

NEXT

A Schlumberger Company

Petrel Geophysics Module 5: Condition input data for seismic well tie



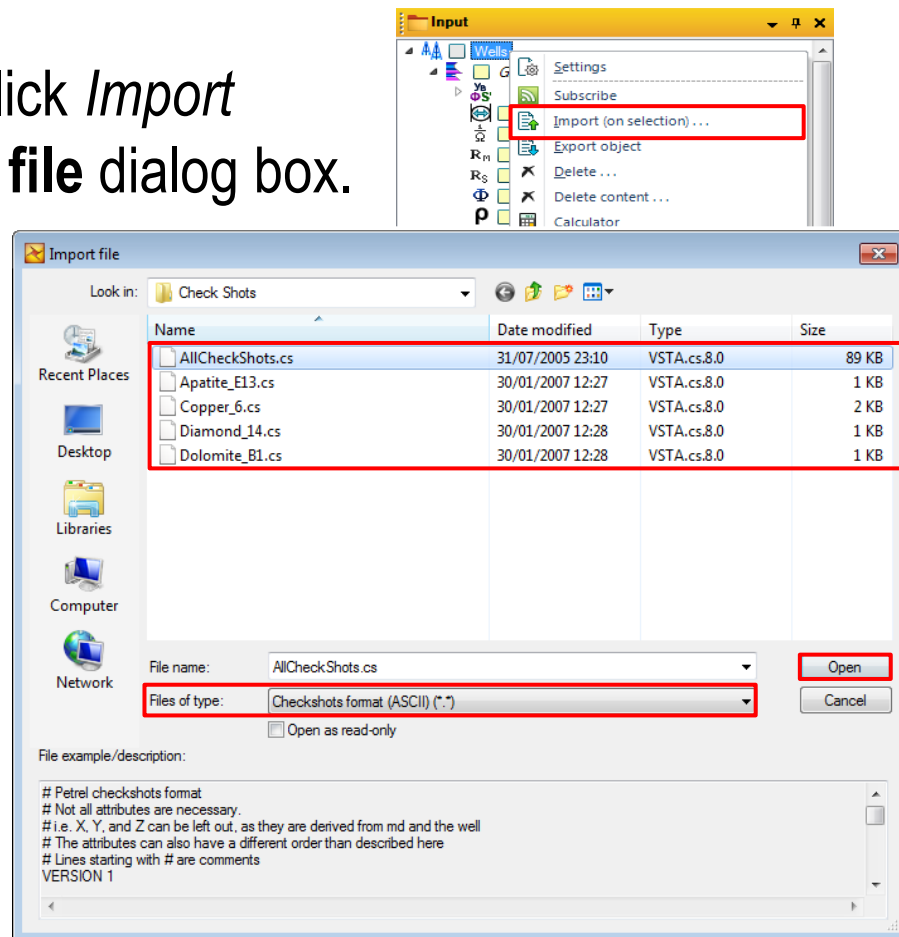
Schlumberger-Private

Lesson 1: Checkshot data loading



Load checkshot data (1)

1. Right-click the **Wells** folder and click *Import (on selection)* to open the **Import file** dialog box.
2. Set Files of type to *Checkshots format (ASCII) (*.*)*.
3. Select one or more files to import and click *Open*.



Load checkshot data (2)

- From the header info in the lower section of the dialog box, insert the parameters into the spreadsheet at the top of the dialog box.
- If the Well name is not included in the input checkshot file, assign and verify *Connect to trace* to the correct well.

The screenshot shows the 'Import checkshots: AllCheckShots.cs' dialog box. It contains a spreadsheet at the top for mapping attributes, and various configuration options below. Numbered annotations point to specific areas:

- 4**: Points to the spreadsheet header area.
- 5**: Points to the 'Z from MSL' field.
- 6**: Points to the 'Negate time values' checkbox.
- 7**: Points to the 'OK' button.

Column #	1	2	3	4	5	6
Attribute	X	Y	Z	TWT Picked	MD	Well
Attribute name	X	Y	Z	TWT Picked	MD	Well
Attribute type	Continuous	Continuous	Continuous	Continuous	Continuous	Text
Unit	File CRS u	File CRS u	feet	millisecond	feet	

Connect to trace: Well name: AllCheckShots.cs Undefined value: -999

Depth
Depth datum: KB
☐ Negate Z values
Time
Time datum: SRD
☒ Negate time values

Date
☒ Default
☐ Custom date format
12/29/1977
Time Zone: DST enabled: ☐

Header info (first 30 lines):
Line 1: # Petrel CheckShots format
Line 2: VERSION 1
Line 3: BEGIN HEADER
Line 4: X

OK Cancel

Load checkshot data (3)

6. Select time and depth datum.

7. Click *OK* to complete the checkshot data loading.

The screenshot shows the 'Import checkshots: AllCheckShots.cs' dialog box. It contains several sections with fields and buttons. Numbered annotations are placed as follows:

- 4**: Points to the 'Well name' field, which contains 'AllCheckShots.cs'.
- 5**: Points to the 'Z from MSL' field, which contains '0'.
- 6**: Points to the 'Time datum' dropdown menu, which is set to 'SRD'.
- 7**: Points to the 'OK' button at the bottom right.

The dialog box also includes a table for column mapping, a 'Depth' section with 'Depth datum' set to 'KB', a 'Time' section with 'Time datum' set to 'SRD', and a 'Header info' section showing the first 30 lines of the data file.

Column #	1	2	3	4	5	6
Attribute	X	Y	Z	TWT Picked	MD	Well
Attribute name	X	Y	Z	TWT Picked	MD	Well
Attribute type	Continuous	Continuous	Continuous	Continuous	Continuous	Text
Unit	File CRS u	File CRS u	feet	millisecond	feet	

Depth datum: KB
Negate Z values: ☐
Time datum: SRD
Negate time values: ☒
Z from MSL: 0 ft
Z from MSL: 0 ft
TWT from SRD: 0 ms
Replacement velocity: ☐ ft/s
Date: Default
Custom date format: -- -- --
Time Zone: ☐ DST enabled
Header info (first 30 lines):
Line 1: # Petrel CheckShots format
Line 2: VERSION 1
Line 3: BEGIN HEADER
Line 4: X

Load checkshots: Errors

Checkshot data is imported incorrectly when the input file contains positive time values. Change the column to TWT and check *Negate time values*.

X-Coord	Y-Coord	Z	TWT	MD
1599743.87	-172747.82	0.00	0.00	95.00
1599743.09	-172748.18	-100.00	39.71	195.01
1599743.02	-172748.21	-105.00	41.70	200.01
1599738.12	-172747.07	-304.90	119.30	399.98
1599732.30	-172747.23	-704.80	268.00	799.9
etc				

TWT must be negative!

Wrong!

Column #	1	2	3	4	5	6
Attribute	X	Y	Z	TWT Picked	MD	Well
Attribute name	X	Y	Z	TWT Picked	MD	Well
Attribute type	Continuous	Continuous	Continuous	Continuous	Continuous	Text
Unit	File CRS u	File CRS u	feet	millisecond	feet	

☐ Connect to trace: Number of header lines: 2

☒ Well name: Apatite_E13neg.cs Undefined value: -999

Depth

Depth datum: KB Z from MSL: ft

☐ Negate Z values

Time

Time datum: SRD Z from MSL: 0 ft

☐ Negate time values TWT from SRD: 0 ms

☐ Replacement velocity: t/s

Correct!

Column #	1	2	3	4	5	6
Attribute	X	Y	Z	TWT	MD	Well
Attribute name	X	Y	Z	TWT	MD	Well
Attribute type	Continuous	Continuous	Continuous	Continuous	Continuous	Text
Unit	File CRS u	File CRS u	feet	millisecond	feet	

☐ Connect to trace: Number of header lines: 2

☒ Well name: Apatite_E13neg.cs Undefined value: -999

Depth

Depth datum: KB Z from MSL: ft

☐ Negate Z values

Time

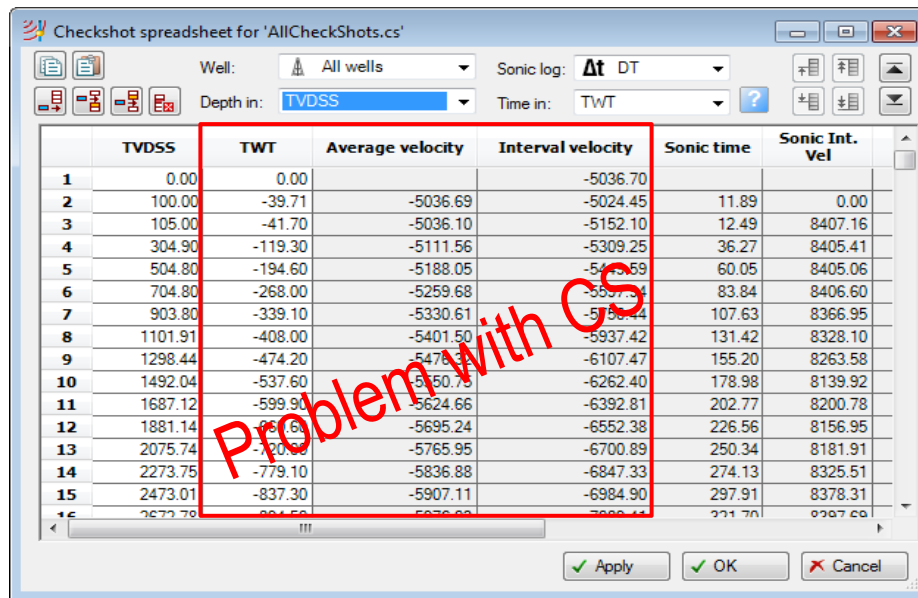
Time datum: SRD Z from MSL: 0 ft

☒ Negate time values TWT from SRD: 0 ms

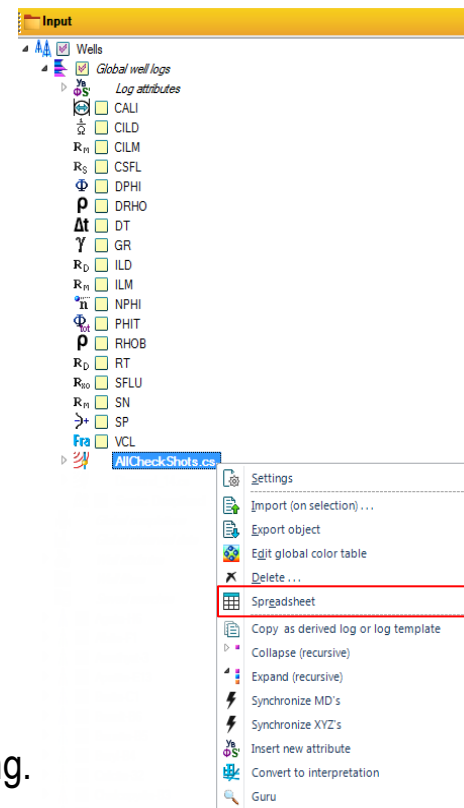
☐ Replacement velocity: t/s

QC checkshots (1)

1. Right-click checkshots in the **Global well logs** folder and open the spreadsheet.
2. Check for negative velocities and TWT.



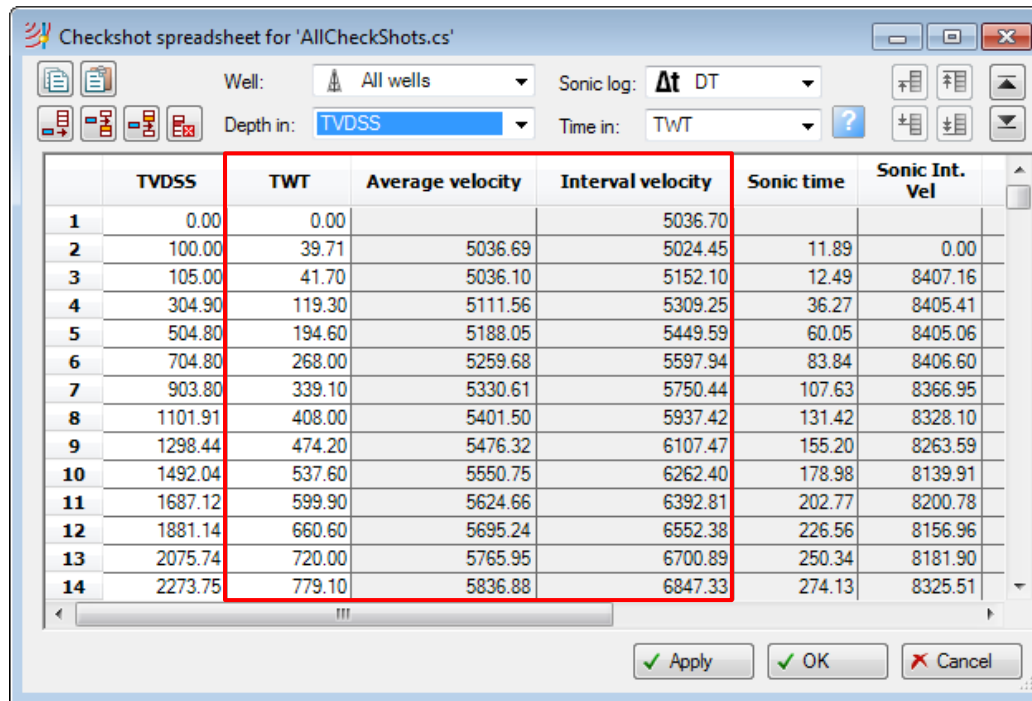
	TVDSS	TWT	Average velocity	Interval velocity	Sonic time	Sonic Int. Vel
1	0.00	0.00		-5036.70		
2	100.00	-39.71	-5036.69	-5024.45	11.89	0.00
3	105.00	-41.70	-5036.10	-5152.10	12.49	8407.16
4	304.90	-119.30	-5111.56	-5309.25	36.27	8405.41
5	504.80	-194.60	-5188.05	-5475.69	60.05	8405.06
6	704.80	-268.00	-5259.68	-5897.74	83.84	8406.60
7	903.80	-339.10	-5330.61	-5736.44	107.63	8366.95
8	1101.91	-408.00	-5401.50	-5937.42	131.42	8328.10
9	1298.44	-474.20	-5476.33	-6107.47	155.20	8263.58
10	1492.04	-537.60	-5550.75	-6262.40	178.98	8139.92
11	1687.12	-599.90	-5624.66	-6392.81	202.77	8200.78
12	1881.14	-656.60	-5695.24	-6552.38	226.56	8156.95
13	2075.74	-706.60	-5765.95	-6700.89	250.34	8181.91
14	2273.75	-779.10	-5836.88	-6847.33	274.13	8325.51
15	2473.01	-837.30	-5907.11	-6984.90	297.91	8378.31
16	2672.78	-894.50	-5976.88	-7088.45	321.70	8327.69



NOTE: It is important to always QC the loaded data. In this example, negative time and velocity values reflect errors in the checkshot loading.

QC checkshots

Correctly loaded checkshot survey parameters – TWT, TVDSS, and velocities – are positive numbers.



Checkshot spreadsheet for 'AllCheckShots.cs'

Well: All wells Sonic log: Δt DT

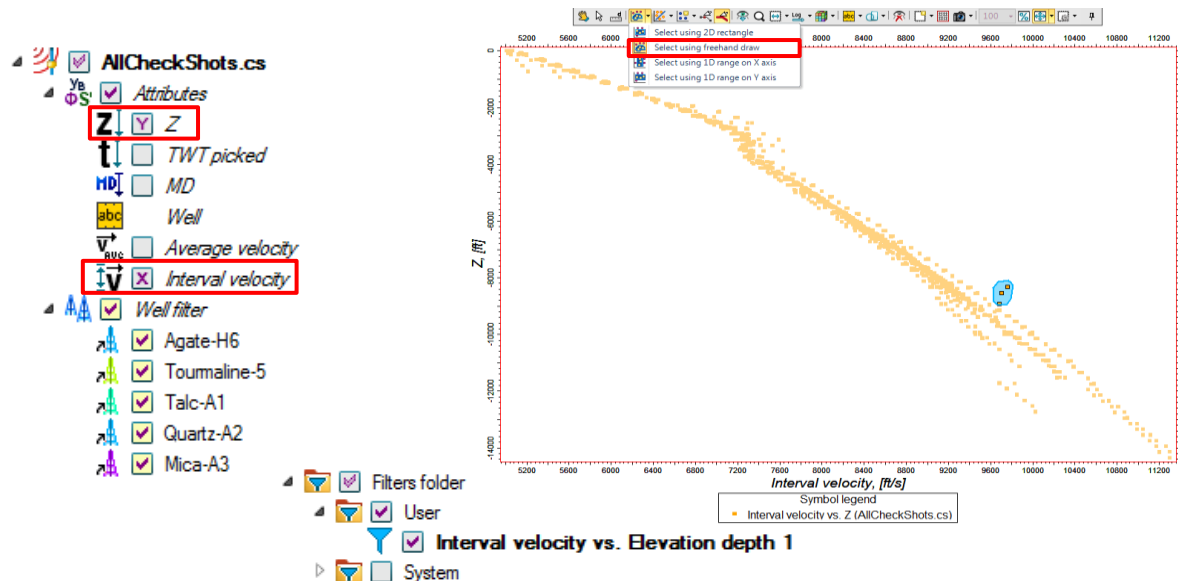
Depth in: TVDSS Time in: TWT

	TVDSS	TWT	Average velocity	Interval velocity	Sonic time	Sonic Int. Vel
1	0.00	0.00		5036.70		
2	100.00	39.71	5036.69	5024.45	11.89	0.00
3	105.00	41.70	5036.10	5152.10	12.49	8407.16
4	304.90	119.30	5111.56	5309.25	36.27	8405.41
5	504.80	194.60	5188.05	5449.59	60.05	8405.06
6	704.80	268.00	5259.68	5597.94	83.84	8406.60
7	903.80	339.10	5330.61	5750.44	107.63	8366.95
8	1101.91	408.00	5401.50	5937.42	131.42	8328.10
9	1298.44	474.20	5476.32	6107.47	155.20	8263.59
10	1492.04	537.60	5550.75	6262.40	178.98	8139.91
11	1687.12	599.90	5624.66	6392.81	202.77	8200.78
12	1881.14	660.60	5695.24	6552.38	226.56	8156.96
13	2075.74	720.00	5765.95	6700.89	250.34	8181.90
14	2273.75	779.10	5836.88	6847.33	274.13	8325.51

Apply OK Cancel

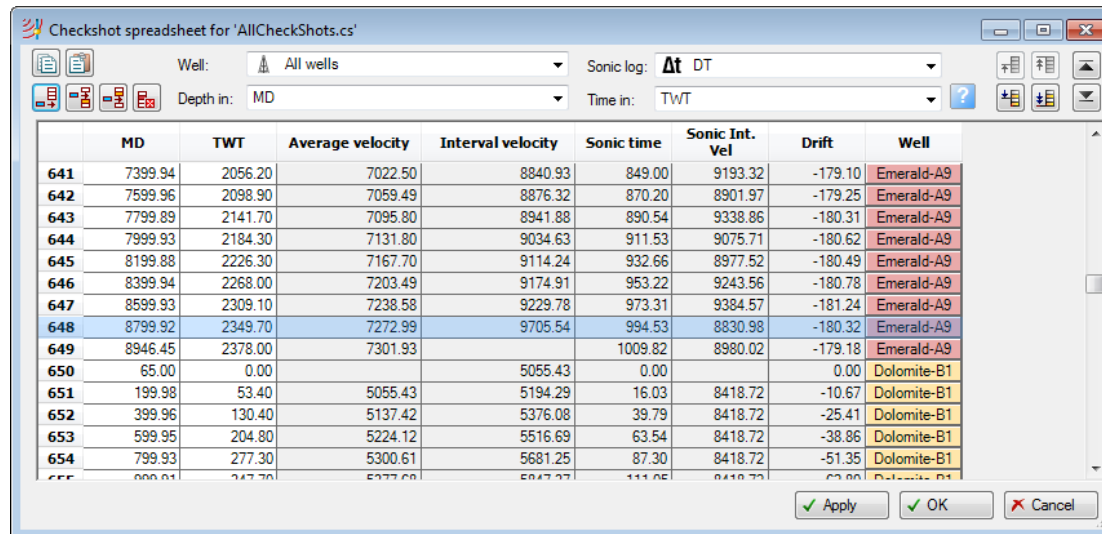
Edit checkshot data (1)

1. In a **Function** window, display the Interval velocity attribute of checkshots against Z (or TWT). Use a well filter to display individual checkshot surveys.
2. Use one of the filter icons from the **Window** toolbar and select the outliers. The automatically created filter is stored in **Filters** folder in the **Input** pane.



Edit checkshot data (2)

3. Click the *Select using freehand draw* icon and paint a closed area in the **Function** window. Make sure that the filter polygon contains some bad points.
4. In the Checkshots spreadsheet, click the *Delete selected row(s) in the table* icon to remove the rows, then click *Apply* to make the change in the checkshot data.
5. Check the other wells for outliers.

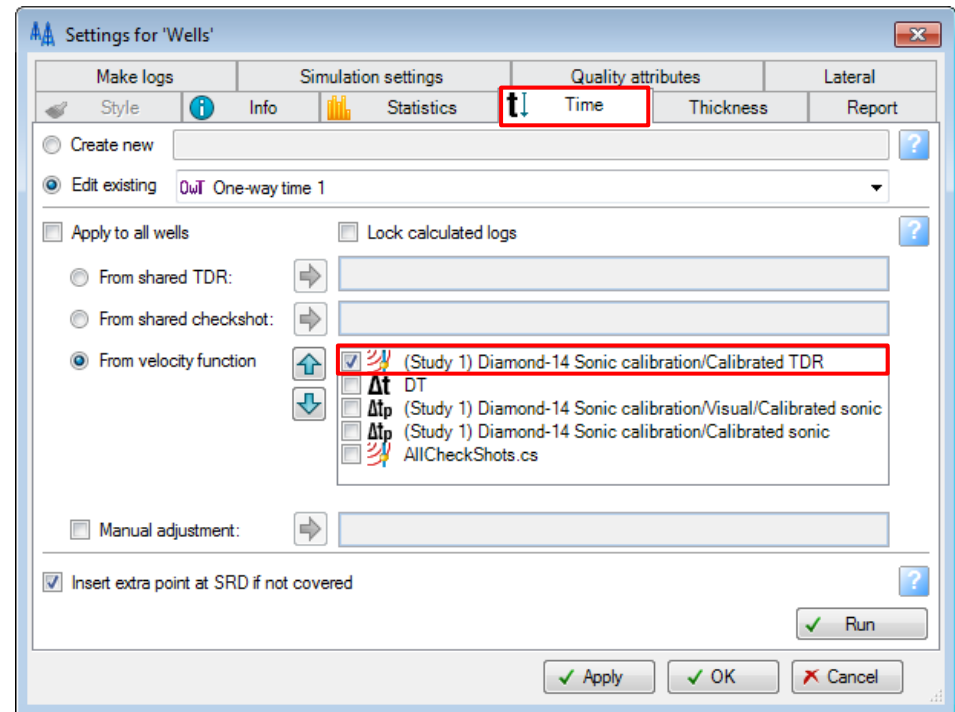


	MD	TWT	Average velocity	Interval velocity	Sonic time	Sonic Int. Vel	Drift	Well
641	7399.94	2056.20	7022.50	8840.93	849.00	9193.32	-179.10	Emerald-A9
642	7599.96	2098.90	7059.49	8876.32	870.20	8901.97	-179.25	Emerald-A9
643	7799.89	2141.70	7095.80	8941.88	890.54	9338.86	-180.31	Emerald-A9
644	7999.93	2184.30	7131.80	9034.63	911.53	9075.71	-180.62	Emerald-A9
645	8199.88	2226.30	7167.70	9114.24	932.66	8977.52	-180.49	Emerald-A9
646	8399.94	2268.00	7203.49	9174.91	953.22	9243.56	-180.78	Emerald-A9
647	8599.93	2309.10	7238.58	9229.78	973.31	9384.57	-181.24	Emerald-A9
648	8799.92	2349.70	7272.99	9705.54	994.53	8830.98	-180.32	Emerald-A9
649	8946.45	2378.00	7301.93		1009.82	8980.02	-179.18	Emerald-A9
650	65.00	0.00		5055.43	0.00		0.00	Dolomite-B1
651	199.98	53.40	5055.43	5194.29	16.03	8418.72	-10.67	Dolomite-B1
652	399.96	130.40	5137.42	5376.08	39.79	8418.72	-25.41	Dolomite-B1
653	599.95	204.80	5224.12	5516.69	63.54	8418.72	-38.86	Dolomite-B1
654	799.93	277.30	5300.61	5681.25	87.30	8418.72	-51.35	Dolomite-B1
655	999.91	347.30	5377.60	5847.27	111.05	8418.72	-63.86	Dolomite-B1

Time-depth relationships

The **Time** tab in the *Wells* folder **Settings** dialog box contains a list of available sources for the time-depth relationship for all wells.

If you select more than one object, the list is used in a hierarchical order.



Exercises