

Export and Import Field Tests / Templates

Program: Stratigraphy
File: Demo02.gsg

This engineering manual describes how to import and export data from field tests. Data can be exported in table (MS Excel, Open Office, Google Sheets) or XML formats. For import, there are many more options, especially local formats used all around the world.

Spreadsheet programs are very popular and effective, and it can make more sense to edit and store the data in their formats. Very often the users already have the data in these formats and they need to import them into GEO5 programs.

The XML format is used for communication with other programs and databases. Its use only applies to a small range of customers – therefore we will not cover it in this manual.

We will describe three scenarios in this manual:

1. Export of field tests, modification of the data in MS Excel, and subsequent reimport
2. Naming individual exported and imported data (mapping)
3. Export / Import data from spreadsheets

Export of field tests, modification of the data in MS Excel, and subsequent reimport

Open the “Demo02.gsg” file, which is installed together with GEO5 programs into the “FINE” folder in public documents.

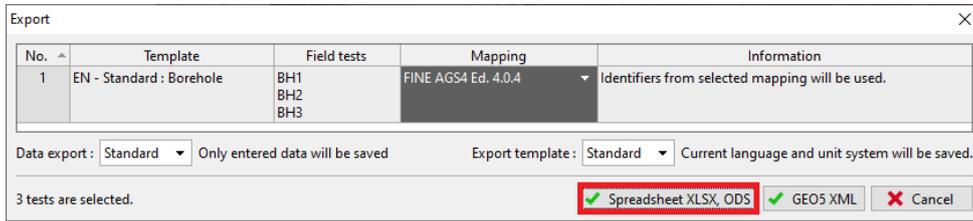
In the frame “Field Tests”, select the data for export (BH 1-3), and press the “Export” button on the toolbar.

The screenshot shows the GEO5 2021 software interface. The main window displays a 3D geological model with various layers and borehole locations. Below the model is a table with the following data:

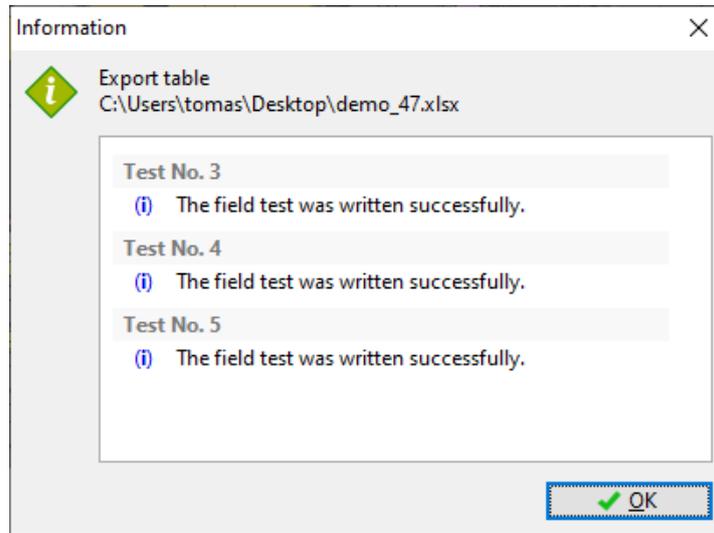
No.	Test name	Test type	x [m]	y [m]	z [m]	Depth of 1. point d ₁ [m]	Depth d _m [m]	State of test
1	BH5	Borehole	1043303,59	747487,88	234,26	0,00	10,00	creates a soil profile
2	BH6	Borehole	1043296,96	747480,64	331,09	0,00	8,50	creates a soil profile
3	BH1	Borehole	1043318,41	747493,73	336,15	0,00	6,70	creates a soil profile
4	BH2	Borehole	1043288,11	747518,07	331,10	0,00	6,60	creates a soil profile
5	BH3	Borehole	1043212,17	747523,26	325,29	0,00	8,10	creates a soil profile
6	BH4	Borehole	1043276,16	747466,79	330,24	0,00	9,00	creates a soil profile

The interface also includes a toolbar with an 'Export' button, a 'Field Tests' panel on the right, and a 'Copy' button at the bottom right.

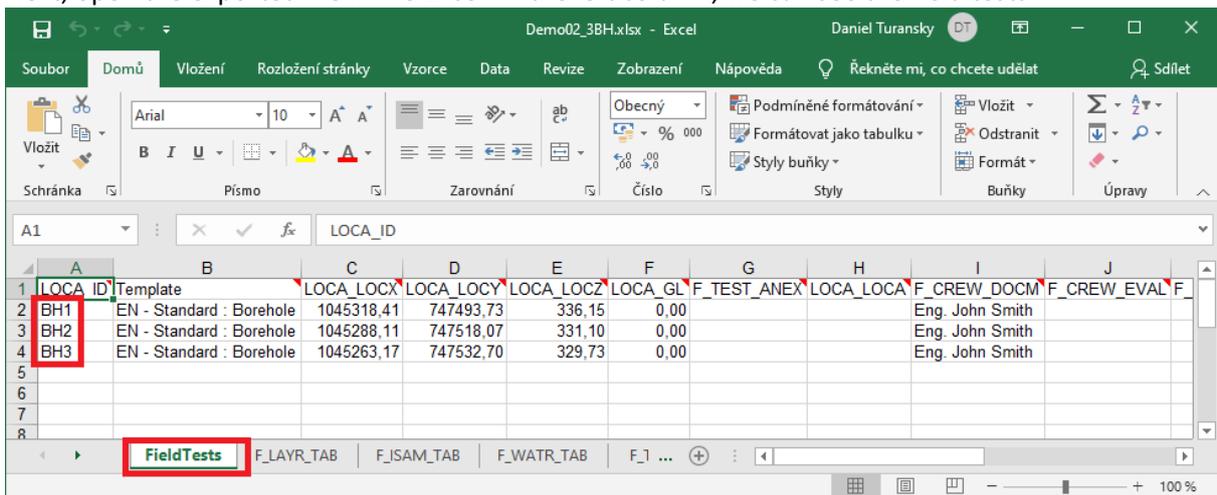
Press the button “Spreadsheet XLSX, ODS” to save them. We will leave the mapping as “FINE AGS4 Ed. 4.0.4” (according to the international standard AGS - Association of Geotechnical and Geoenvironmental Specialists), which is default for all templates.



We will name the exported file (Demo02_3BH) and save it. The program will confirm the export in a dialog window.



Next, open the exported file in MS Excel. In the left column, we can see the field tests.



Other data can be found in the individual tabs. The name of the test must always be in the first column, to make the relevance of the data clear. The number of tabs (layers, water, samples..) depends on the template used in GEO5. All data from the template is exported into the spreadsheet.

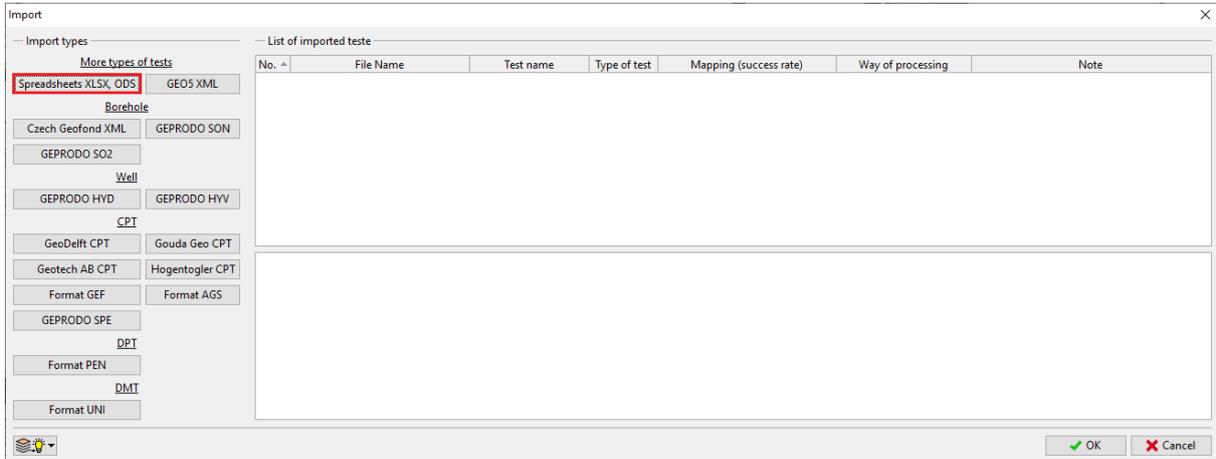
LOCA_ID	F_LAYER_THCK	GEOL_GEO2	F_GEOL_SOPA Pattern	F_GEOL_SOPA PattColor	F_GEOL_SOPA PattBackground
BH1	0.20	Made Ground	GEPRODO_1	clBlack	\$008F8FFF
BH1	0.30	Made Ground	GEPRODO_1	clBlack	\$008F8FFF
BH1	0.50	Sandstone	GEPRODO_181	clBlack	\$005ED7FF
BH1	0.30	Sandstone	GEPRODO_181	clBlack	\$005ED7FF
BH1	0.90	Siltstone	GEPRODO_118	clBlack	\$00FF8FDA
BH1	0.30	Siltstone	GEPRODO_118	clBlack	\$00FF8FDA
BH1	0.70	Claystone	GEPRODO_121	clBlack	clAqua
BH1	1.40	Siltstone	GEPRODO_118	clBlack	\$00FF8FDA
BH1	0.40	Claystone	GEPRODO_121	clBlack	clAqua
BH1	1.30	Siltstone	GEPRODO_118	clBlack	\$00FF8FDA
BH1	0.40	Sandstone	GEPRODO_181	clBlack	\$005ED7FF
BH2	0.70	Made Ground	GEPRODO_1	clBlack	\$008F8FFF
BH2	0.70	Loess Silt	GEPRODO_118	clBlack	\$000080FF
BH2	2.00	Sandstone	GEPRODO_181	clBlack	\$005ED7FF
BH2	0.90	Shale, fully weathered	GEPRODO_137	clBlack	\$008D8D8D
BH2	1.30	Shale, fully weathered	GEPRODO_137	clBlack	\$008D8D8D
BH2	1.00	Shale, weathered	GEPRODO_137	clBlack	\$008D8D8D
BH3	0.70	Made Ground	GEPRODO_1	clBlack	\$008F8FFF
BH2	1.80	Shale, weathered	GEPRODO_137	clBlack	\$008D8D8D

We can now edit, delete, or add data in the table. We will make these changes:

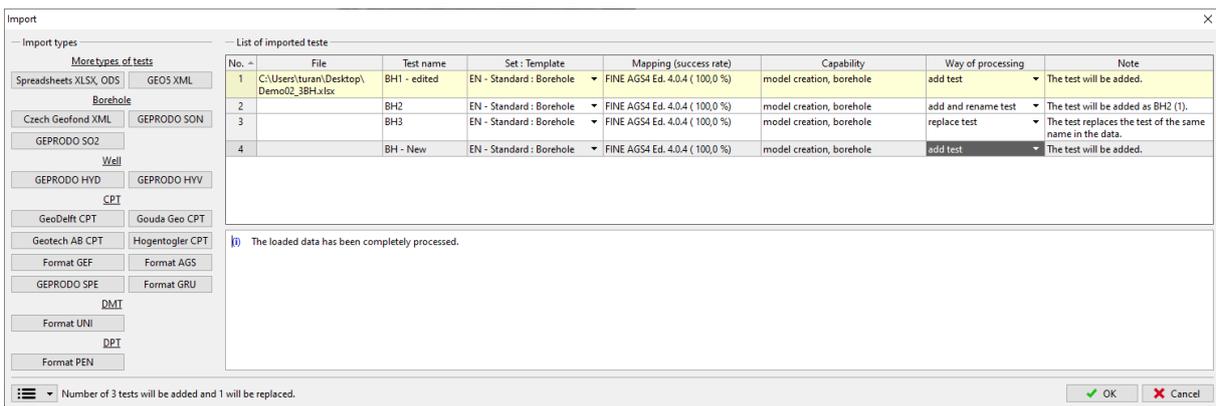
- Rename borehole "BH1" to "BH1 - edited"
- Change the Y coordinate of borehole BH2 to "XXX" – to demonstrate how the program deals with incorrect input
- Add a new borehole "BH - New"

LOCA_ID	Template	LOCA_LOCX	LOCA_LOCY	LOCA_LOCZ	LOCA_GL	F_TEST_ANEX	LOCA_LOCA	F_CREW_DOCM
BH1 - edited	EN - Standard : Borehole	1045318,41	747493,73	336,15	0,00			Eng. John Smith
BH2	EN - Standard : Borehole	1045288,1	XXX	331,10	0,00			Eng. John Smith
BH3	EN - Standard : Borehole	1045263,17	747542,70	329,73	0,00			Eng. John Smith
BH - New	EN - Standard : Borehole	1045233,17	747542,70	329,73	0,00			

Now, we will return into the Stratigraphy program and import the edited file. In the frame “Field Tests”, press the “Import” button. We will select the import type as “Spreadsheets XLS, ODS”, and load the file.



The program will analyze the data and will offer options how to further process the boreholes.



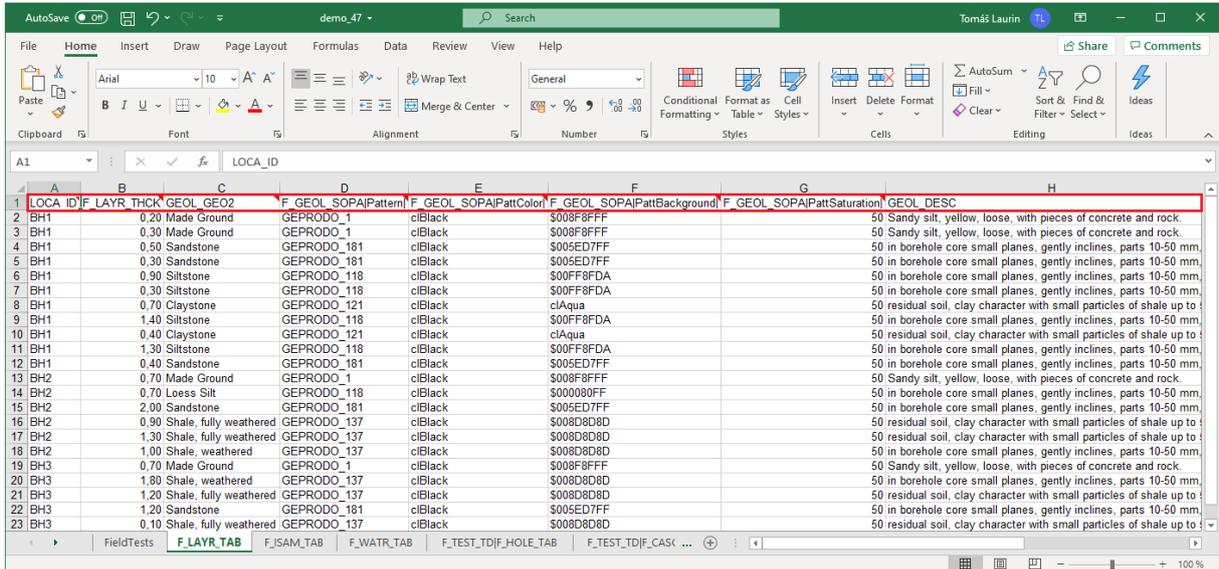
After the import, we can see:

- The edited “BH3” borehole has replaced the original “BH3” borehole
- The borehole BH2 with the incorrect Y coordinate has been imported, and is displayed as “out of site”
- The boreholes “BH1 - edited” and “BH - new” have been loaded, but BH1 - edited” do not create a profile, as its coordinates are equal to the ones of already existing boreholes.

No.	Test name	Set : Template	Capability	Coordinate			Vertical offset of the origin	Depth	State of test
				x [m]	y [m]	z [m]	d_0 [m]	d_{tot} [m]	
1	BH5	EN - Standard : Borehole	borehole	1045300,59	747487,88	334,26	0,00	10,00	creates a soil profile
2	BH6	EN - Standard : Borehole	borehole	1045286,56	747480,64	333,09	0,00	8,50	creates a soil profile
3	BH1	EN - Standard : Borehole	borehole	1045318,41	747493,73	336,15	0,00	6,70	creates a soil profile
4	BH2	EN - Standard : Borehole	borehole	1045288,11	747518,07	331,10	0,00	6,60	creates a soil profile
5	BH3	EN - Standard : Borehole	borehole	1045263,17	747532,70	329,73	0,00	5,10	creates a soil profile
6	BH4	EN - Standard : Borehole	borehole	1045276,16	747466,78	330,24	0,00	9,00	creates a soil profile
7	BH1 - edited	EN - Standard : Borehole	borehole	1045318,41	747493,73	336,15	0,00	0,00	does not create a soil profile
8	BH2 (1)	EN - Standard : Borehole	borehole	1045288,11		331,10	0,00	6,60	out of site
9	BH - New	EN - Standard : Borehole	borehole	1045233,17	747542,70	329,73	0,00	0,00	creates a soil profile

Naming individual exported and imported data (mapping)

In the previous example, we exported tests using AGS mapping. This means that the individual columns and tabs in the file were named according to the AGS 4.0.4. standard. However, for work with the spreadsheet, this naming could be inconvenient.

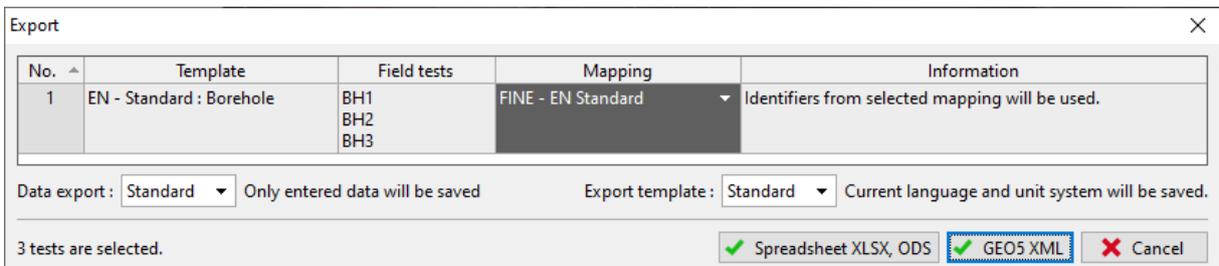


The program exports the name, symbol, unit, and the variable type into the comments in each cell.

LOCA_ID	F_LAYR_THCK	Thickness	F_G
BH1	0,20	Mt	c BI
BH1	0,30	M [m]	c BI
BH1	0,50	Sa Double Length_m F_LAYR_THCK	c BI
BH1	0,30	Sandstone	c BI
BH1	0,90	Siltstone	c BI
BH1	0,30	Siltstone	c BI
BH1	0,70	Claystone	c BI
BH1	1,40	Siltstone	c BI

This however might not suit everybody. Therefore it is possible to use other local mapping, or create a new one according to our needs.

We will export the same file with the “FINE-EN Standard” mapping.



The identifiers in the spreadsheet are now replaced with standard names.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Name	TestType	X	Y	Z	1. Point	Annex	Location	Documented	Evaluated	Processed	Date-start	Date-end	Foreman	Drilling equipm
2	BH1	BoreHole	1045318,41	747493,73	336,15	0,00			Eng. John Smith			18.03.2019	18.03.2019		
3	BH2	BoreHole	1045288,11	747518,07	331,10	0,00			Eng. John Smith			18.03.2019	18.03.2019		
4	BH3	BoreHole	1045263,17	747532,70	329,73	0,00			Eng. John Smith			18.03.2019	18.03.2019		
5															
6															
7															
8															
9															

The mapping is defined in the template. One template can have several mapping options. All templates contain the AGS mapping set as default, while some templates also contain different mapping options according to the country for which they are designed.

No.	Name	Type	Parameters	Conditional input	Comment
1	Test name	String			General / Fixed
2	Overall depth	Number	Symbol: d _{tot} 0,89 m 0,89 ft		Read only - automatically determined from data of field test / General / Fixed
3	Coordinate X	Number	0,89 m 0,89 ft		General / Fixed
4	Coordinate Y	Number	0,89 m 0,89 ft		General / Fixed
5	Coordinate Z	Number	0,89 m 0,89 ft		General / Fixed
6	Vertical offset of the origin	Number	Symbol: d _v 0,89 m 0,89 ft		General / Fixed
7	GWT bored	String	Symbol: GWT _b		Read only - list of GWT bored from GWT table / Borehole-Well-SPT-PMT
8	GWT steady	String	Unit description: m, ft		Read only - list of GWT steady from GWT table / Borehole-Well-SPT-PMT
9	Layers	Table	With layer thickness Number of elements: 6		Borehole-Well-SPT-PMT / Fixed

No.	Name	Protocol type
1	Borehole - Field test	Field tests
2	Borehole - Soil profile	Soil Profiles

No.	Name	Comment
1	FINE - AGS4 Ed. 4.0.	
2	FINE - EN Standard	

No.	Name	Type	Comment	Identifier
1	Test name	String	General / Fixed	Name
2	Overall depth	Number	Read only - automatically determined from data of field test / General / Fixed	Depth
3	Coordinate X	Number	General / Fixed	X
4	Coordinate Y	Number	General / Fixed	Y
5	Coordinate Z	Number	General / Fixed	Z
6	Vertical offset of the origin	Number	General / Fixed	1. Point
7	GWT bored	String	Read only - list of GWT bored from GWT table / Borehole-Well-SPT-PMT	GWT - Drilled
8	GWT steady	String	Read only - list of GWT steady from GWT table / Borehole-Well-SPT-PMT	GWT - Steady
9	Layers	Table	Borehole-Well-SPT-PMT / Fixed	Layer
9.1	Thickness	Number	General / Fixed	Thickness
9.2	Depth	Number	Read only - automatically determined from Thickness	Depth
9.3	Soil name	String	Borehole-Well-SPT-PMT / Fixed	Soil
9.4	Soil pattern	Pattern and color	Borehole-Well-SPT-PMT / Fixed	Pattern
9.5	Layer description	String	Borehole-Well-SPT-PMT / Fixed	Description
9.6	Data - Basic	Group		Data - Basic
9.6.1	Stratigraphy	String	Borehole-Well-SPT-PMT / User	Stratigraphy
9.6.2	Classification according to EN ISO 14688-1	String	Soil/Rock Test / User	EN ISO 14688-1
9.6.3	Classification according to EN ISO 14688-2	String	Soil/Rock Test / User	EN ISO 14688-2
9.6.4	RQD	String	Soil/Rock Test / User	RQD
9.6.5	Notes	String	General / User	Remarks
10	Samples	Table	Borehole-SPT-PMT / Fixed	Sample
10.1	Depth from	Number	General / Fixed	From
10.2	Depth to	Number	General / Fixed	To
10.3	Sample type	Enumeration	Borehole-SPT-PMT / Fixed	Type

It is also possible to create user-defined mappings. When creating a mapping, it is necessary to keep in mind that each identifier has to be unique and clear. The program warns us if the same identifier is already used by displaying it in red. Having multiple values with the same identifier can cause problems when importing the data.

Edit mapping for export and import

Name: CS Comment:

No.	Name	Type	Comment	Identifier
1	Test name	String	General / Fixed	Name
2	Overall depth	Number	Read only - automatically determined from data of field test / General / Fixed	Depth
3	Coordinate X	Number	General / Fixed	Y
4	Coordinate Y	Number	General / Fixed	Y
5	Coordinate Z	Number	General / Fixed	Y
6	Vertical offset of the origin	Number	General / Fixed	T - Point
7	GWT bored	String	Read only - list of GWT bored from GWT table / Borehole+Well+SPT+PMT	GWT - Drilled
8	GWT steady	String	Read only - list of GWT steady from GWT table / Borehole+Well+SPT+PMT	GWT - Steady
9	Layers	Table	Borehole+Well+SPT+PMT / Fixed	F_LAYR_TAB
9.1	Thickness	Number	General / Fixed	Thickness
9.2	Depth	Number	Read only - automatically determined from Thickness	Depth
9.3	Soil name	String	Borehole+Well+SPT+PMT / Fixed	Depth
9.4	Soil pattern	Pattern and color	Borehole+Well+SPT+PMT / Fixed	Pattern
9.5	Layer description	String	Borehole+Well+SPT+PMT / Fixed	Description
9.6	Data - Basic	Group		
9.6.1	Stratigraphy	String	Borehole+Well+SPT+PMT / User	Stratigraphy
9.6.2	Classification according to EN ISO 14688-1	String	Soil/Rock Test / User	EN ISO 14688-1
9.6.3	Classification according to EN ISO 14688-2	String	Soil/Rock Test / User	EN ISO 14688-2
9.6.4	RQD	String	Soil/Rock Test / User	RQD
9.6.5	Notes	String	General / User	Remarks
10	Samples	Table	Borehole+SPT+PMT / Fixed	Sample
10.1	Depth from	Number	General / Fixed	From
10.2	Depth to	Number	General / Fixed	To
10.3	Sample type	Enumeration	Borehole+SPT+PMT / Fixed	Type

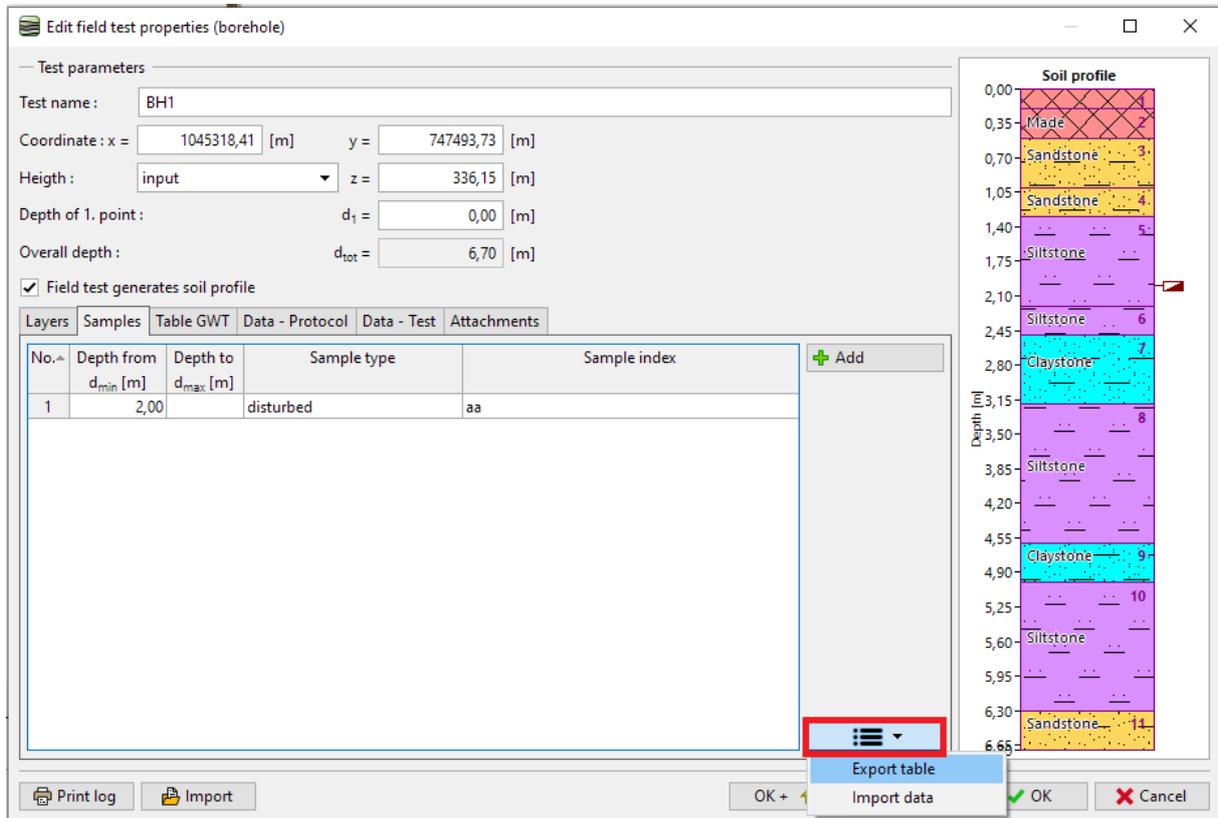
Dictionary of identifiers: AGS3 Edition 3.1a - May 2005

OK + OK Cancel

Export / Import data from spreadsheets

In many cases, we don't need to work with the whole field test, but only edit / import external data from the spreadsheet. Function Export/Import is available in most GEO5 programs

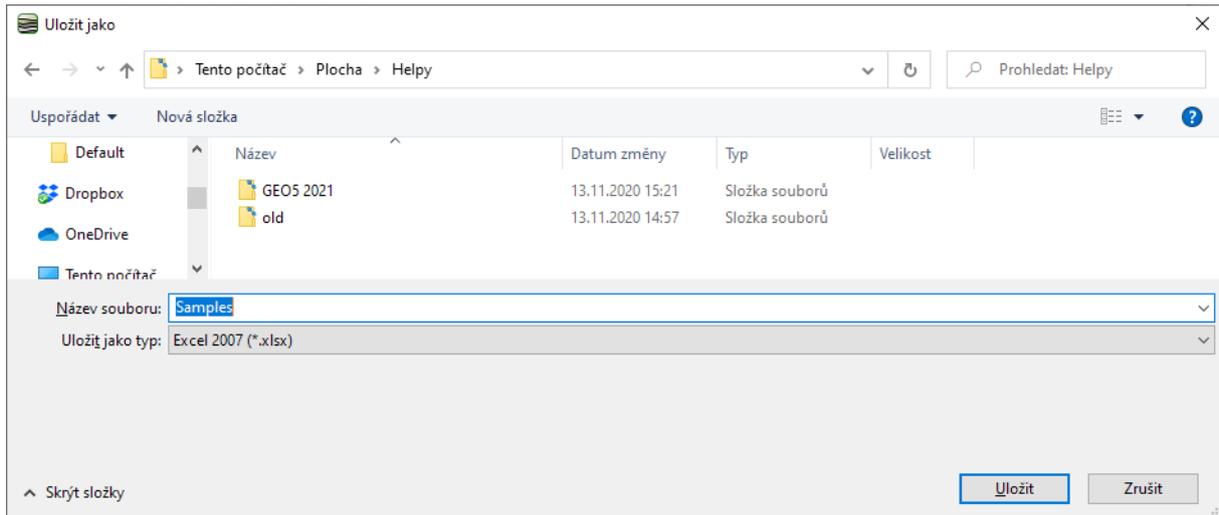
We will describe this function on the table of samples in the BH1 borehole. Press the button for export / import of data.



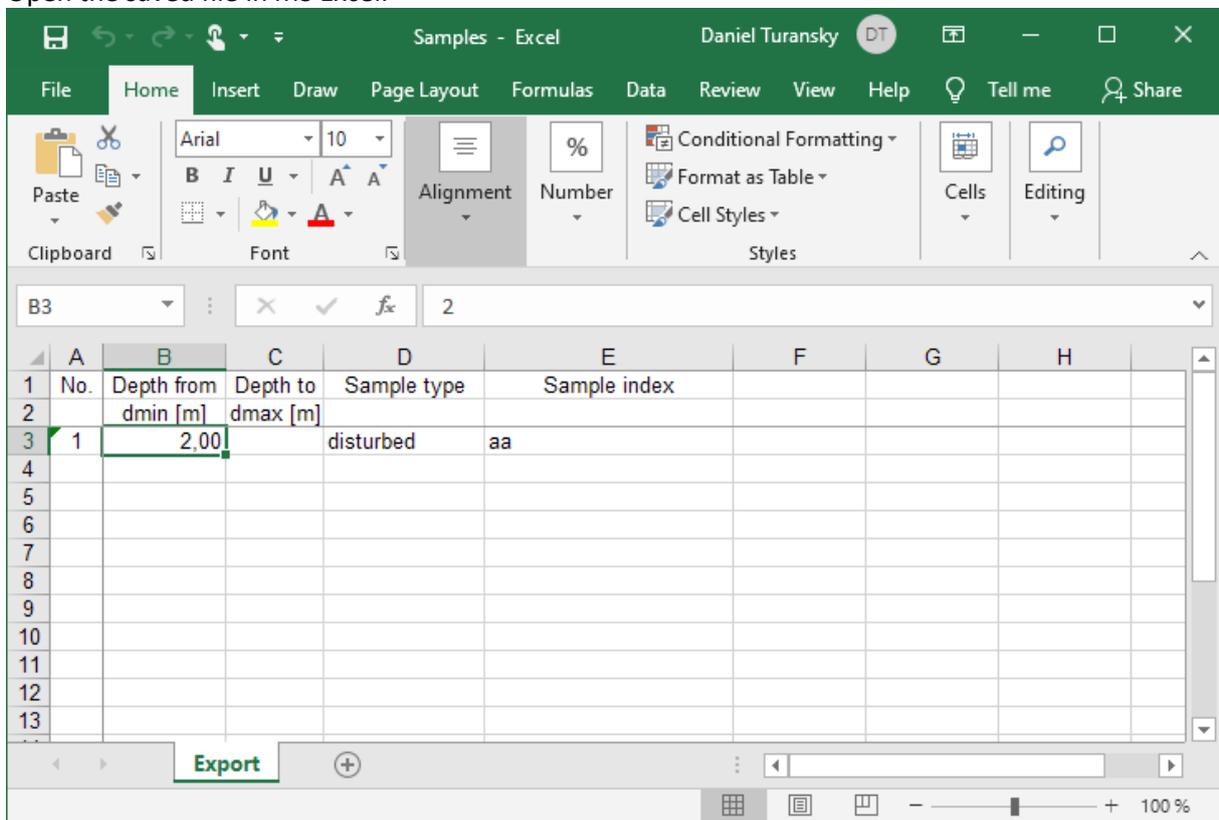
Note : Button  is located alongside the tables in all GEO5 programs. It may contain different options for work with the table, such as:

- Export table
- Import data into table
- Exchange values of columns in the table
- Edit values in columns
- Remove rows with data outside the range etc.

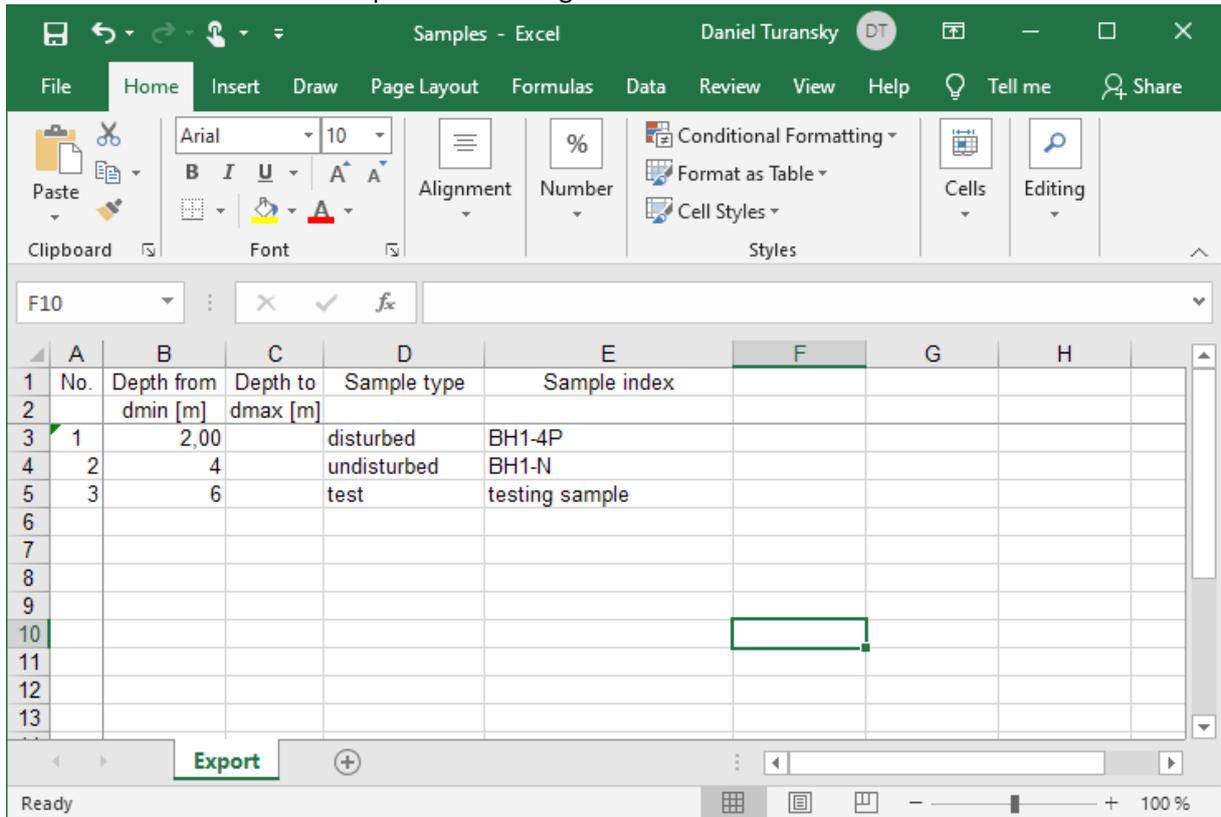
We will name and save the file.



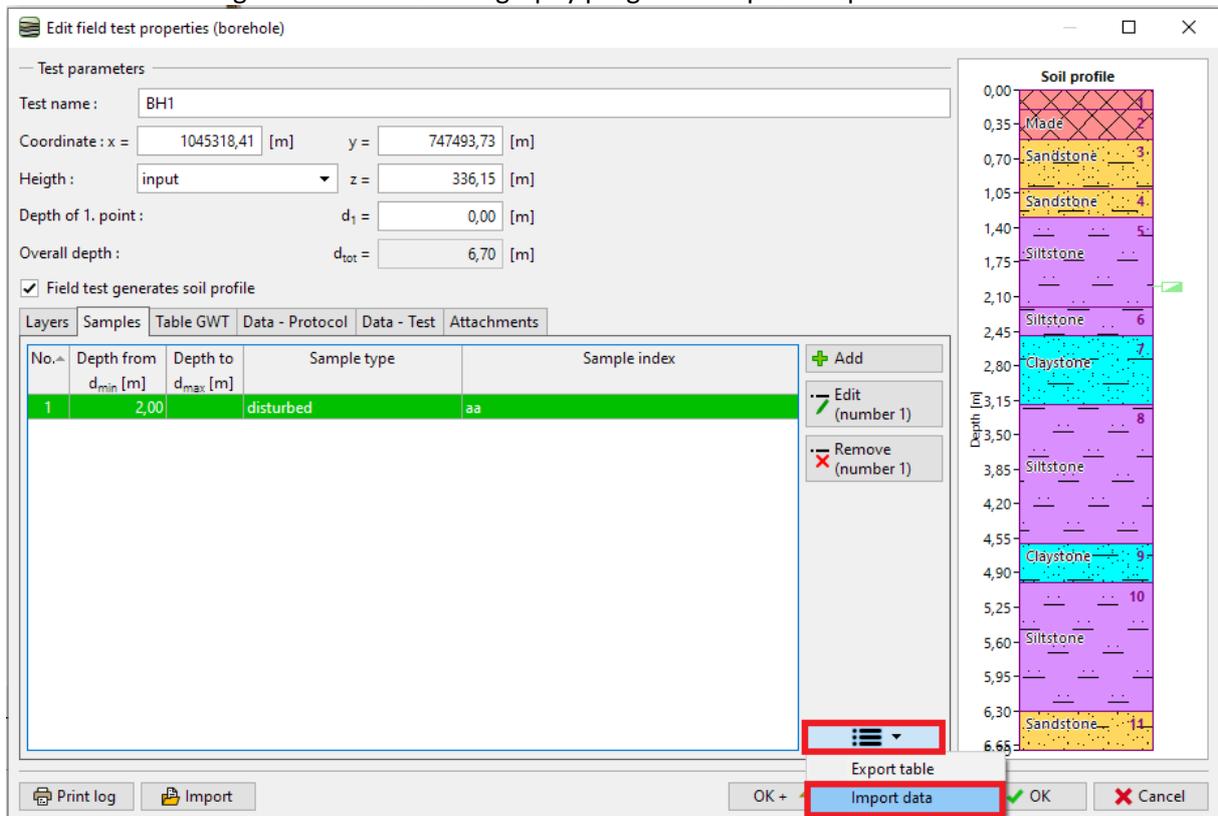
Open the saved file in MS Excel.



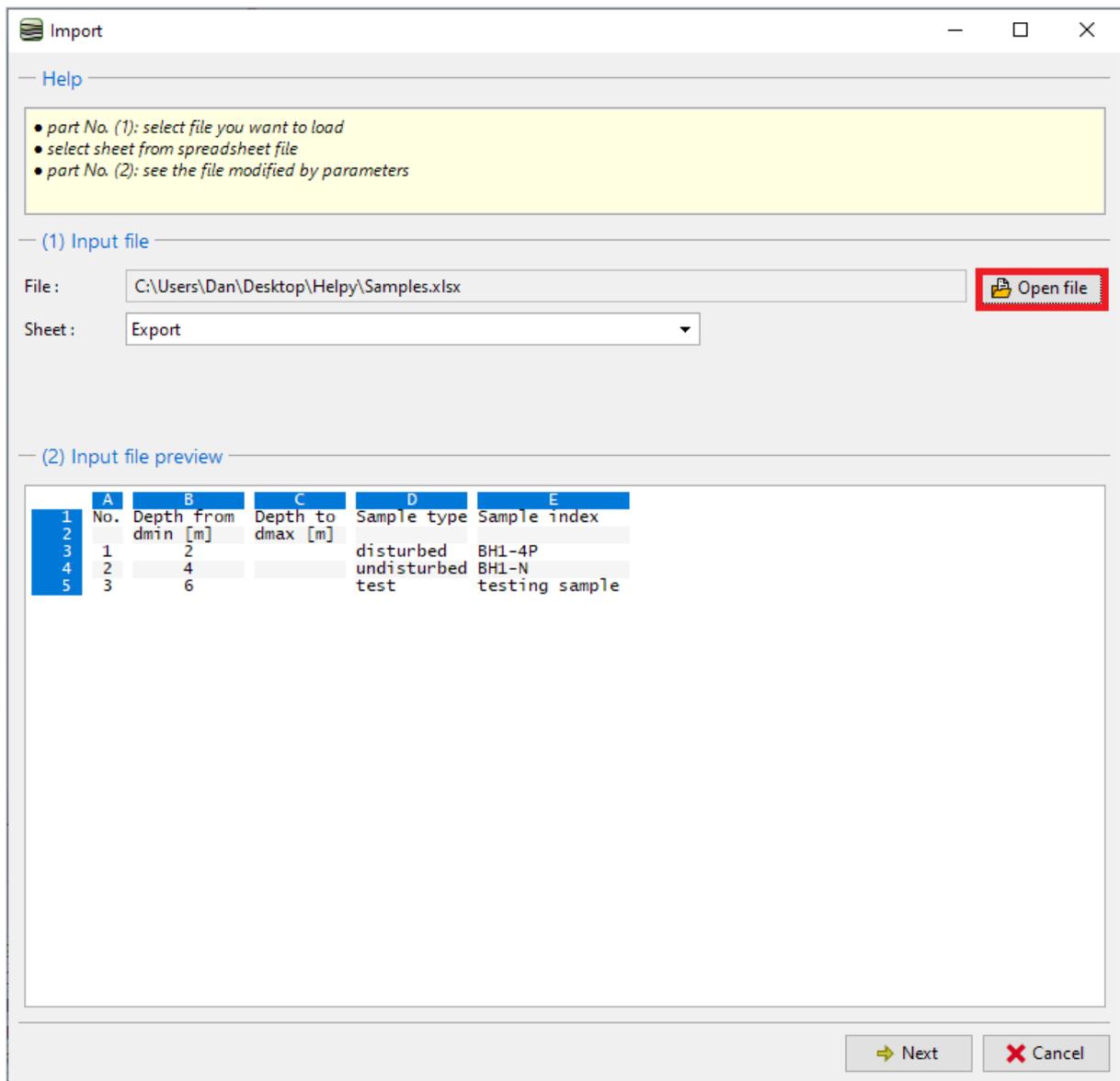
We will edit the name of the first sample and add two more. We named the type of the third sample as "test" to demonstrate the options of loading enumeration.



Return to the dialog window in the Stratigraphy program and press import.



We will load the file. The data will be shown in the dialog window.



Note: In this case, we import data which we exported from the table before. It is however possible to import any table data from different sources in different formats.

In the next section (3), we can select which rows we want to import. In our case data start on row 3. The selection of rows is also important when we only need to import part of the data – e.g. samples related to the given borehole.

In section (4) we can see the input file divided into individual columns.

Import

— Help —

- part No. (2): see the modified input file
- part No. (3): possibly modify the parameters of the splitting file into columns
- part No. (4): see the input file split into columns

— (2) Input file preview —

	A	B	C	D	E
1	No.	Depth from	Depth to	Sample type	Sample index
2		dmin [m]	dmax [m]		
3	1	2		disturbed	BH1-4P
4	2	4		undisturbed	BH1-N
5	3	6		test	testing sample

— (3) Parameters for input file splitting into columns —

Read from row : to row : Header from row : to row :

— (4) Input file split into columns —

A	B	C	D	E
(123)	(123)	(123,45)	(ABCDEFG)	(ABCDEFG)
1	2		disturbed	BH1-4P
2	4		undisturbed	BH1-N
3	6		test	testing sample

← Previous → Next ✖ Cancel

Next, we will assign each column of the table a column of the imported data. Individual data of the column can be multiplied using any coefficient. This is important for example when changing units or sign.

In section (6) we can view the result of the import. Sample type “test” does not exist. The program therefore tried to find the closest option of the enumeration – in this case “technological”. The type can always be changed after the import, or even add a new option into the enumeration.

When we are satisfied with the result, we can confirm the import by pressing “OK”.

Import — □ ×

— Help

- part No. (4): see the input file split into columns
- part No. (5): modify the assignment to columns that data will be transmitted to, and enter the multiplier, unit and other parameters
- part No. (6): see the data that will be passed to the program

— (4) Input file split into columns

A (123)	B (123)	C (123,45)	D (ABCDEFGF)	E (ABCDEFGF)
1	2		disturbed	BH1-4P
2	4		undisturbed	BH1-N
3	6		test	testing sample

— (5) Assign columns to imported data

Depth from d_{min} [m]	Depth to d_{max} [m]	Sample type	Sample index
Column : B	(unspecified)	Column : D	Column : E
1,000E+00		Assignment	
m			

— (6) Result of import preview

Depth from d_{min} [m]	Sample type	Sample index
2,00	disturbed	BH1-4P
4,00	undisturbed	BH1-N
6,00	technological	testing sample

← Previous
✓ OK
✗ Cancel

The loaded data is displayed in the table. When importing, the program does not overwrite or delete the original data – the imported rows are loaded after the existing data. In our case we need to delete sample “aa”.

Test parameters

Test name: BH1

Coordinate : x = 1045318,41 [m] y = 747493,73 [m]

Height : input z = 336,15 [m]

Depth of 1. point : d₁ = 0,00 [m]

Overall depth : d_{tot} = 6,70 [m]

Field test generates soil profile

Layers Samples Table GWT Data - Protocol Data - Test Attachments

No.▲	Depth from d _{min} [m]	Depth to d _{max} [m]	Sample type	Sample index
1	2,00		disturbed	aa
2	2,00		disturbed	BH1-4P
3	4,00		undisturbed	BH1-N
4	6,00		technological	testing sample

Soil profile

Depth [m]

0,00
0,35
0,70
1,05
1,40
1,75
2,10
2,45
2,80
3,15
3,50
3,85
4,20
4,55
4,90
5,25
5,60
5,95
6,30
6,95

Made
Sandstone
Sandstone
Siltstone
Siltstone
Claystone
Siltstone
Claystone
Siltstone
Claystone
Siltstone
Siltstone
Sandstone

Print log Import OK + ↑ OK + ↓ OK Cancel

The import and edit of samples is now finished.

Test parameters

Test name: BH1

Coordinate : x = 1045318,41 [m] y = 747493,73 [m]

Height : input z = 336,15 [m]

Depth of 1. point : d₁ = 0,00 [m]

Overall depth : d_{tot} = 6,70 [m]

Field test generates soil profile

Layers Samples Table GWT Data - Protocol Data - Test Attachments

No.▲	Depth from d _{min} [m]	Depth to d _{max} [m]	Sample type	Sample index
1	2,00		disturbed	BH1-4P
2	4,00		undisturbed	BH1-N
3	6,00		technological	testing sample

Soil profile

Depth [m]

0,00
0,35
0,70
1,05
1,40
1,75
2,10
2,45
2,80
3,15
3,50
3,85
4,20
4,55
4,90
5,25
5,60
5,95
6,30
6,95

Made
Sandstone
Sandstone
Siltstone
Siltstone
Claystone
Siltstone
Claystone
Siltstone
Claystone
Siltstone
Siltstone
Sandstone

Print log Import OK + ↑ OK + ↓ OK Cancel