

Working with Target for ArcGIS Drillhole Tools

This *Working with Target for ArcGIS Drillhole Tools* How-to Guide walks you through setting up a new Target for ArcGIS drillhole project, importing data into the project and providing detailed quality control and quality assurance tests on your imported data.

Starting a New Target for ArcGIS Drillhole Project

When you start a new drillhole project the "Collar" database is created and displayed. With the Target for ArcGIS system, individual 'data type' databases are created to enable easier data management. These databases are linked by a common project name, which appears at the start of the individual database names. For example, separate databases for collar, survey, assay, and geology are created and linked by project name.

In a project named "Prospect" the following databases could be created:

- Prospect_Collar.gdb (collar information)
- Prospect_Survey.gdb (hole dip-azimuth survey information)
- Prospect_Geology.gdb (geology information – The "Geology" label is user specified)
- Prospect_Assays.gdb (assay information - the "Assay" label is user-specified)

 *When the Target for ArcGIS system is used, it scans the open project for all the project databases currently loaded to see which data is available. If you close one of the project databases, it will not be visible to the system and will not be used when processing your data. While working with a Target for ArcGIS project, if you wish to "hide" one of the databases, minimize it instead of closing it in order that Target for ArcGIS can continue to access it.*

Coordinate systems can be specified/modified by selecting the **Coordinate System** menu item on the Geosoft *Data* menu from the *Geosoft Database* toolbar.

Naming a Drillhole Project

The drillhole project name will be added, as a prefix, to all of your project databases (collar, survey, assay, geology, and other types of related information).

To Name a Drillhole Project

1. Make sure your Target for ArcGIS project is still open.
2. On the *Target Drillhole* toolbar, select Target Project and then select **New project**.
The *Drill Hole – New Project* dialog is displayed.
3. Specify a *New project name*.
4. Specify the *Maximum holes* and *Maximum data fields per dataset*. The defaults are 250 and 100 respectively.
5. Click the **OK** button. The collar database with the project name that you specified is displayed.

Importing Data Files

During drilling, the geologist acquires and integrates data from different sources and formats. The Target for ArcGIS system automatically detects the type of data that is being imported, including:

- Drillhole (collar) locations
- Surveys
- From to Data
- Point Data

There are two ways to define drillholes and add data to your project in Target for ArcGIS:

- Import data already stored in CSV/text or XLS/database data format. A common example is a geochemical assay file, which is commonly delivered to you on disk or via email by an assay laboratory in Excel XLS format. Depending on project needs, you may also initially have geological rock codes, collar data or survey data in text or data files.
- Manually enter data. If you are performing a grassroots exploration project, you may only have one or two holes to work with initially. In this case, you may just want to add some basic collar location or projected survey information to your project.

Current X and Y Channels (Columns)

Target for ArcGIS supports "current" X and Y (and Z) channels. This capability enables users to select the channels that they would like to use as the current X and Y (and Z) channels (for example, East, North, and Relative Level).

To set the current X and Y (and Z) channels, using the *Coordinates|Change X, Y coordinates* menu item; select the names of the new coordinate channels. This makes these channels the new current X and Y channels. You can also use this menu item to review the current settings for the X and Y channels.

Markers have been added to the channel header to indicate which channels are currently defined to be the "current" X, Y (and Z) channels. The markers are little rectangles on the right side of the header cell, and contain "x", "y" (or "z") in reversed display (like the triangle protection symbol on the left).

When you alter the current coordinate channels (*Coordinates|Change X, Y coordinates*), these markers change too. Normally, users will just get "x" and "y", but if you have a "Z" channel it will get the "z". The "z" will be used in Target for ArcGIS databases, where DH_EAST = "x", DH_NORTH = "y" and DH_RL = "z".

Collar Data

Collar information containing (at a minimum) Hole ID, Easting, Northing and Relative Level (Elevation). Note, that in the data example below, the Azimuth, Dip, and Depth are also included in the collar file.

Hole_ID	East	North	RL	Azimuth	Dip	Final_Depth
DD001	12102.04	9988.76	60.81	357.83	-60.16	139
DD002	11697.3	9983.07	60.58	357.25	-59.77	145
DD003	12100	9904	60	0	-60	100
DD004	12000	10027	60	0	-55	177.5
RC001	11401.51	10072.08	61.37	354.9	-59.98	124
RC002	11498.45	10040.51	60.77	355.42	-60.14	166
RC003	11597.55	10048.23	60.46	355.46	-59.86	154
RC004	11696.53	10060.64	60.17	356.73	-60.34	112
RC005	11697.13	9992.43	60.53	356.59	-58.96	136

Survey Data

(Optional) Hole deviation information in Hole ID, Depth, Azimuth, Dip format or Hole ID, Depth, Easting, Northing, Elevation format. Note that, a survey file is only required if a hole has actually been surveyed and the dip and azimuth change at depth.

Hole_ID	Depth	Dip	Azimuth			
DD001	0	-60.2	357.8			
DD001	10	-60.2	358.6			
DD001	20	-59.9	358.6			
DD001	30	-59.6	359.5			
DD001	40	-59.1	0.4			
DD001	50	-59.2	0.3			
DD001	60	-59.4	0.9			
DD001	70	-59	2.2			
DD001	80	-59.2	2.5			

From - To Data

From-To data is data acquired over specified depth intervals down the hole; for example, at a 1 m interval with a measurement starting at 0 m and extending to 139 m.

Hole_ID	From_Dep	To_Depth	Sample	Au	Ag	As	Standard	Duplicate
				ppm	ppm	ppm		
DD001	0	1	15773561	0.05	0	13		
DD001	1	2	15773562	0.04	0	11		
DD001	2	3	15773563	0.03	0	19		1
DD001	2	3	15773564	0.04	0	19		2
DD001	3	4	15773565	0.03	0	33		
DD001	4	5	15773566	0.02	0	36		
DD001	5	6	15773567	0.02	0	46		
DD001	6	7	15773568	0.03	0	45		

Point Data

Point data is data acquired in discrete measurements made at a specific depth, for instance 85.6 m.

Hole_ID	Depth	Dip	Azimuth	Mag		
DD001	0	-60.2	357.8	48838.7		
DD001	2.5	-60.2	358.6	48843.8		
DD001	3	-59.9	358.6	48849.9		
DD001	4.5	-59.6	359.5	48856.5		
DD001	5	-59.1	0.4	48863.1		
DD001	6.5	-59.2	0.3	48870.1		
DD001	7	-59.4	0.9	48876.1		
DD001	7.5	-59	2.2	48881.1		
DD001	9	-59.2	2.5	48885.3		

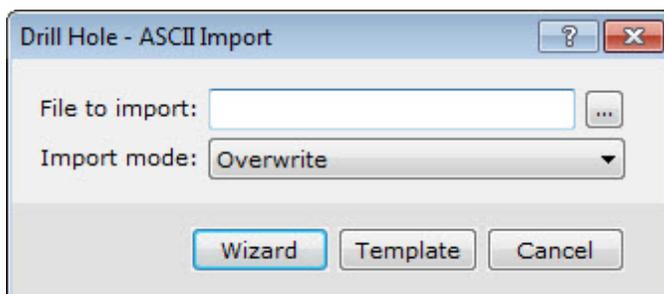
Importing Collar Data (CSV/text format)

When entering data in Target for ArcGIS, you must start with collar data. The system creates a unique collar database that you can use to view all drillholes in the project at a glance. You can also plot an initial plan map showing all holes for review purposes. A collar file must exist before survey or assay data can be imported, and before plans and sections can be created.

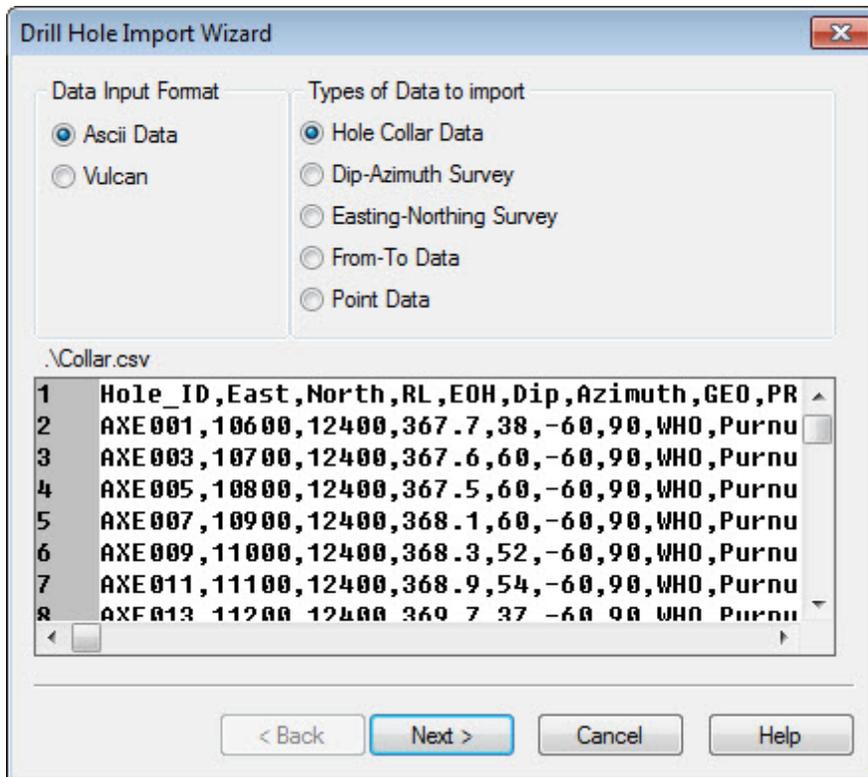
 *The Target for ArcGIS Drill Hole Import Wizard enables you to easily import data from any ASCII spreadsheet or text file. The Import Wizard supports both Delimited and Fixed Field ASCII files. The Import Wizard also imports Microsoft Excel Comma Separated Value (CSV), Comma Delimited, White Space Delimited and Tab Delimited data files. For more information about the Drill Hole Import Wizard settings, read the ASCII Import Wizard help topic or click the **Help** button on the dialog box.*

To Import Collar Data

1. On the *Data* menu, select **Import**.
2. Select **Text file**. The *Drill Hole – Ascii Import Wizard* dialog is displayed.

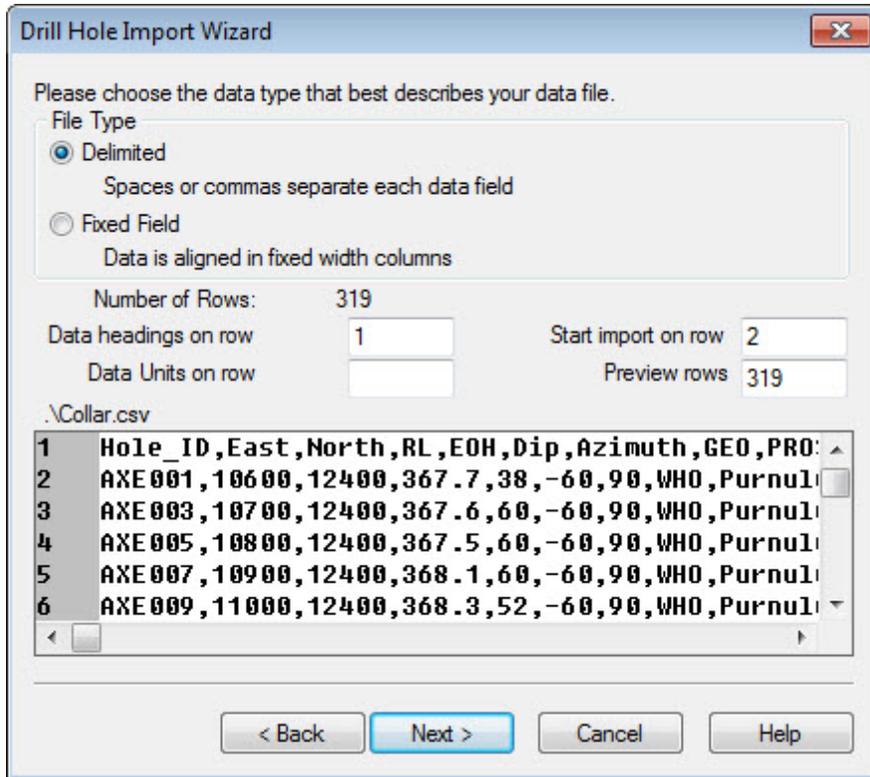


3. Use the *Browse* button to select the collar file from your working folder.
4. Click **Open**. The system returns you to the *Drill Hole – Import External Database* dialog box and displays the file name you wish to import.
5. Click **OK**. The system scans the file and displays the first of four dialog boxes from the *Drill Hole Import Wizard*.

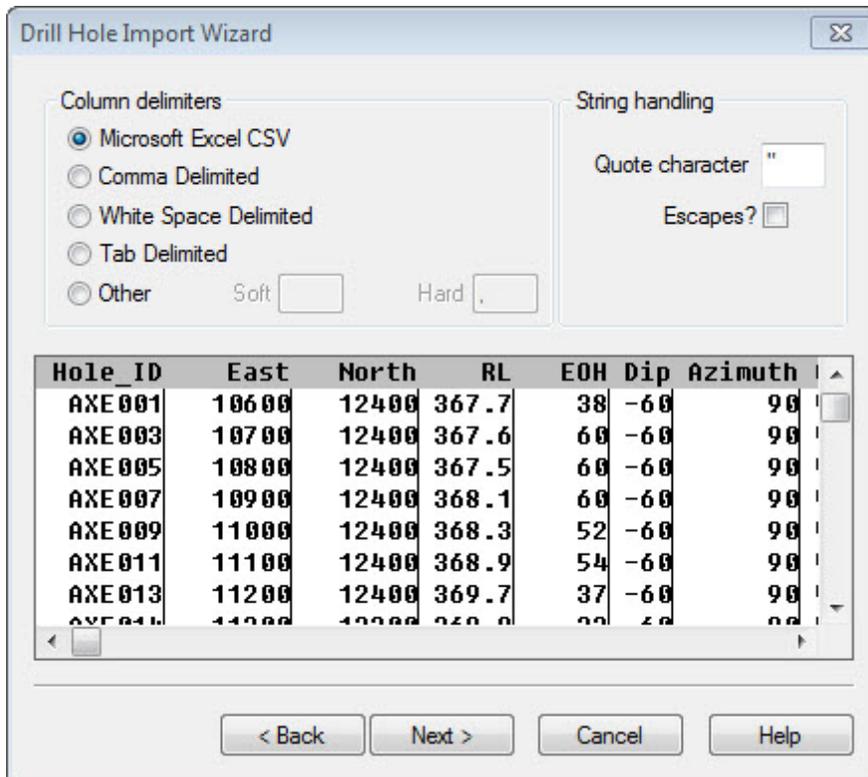


 Note that the system determines the Data Input format and has intuitively predicted that the Types of Data to import is Hole Collar Data.

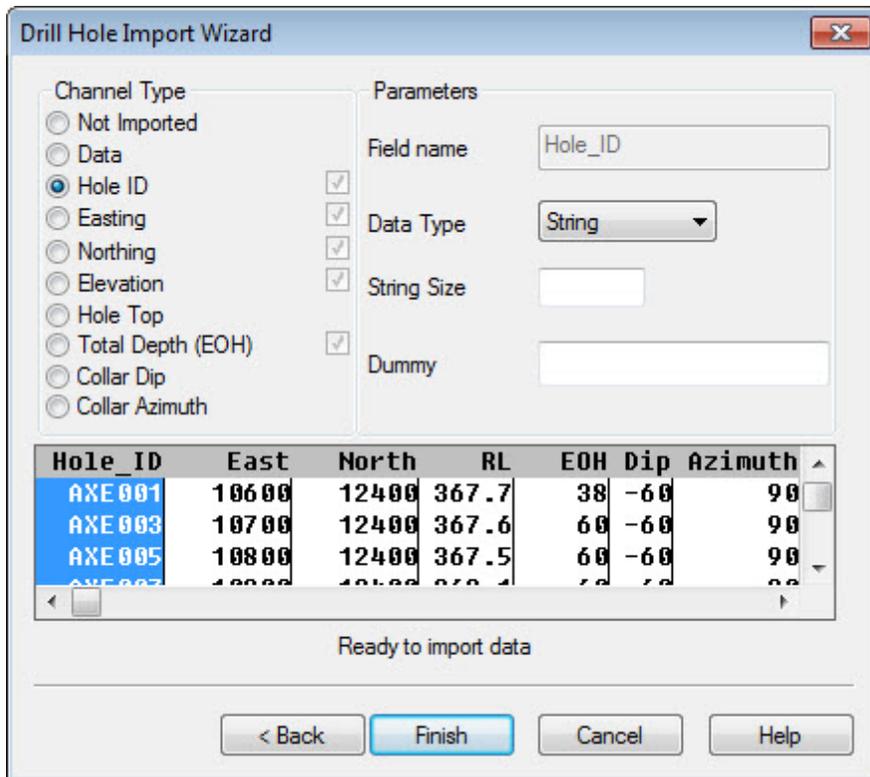
- Use the horizontal scroll bar to see all of the fields in the file or simply click the **Next>** button. The system displays the second dialog box in the *Drill Hole Import Wizard*.



7. The system determines the *File Type* and in the four fields in the middle of the dialog box specifies which line in the file contains the data headings (i.e. channel names), data units ("m" or "ft" etc.), which line to begin importing data and the number of lines to display in the preview window.
8. Click the **Next>** button. The system displays the third dialog box in the *Drill Hole Import Wizard*.



9. Specify the *Column delimiters* for the type of character used to separate the column text. The system displays the data in columns by drawing lines in the preview window indicating the way in which it is preparing to import your data.
10. Click the **Next>** button to continue. The system displays the fourth and final dialog box in the *Drill Hole Import Wizard*.



- The *Import Wizard* has scanned your data and determined the type of data with which you are working (i.e. *Channel Type*). It is always good practice to review your data to ensure that the wizard has selected the correct columns. The *Parameters* area in the dialog box shows the name and type of data of the column highlighted in the preview window.

 *The Data Type of Database Fields that contain alphanumeric data (for example, sample numbers, rockcodes etc.) must be classified as String.*

- Click the **Finish** button. The system imports the collar data and displays it in the spreadsheet window.
- At this point, we recommend that you examine the database table carefully. Start by confirming that all columns of data in the original CSV file are present in the database.

Importing Survey Data (CSV/text format)

Various types of surveys (acid, gyroscope, magnetic orientation, etc.) can be used to record hole depth (depth measured from the drillhole collar). For Target for ArcGIS, you can use survey data in one of two forms:

> Hole	> Depth	> Azimuth	> Dip	>
> Hole	> Depth	> Easting	> Northing	> Elevation

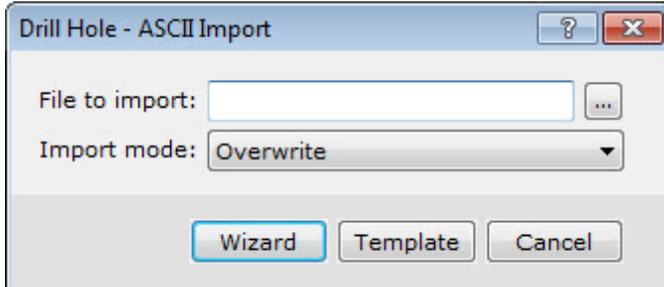
Before importing data, you must make sure that you have all fields as shown in one of these configurations (i.e. these fields are required on import).

By convention:

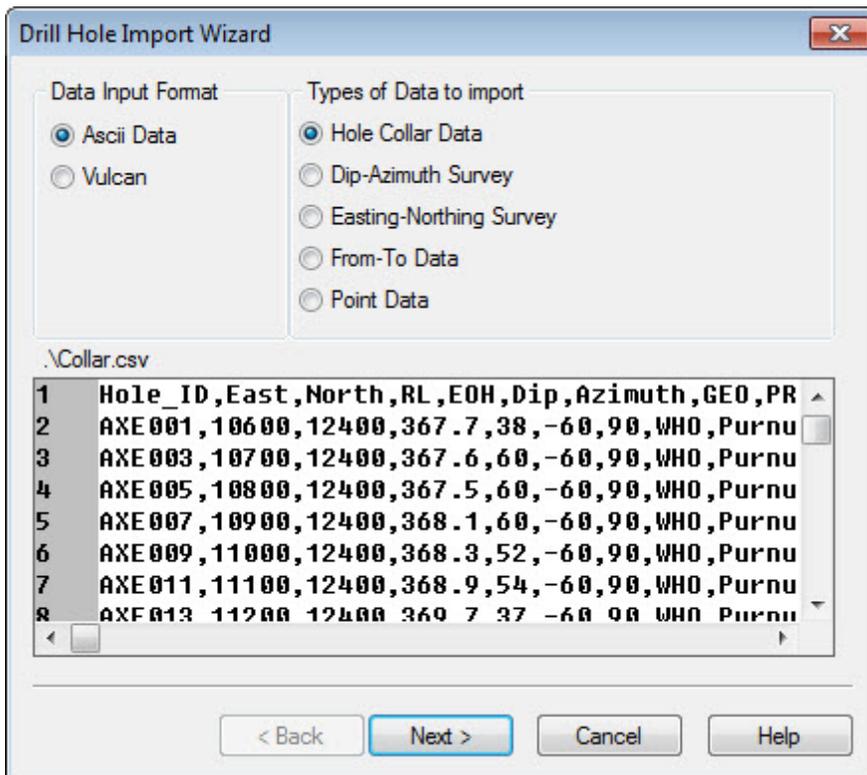
- Depth is the distance measured into the hole from the collar, increasing from zero.
- Azimuth is in degrees, increasing positively in a clockwise sense from North (i.e. N is 0 degrees, E is 90 degrees).
- Depth, Easting, Northing and Elevation are in the same units as default units set in *Edit\Oasis montaj settings* dialog.

To Import Survey Data

1. On the *Data* menu, select **Import ..**
2. Select **Text file**. The *Drill Hole – Ascii Import Wizard* dialog appears.



3. Use the *Browse* button to select the survey file from your working folder.
4. Click **Open**. The system returns you to the *Drill Hole – Import External Database* dialog box and displays the file name you wish to import.
5. Click the **OK** button. The system scans the file and displays the first of four dialog boxes from the *Drill Hole Import Wizard*.



 Note that the system determines the Data Input Format and the Types of Data to import.

6. Continue clicking the **Next** button and configuring the dialog screens as required.
7. When complete, click the **Finish** button. The system imports the data and displays it in the spreadsheet window.

 If you have problems with your data file, the system will attempt to open an ASCII file and display a list of warnings or errors. If you have not yet configured a text editor in your system, you may be prompted for one. In this case, search your system for your text editor (i.e. Notepad, which can be located in the Windows folder).

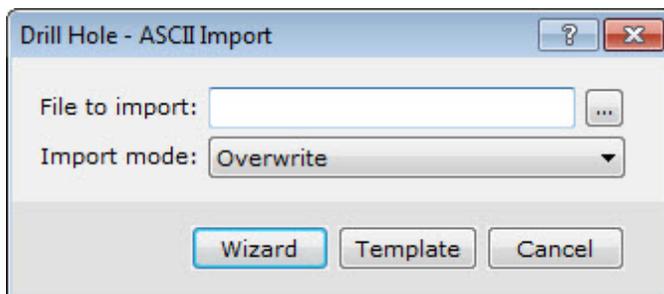
Importing Geochemical Assay Data

Geochemical assay data are typically acquired by obtaining core or rotary drill samples over specific depth ranges (From-To ranges) and sending samples to an assay laboratory. Numerical results are typically returned from the laboratory in electronic format and can be imported quickly into the system. Before import, you must make sure that your data files contain the following information – HOLE ID , FROM , TO and a series of ASSAY results.

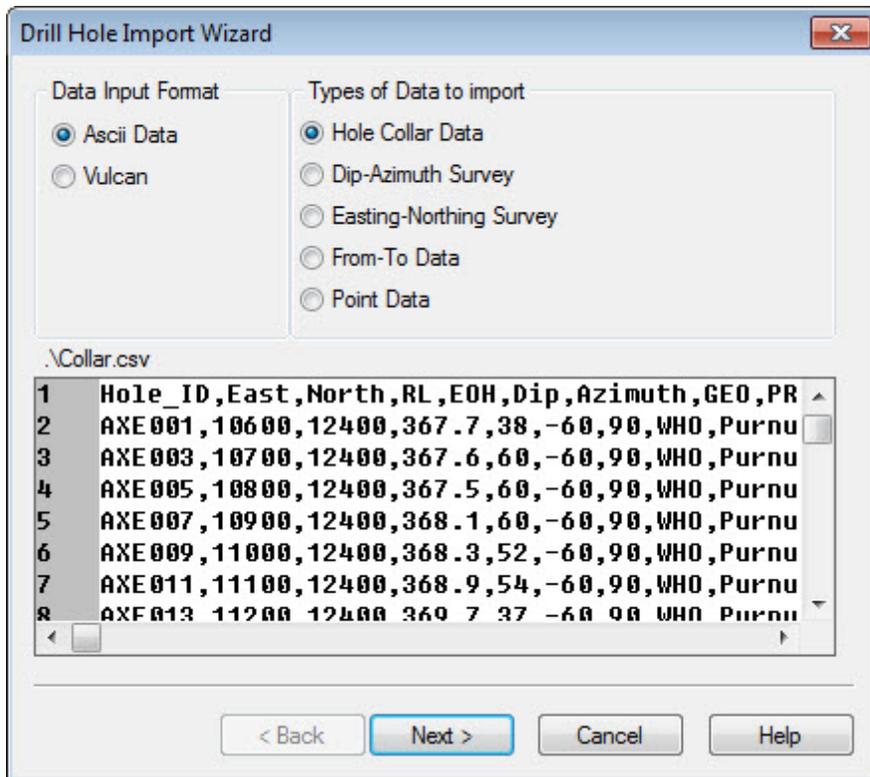
Note that the Length Weighted Mean calculations have been added to the Statistics tools. By highlighting a selected section of your drillhole database (To-From database), you can view the calculated Length and Length Weighted Mean values on the Stats Report dialog. This makes it easy to quickly find out the length of several irregularly spaced samples as well as the length weighted mean assay value.

To Import Geochemical Data

1. On the *Data* menu, select **Import** .
2. Select **Text file**. The *Drill Hole – Ascii Import Wizard* dialog appears.



3. Use the *Browse* button to select the file from your working folder.
4. Click **Open**. The system returns you to the *Drill Hole – ASCII Import Wizard* dialog box and displays the file name you wish to import.
5. Click **Wizard**. The system scans the file and displays the first of five dialog boxes from the *Drill Hole Import Wizard* .

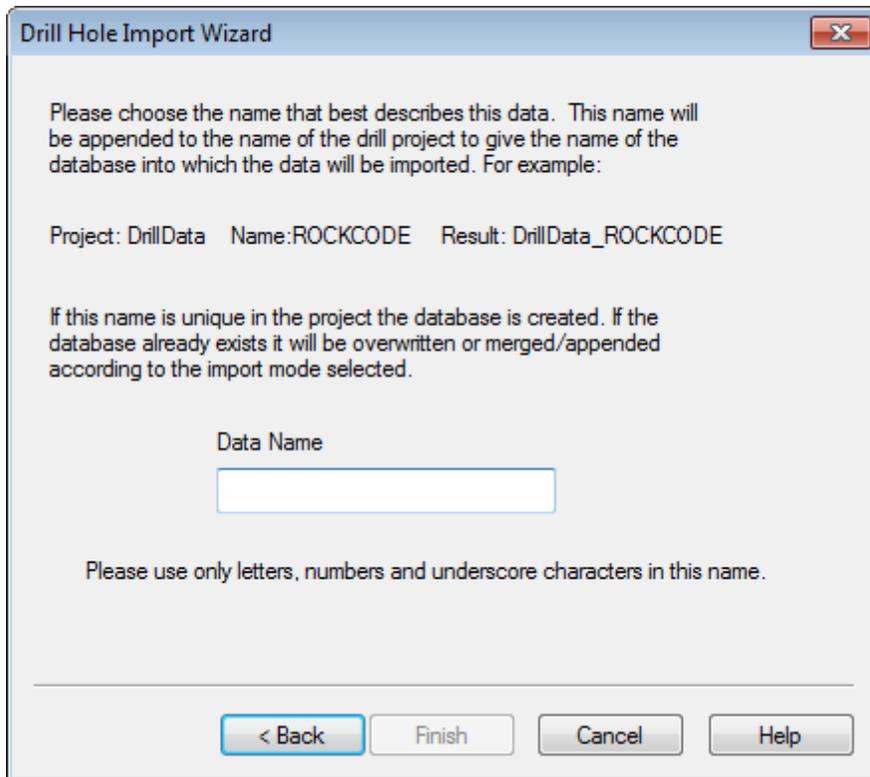


 Note that the system determines the 'Data Input Format' and the 'Types of Data to import'.

6. Continue clicking the **Next** button and configuring the dialog screens as required.

 When importing Assay data all elements are assigned the Class 'Assay' (Channel Type). Standards and Duplicates are also identified, enabling Chimera Geochemistry users to extract the information using the normal Chimera tools.

7. Before the import is complete, the system displays a fifth dialog box. The purpose of this dialog box is to enable you to specify a unique name or description for your data. The name chosen will be appended to the corresponding holes in the database for easier access and recognition of your data.



- Specify a *Data Name* for this data and click the **Finish** button. The system imports the data and displays it in the spreadsheet window.

Importing Geological Data

The system provides a versatile environment for adding a wide variety of geological parameters ranging from rock codes, extended text descriptions, alteration types, contact data such as fractures or faults, and other core log information that is important in your drilling project.

In general, this type of information consists of text but you can also add numerical values, for instance, if you want to retain numeric codes for statistical purposes or you want to run your own advanced classification strategies in Target for ArcGIS .

The steps to import geological data are the same as shown above in the **Importing Geochemical Data** section.

Quality Control and Quality Assurance Tests

The Target for ArcGIS system provides the tools to enable you to perform Quality Control and Quality Assurance tests on each of the five different data types (Collar Data, Dip/Azimuth Survey, Easting-Northing Survey, From-To Data, and Point Data).

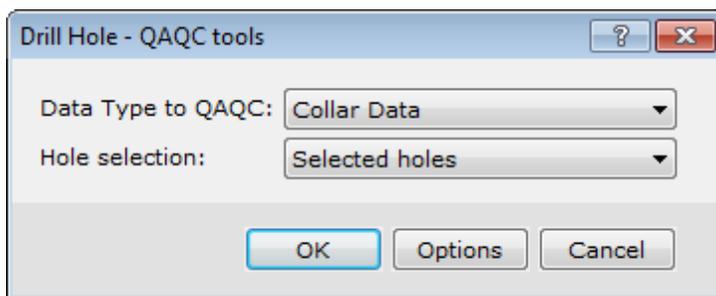
Running Quality Control and Assurance Tests

The *Drill hole - QA/QC tools* dialog asks you to select the type of data to perform the QA/QC tests on. For each data type there are different sets of options you can enable/disable using the **Options** button. The system saves these settings to the *geosoft.ini* file in your *Geosoft\User\ini* directory.

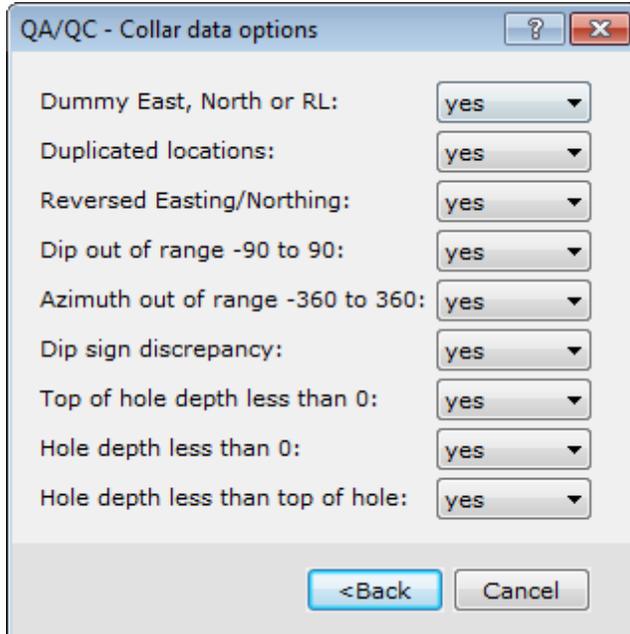
The individual QA/QC tests are run automatically during data import. Each test produces its own log file; e.g. Collars (*Collars.log*), From-To (*FromToData.Log*), All data (*QAQC.log*). If no problems are found you receive a message such as: "No problems were detected with the Dip-Azimuth Survey data."

To Run the QA/QC Test

1. On the *Target Drillhole* toolbar, select **Data**.
2. Select **QA/QC**. The *Drill hole - QA/QC tools* dialog appears.



3. From the **Data Type to QAQC** dropdown list, select the data type you want to perform the QA/QC test on. To see the list of options that the select data type will use for testing, click the **Options** button.



 In this case, the QA/QC – Collar data options dialog is displayed.

4. Once you have modified your test options, click the **<Back** button to return to the *Drill hole - QA/QC tools* dialog.
5. Click **OK** to run the test. If no errors are found the *Target for ArcGIS QA/QC* dialog will be displayed telling you that no errors were detected.
6. Click **OK** to close the *Target for ArcGIS QA/QC* dialog.

How-To Guide Publication Date: 25/02/2013

Copyright 2013 Geosoft Inc. All rights reserved.