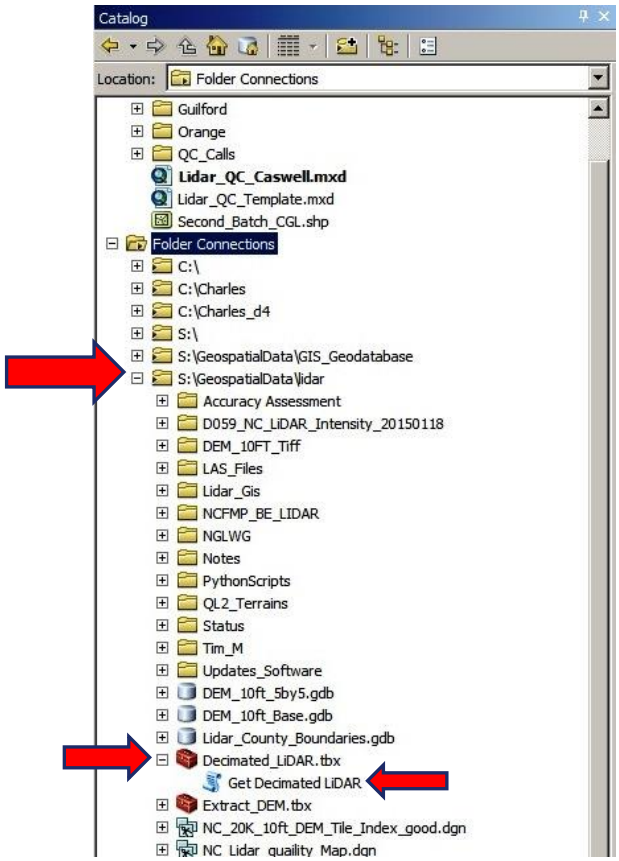



Once the *Connect To Folder* window has opened navigate to the newly mapped network drive, ie; *lidar (\\dot\dfsroot01) (Z:)*

Highlight by *selecting it* then select **"OK"**




After the connection has been made to *"lidar (\\dot\dfsroot01) (Z:)"* expand by selecting the **"+"** next to the directory in the *Catalog* window. Then also select the **"+"** next to *"Decimated_LIDAR.tbx"*. This allows the user access to the *"Get Decimated Lidar"* program, double click to initiate.



# RUNNING THE "GET DECIMATED LIDAR" PROGRAM

It is beneficial to place the boundary (.dgn) file in an empty directory so there is no confusion once the ASCII (.txt) files are created. If more than one boundary exists such as in an Obscured Area file an ASCII (.txt) will be created for each and can be combined later (if needed) to import one file rather than multiple. The output location of the ASCII (.txt) file(s) WILL BE placed in the same location as the boundary (.dgn) file. Also, each boundary within the (.dgn) file must be a closed polygon in order for the "Get Decimated Lidar" program to intersect the NCFMP and/or QL2 Lidar data sets.

**SOME THINGS TO KEEP IN MIND:**

- ✓ **REMINDER: Once the "Get Lidar" program is set to run, it cannot be shrunk to work in the background while other tasks are continued. However, other programs may be opened in front of the ArcMap window to continue with other tasks. If the user has a large area it may be beneficial to run the program on a vacant shared workstation or set to run in the evening.**

- ✓ **The boundary *filename* CAN NOT contain any special characters, ie: the "&" symbol or "spaces".**

- ✓ **The *directory structure* of the boundary file location CAN NOT contain any special characters, ie: the "&" symbol or "spaces".**

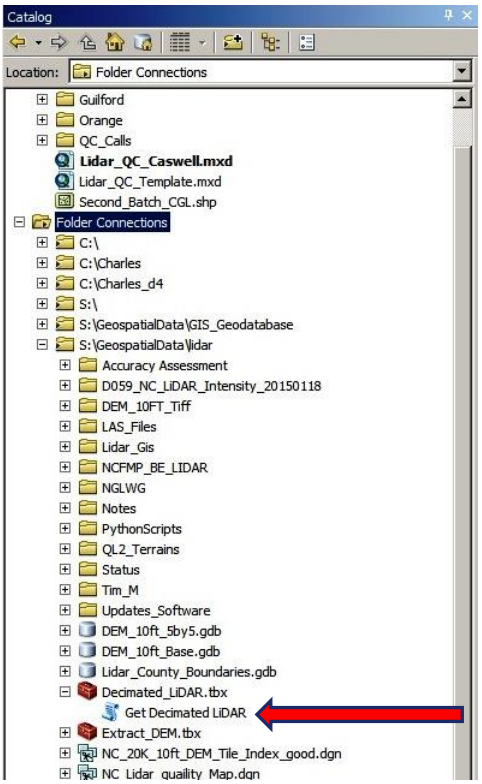
 ***ie; "S:\photo\Get Lidar"*** 

**IT HAS TO BE**

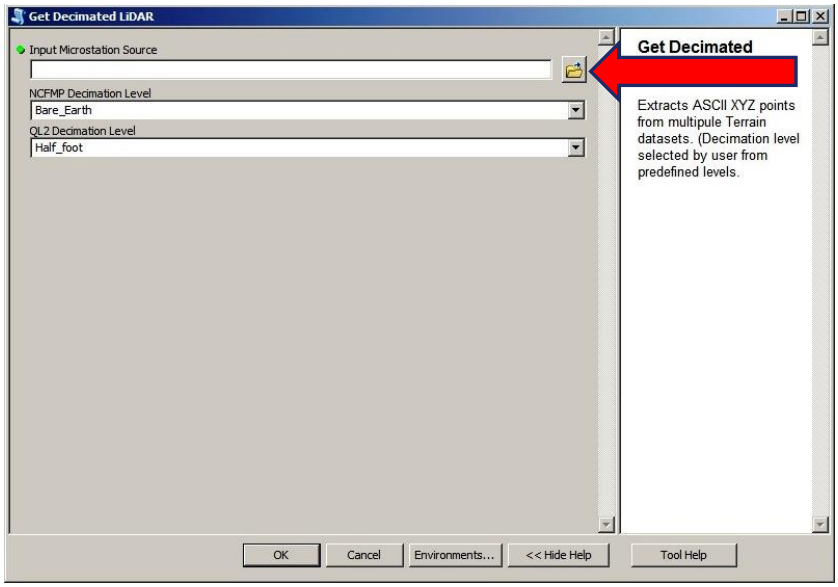
 ***"S:\photo\GetLidar" or "S:\photo\Get_Lidar"*** 

- ✓ **When the "Get Lidar" program initiates it will extract QL2 Lidar first in the boundary area(s). If QL2 Lidar does not exist for that area it will then extract NCFMP Lidar.**

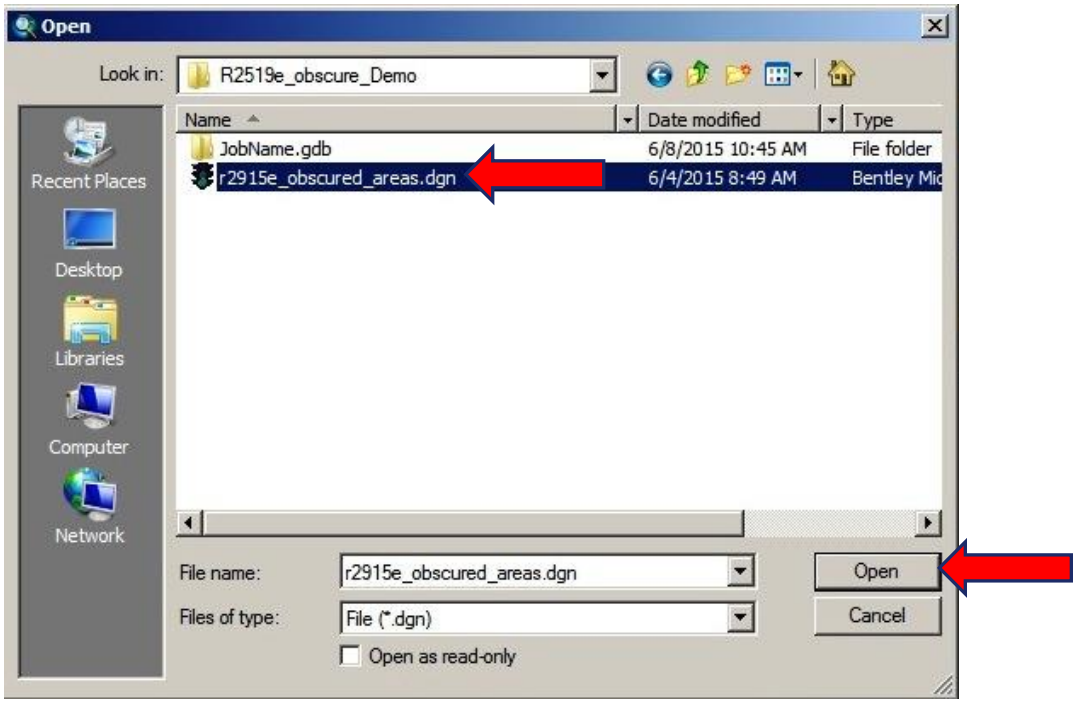
To initiate the *"Get Decimated Lidar"* program double click **"Get Decimated Lidar"** in the *Catalog* window.



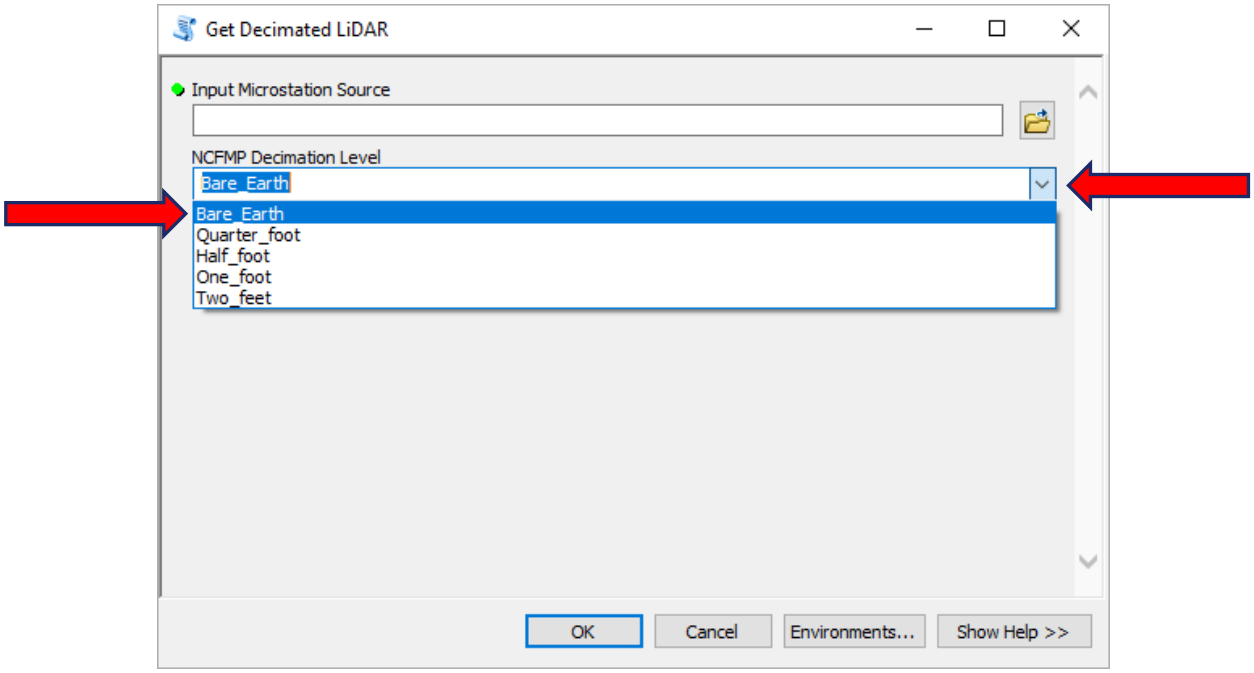

Once the *"Get Decimated Lidar"* window has opened, an *Input Microstation Source* must be selected, this is the boundary (.dgn) file. This is done by selecting the **"Browse"** button.



Navigate to the location of the boundary (.dgn) file and select it, then **"Open"**

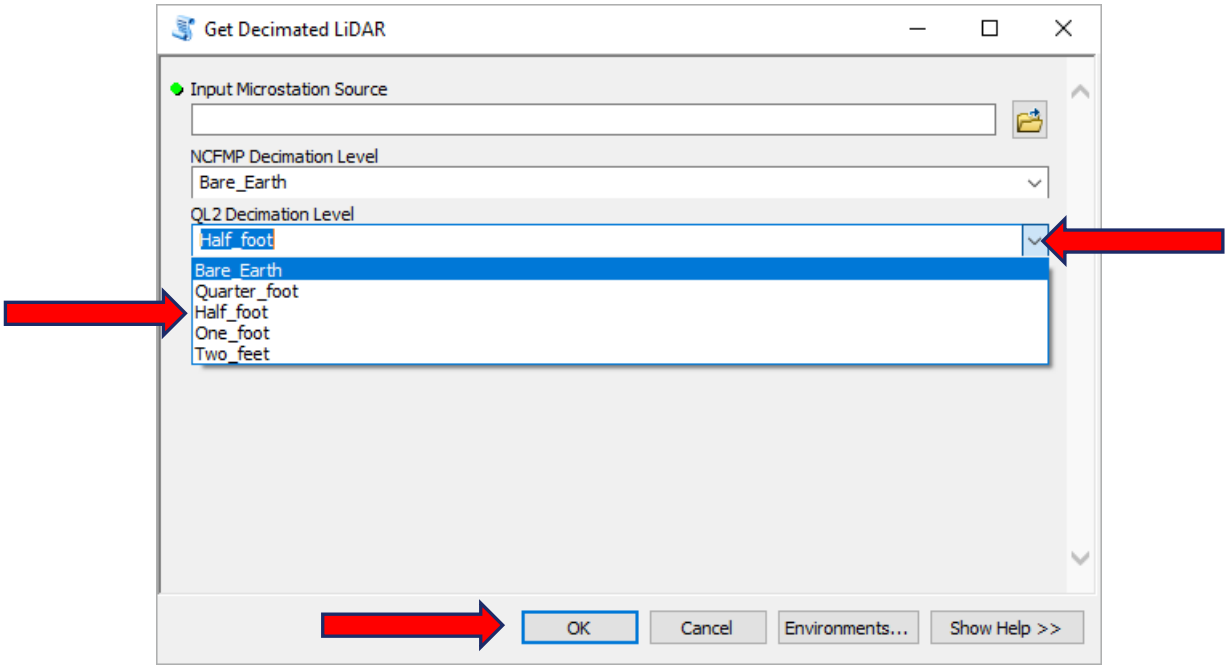



Next choose the *pull down* option for the *NCFMP Decimation Level*. This option should always be set to **Bare_Earth** if getting lidar for **Obscured Areas**.

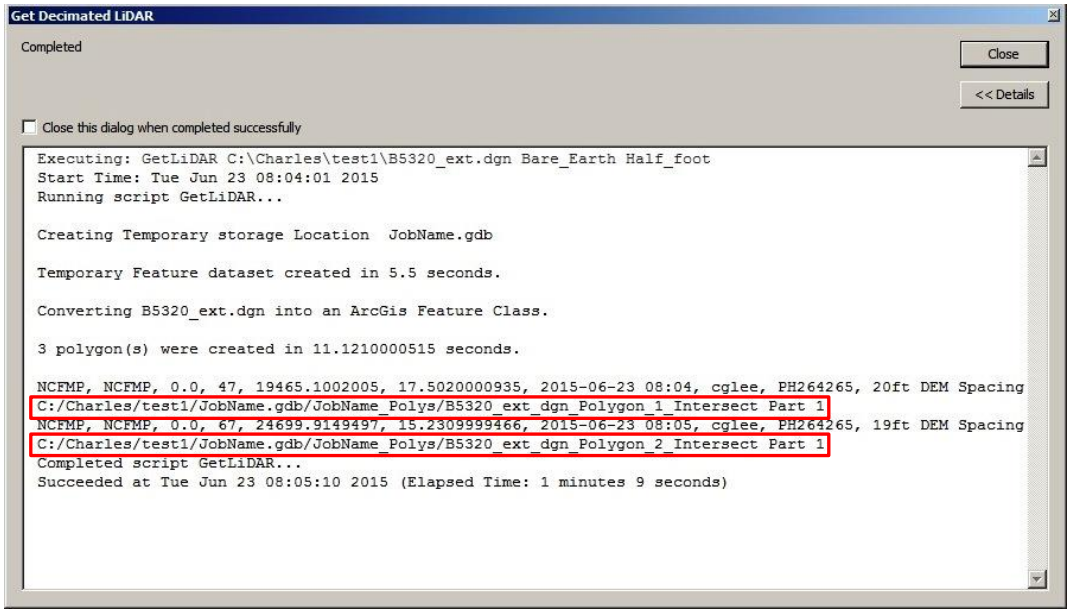


Next choose the *pull down* option for the *QL2 Decimation Level*. Typically this will be set to **Half_Foot** for Obscured Areas.

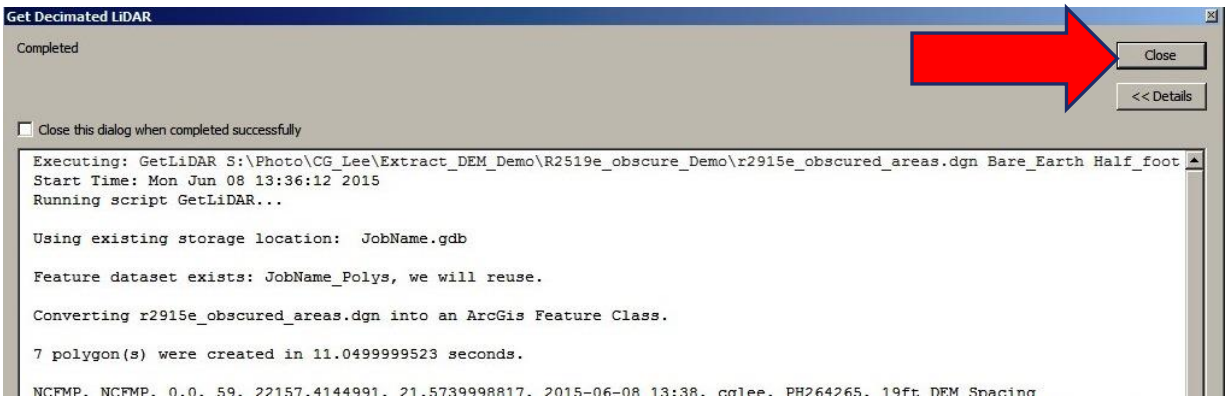
Then Select **"OK"** to initialize.



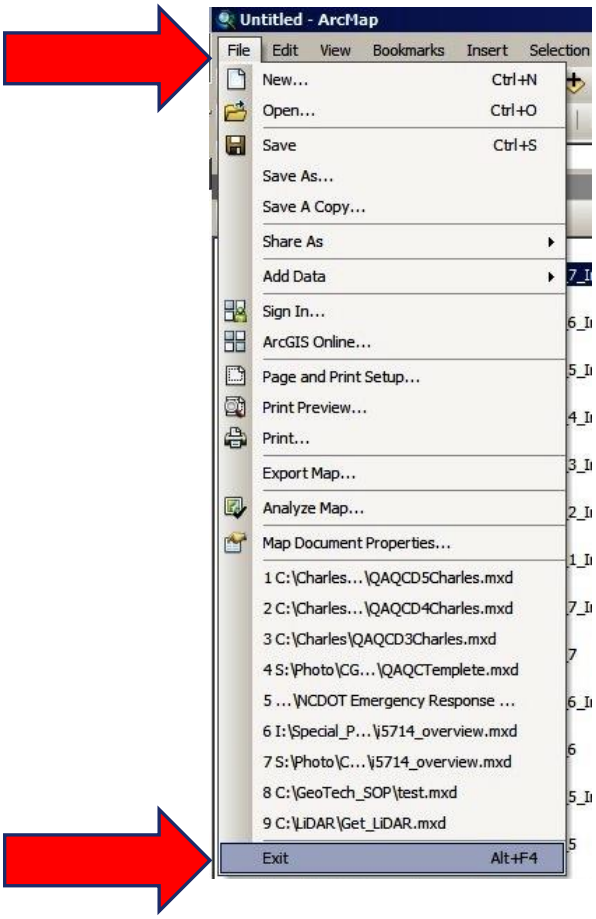

Once the "Get Decimated Lidar" program has completed, the user will notice a .txt file has been created for each polygon within the boundary (.dgn) and labeled Polygon_1, Polygon_2, Polygon_3, etc. and can be combined (see; **Combining Multiple ASCII Files**).



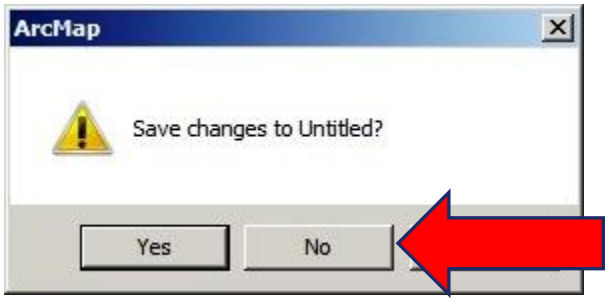
To exit the *"Get Decimated Lidar"* program, simply select **"Close"** on the Get Decimated Lidar window




To exit *ArcMap*, select **"File"** along the top of the *ArcMap window* and **"Exit"**



When asked to save changes select **"No"**

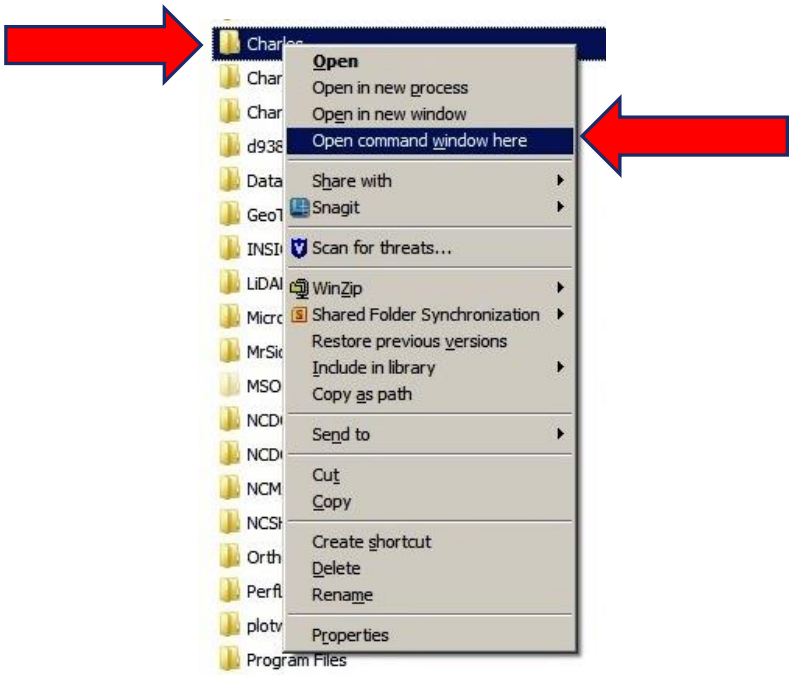



## COMBINING MULTIPLE ASCII FILES

If multiple ASCII files were created because of multiple boundaries within the boundary file, they can be imported into one file so as to reduce the amount of time of importing one file vs multiple files in Mircostation.

**NOTE: If one ASCII file was created, these steps can be skipped and go directly to Importing ASCII (.txt) Files into Microstation.**

In Windows Explorer hold the shift key down while right clicking on the directory that contains the ASCII (.txt) files and select **"Open command window here"**




An *"MS DOSS"* command window will appear.

**NOTE:** To obtain a command window when using **Windows 10**, navigate to the directory the .txt files reside, select the address bar at the top of the windows explorer so that the entire address is highlighted and type **"cmd"** then enter. Once the command window appears follow the directions as follows.

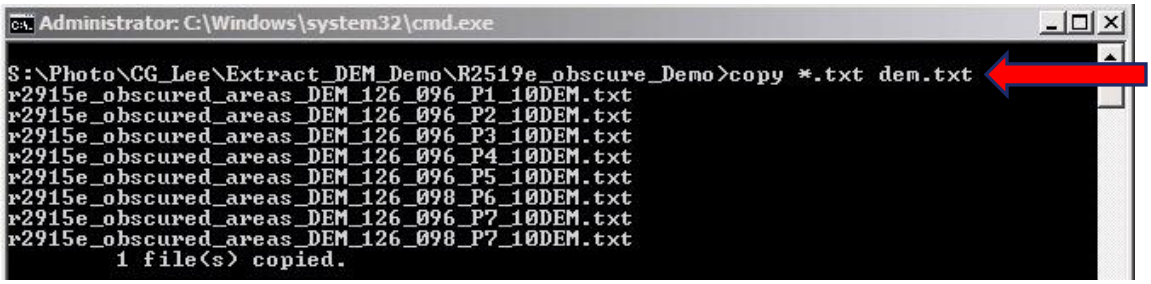
At the prompt type the following;

**.txt**

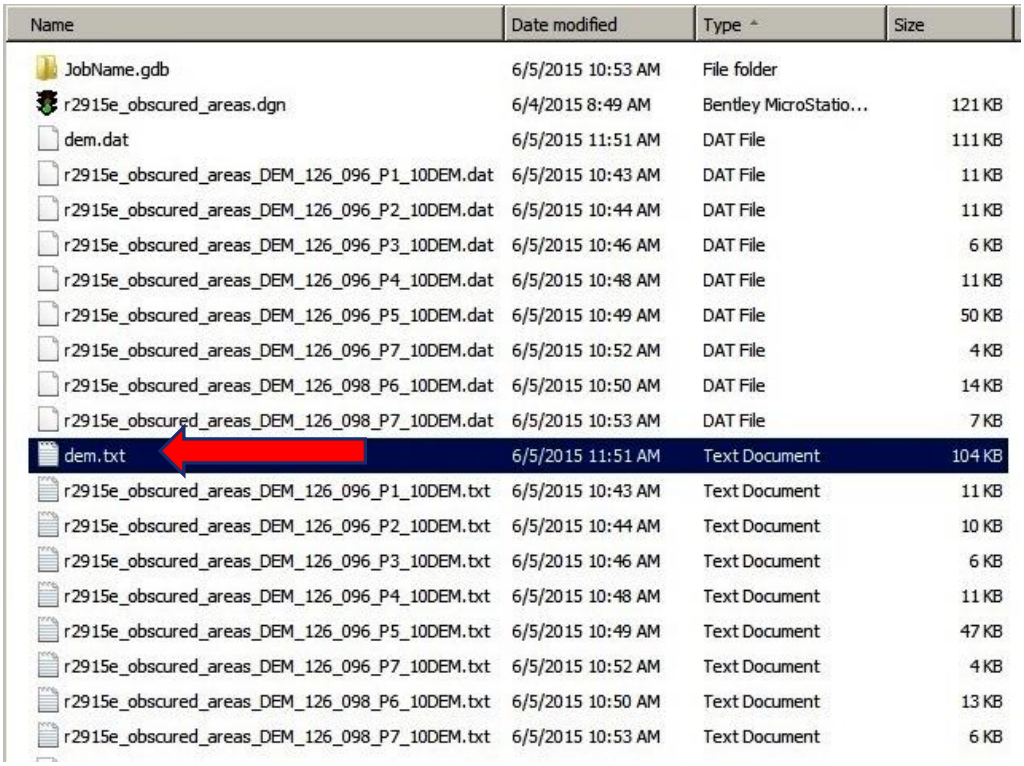
*Copy [space] *.txt [space] "name of file".txt*

*Ie: copy *.txt nameoffile.txt*

Press **"Enter"**




The "filename" *(ie: dem.txt)* will be saved in that directory.



| Name | Date modified | Type | Size |
|---|---|---|---|
| JobName.gdb | 6/5/2015 10:53 AM | File folder | |
| r2915e_obscured_areas.dgn | 6/4/2015 8:49 AM | Bentley MicroStatio... | 121 KB |
| dem.dat | 6/5/2015 11:51 AM | DAT File | 111 KB |
| r2915e_obscured_areas_DEM_126_096_P1_10DEM.dat | 6/5/2015 10:43 AM | DAT File | 11 KB |
| r2915e_obscured_areas_DEM_126_096_P2_10DEM.dat | 6/5/2015 10:44 AM | DAT File | 11 KB |
| r2915e_obscured_areas_DEM_126_096_P3_10DEM.dat | 6/5/2015 10:46 AM | DAT File | 6 KB |
| r2915e_obscured_areas_DEM_126_096_P4_10DEM.dat | 6/5/2015 10:48 AM | DAT File | 11 KB |
| r2915e_obscured_areas_DEM_126_096_P5_10DEM.dat | 6/5/2015 10:49 AM | DAT File | 50 KB |
| r2915e_obscured_areas_DEM_126_096_P7_10DEM.dat | 6/5/2015 10:52 AM | DAT File | 4 KB |
| r2915e_obscured_areas_DEM_126_098_P6_10DEM.dat | 6/5/2015 10:50 AM | DAT File | 14 KB |
| r2915e_obscured_areas_DEM_126_098_P7_10DEM.dat | 6/5/2015 10:53 AM | DAT File | 7 KB |
| dem.txt | 6/5/2015 11:51 AM | Text Document | 104 KB |
| r2915e_obscured_areas_DEM_126_096_P1_10DEM.txt | 6/5/2015 10:43 AM | Text Document | 11 KB |
| r2915e_obscured_areas_DEM_126_096_P2_10DEM.txt | 6/5/2015 10:44 AM | Text Document | 10 KB |
| r2915e_obscured_areas_DEM_126_096_P3_10DEM.txt | 6/5/2015 10:46 AM | Text Document | 6 KB |
| r2915e_obscured_areas_DEM_126_096_P4_10DEM.txt | 6/5/2015 10:48 AM | Text Document | 11 KB |
| r2915e_obscured_areas_DEM_126_096_P5_10DEM.txt | 6/5/2015 10:49 AM | Text Document | 47 KB |
| r2915e_obscured_areas_DEM_126_096_P7_10DEM.txt | 6/5/2015 10:52 AM | Text Document | 4 KB |
| r2915e_obscured_areas_DEM_126_098_P6_10DEM.txt | 6/5/2015 10:50 AM | Text Document | 13 KB |
| r2915e_obscured_areas_DEM_126_098_P7_10DEM.txt | 6/5/2015 10:53 AM | Text Document | 6 KB |

**NOTE: Before Importing Coordinates be sure to set the Active Level attributes to the corresponding type of Lidar being imported.**

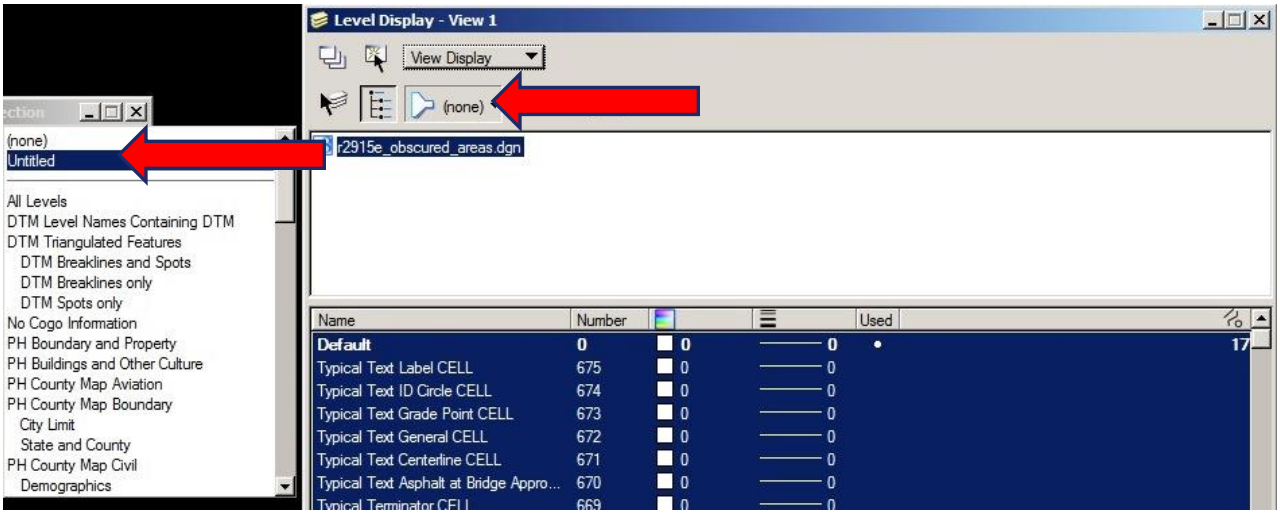
**NCFMP** - PH Exist DTM NCFMP LIDAR Elevation Point (Level #16016)

**QL2** - PH Exist DTM QL2 Lidar Elevation Point (Level #16306)

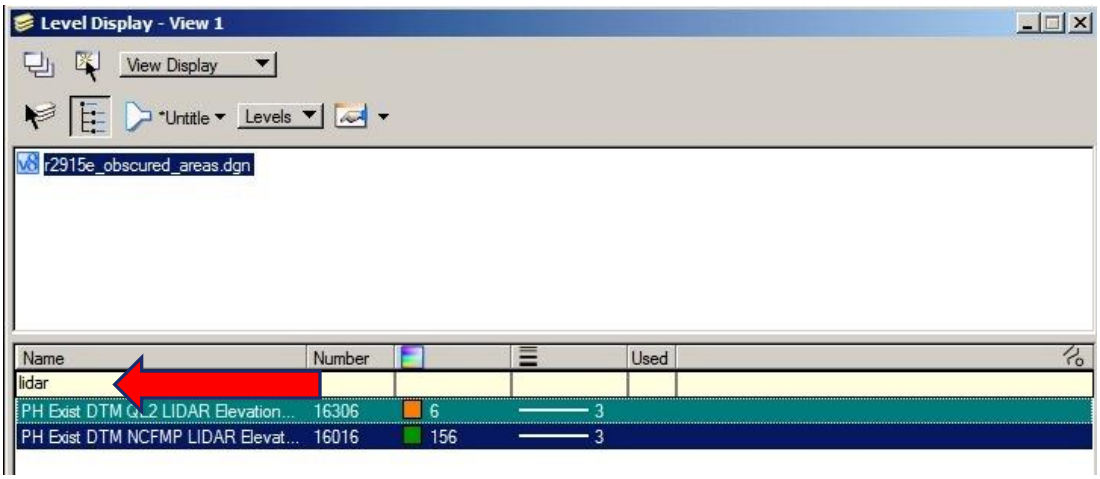
## SETTING ACTIVE LEVEL ATTRIBUTES

Select the **"Level Display"** icon

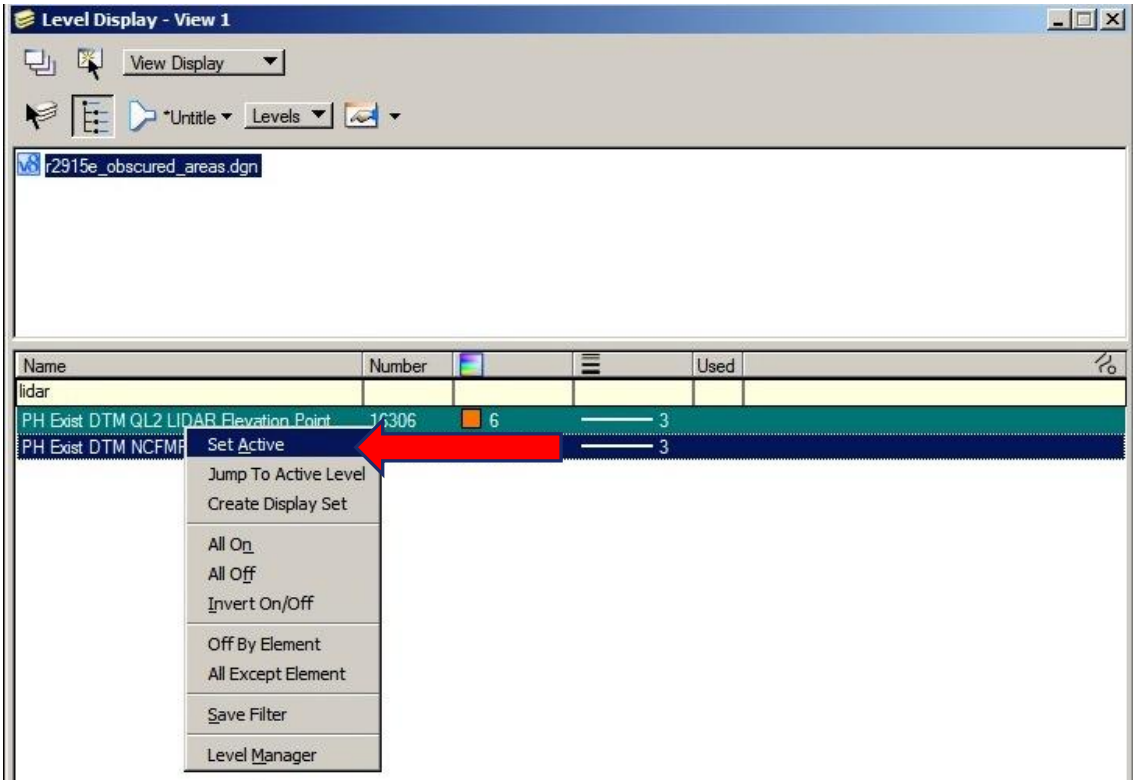
In the *Level Display* window, select the **"List Filter"** icon and set to **"Untitled"**



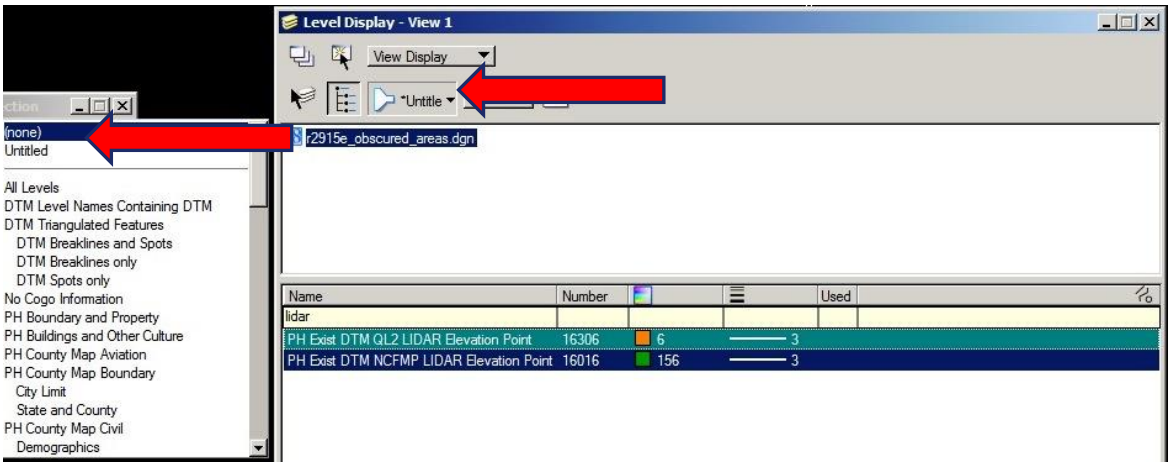

Select the Blank Area at the top of the *Level Name* window and type **"lidar"**, then press the **"Enter"** button on your keyboard. This will display only the levels that correspond to Lidar.




"*Right Click*" with your mouse on the appropriate Lidar Level and select **"Set Active"**



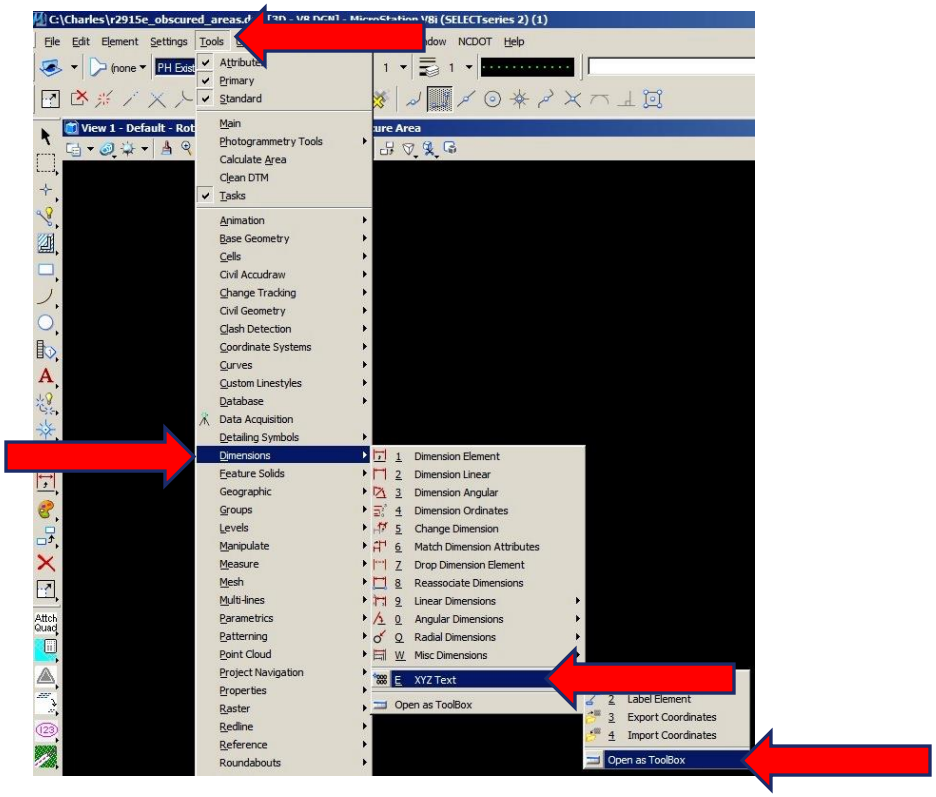
To return your Level Display window to show all levels, select the **"List Filter"** then **"None"**



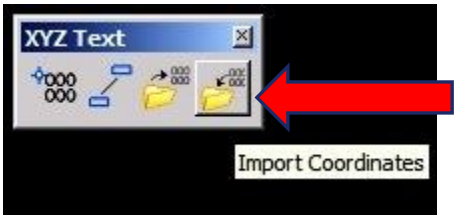

# IMPORTING ASCII (.TXT) FILES INTO MICROSTATION

Once the ASCII file(s) has been created it can be imported using the *Import Coordinates* tool in the *XYZ Text* toolbox.

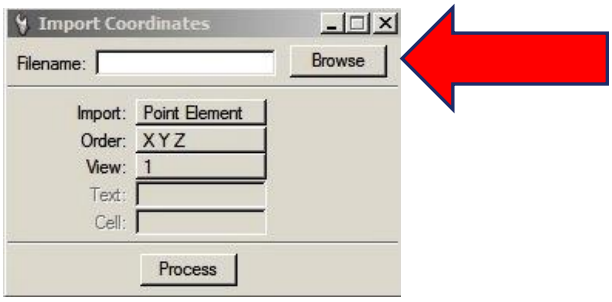
Open the boundary file in *Microstation*. Select the **"Tools"** option along the top of the *Microstation* window, select **"Dimensions"**, select **"XYZ Text"**, then **"Open as Toolbox"**.



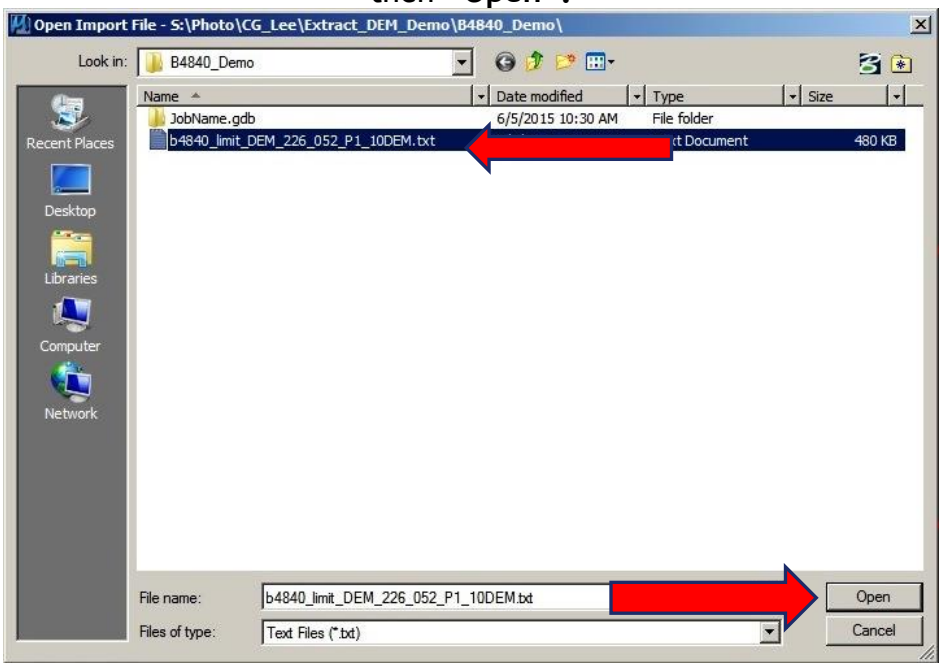
Select **“Import Coordinates”**



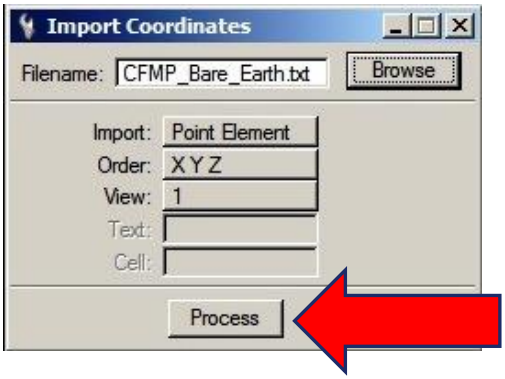

In the *Import Coordinates* dialog box, select **“Browse”**




In the *Open Import File* dialog box, browse to the location of the .txt file.
Select the ASCII file
ie: b4840_limit_DEM_226_052_P1.txt or the combined file *dem.txt*,
then **“Open”.**



Select **“Process”**




The ASCII file will be imported into your design file with the attributes of the active level.

Repeat the steps above for each ASCII file created making sure the correct active level is set for the type of Lidar being imported.

**NOTE:** Extracted Lidar from both NCFMP and QL2 is in a gridded coordinate system and, if needed, would have to be converted to a localized coordinate system.