# WellQC Release 4.4



Geological & Geophysical Data Quality Control

User Guide

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## Introduction

The *WellQC* application is designed for operation with geological and geophysical data and enables one to perform timely checks for completeness of the provided material and compliance of the data to the international and local standards, as well as to eliminate the encountered errors automatically.

### Checks

The following **checks of the materials** are implemented in the software:

By Field:	By Place of Usage:
<ul> <li>Project of geological studies</li> <li>Drilling</li> <li>Directional survey</li> <li>Well history</li> <li>Verifications of geological parameters</li> <li>Geophysical well-logging</li> <li>Reserves estimation</li> <li>Planned well stock</li> <li>Curves linking</li> <li>Geotechnical well testing</li> <li>Core</li> <li>Bottom-hole formation zone</li> <li>Formation hydraulic fracturing</li> </ul>	<ul> <li>Well testing and diagnostic testing laboratories</li> <li>Compressor/Booster pump stations</li> <li>Chemical analysis laboratories</li> <li>Electric centrifugal pump unit</li> <li>Sucker rod pumping unit</li> <li>Workover/Well Service</li> <li>Oil and gas production units</li> </ul>

The checks in the application are divided into the following categories:

- Completeness of the provided material;
- Data format and structure maintenance control;
- Check of syntactical correctness of incoming data;
- Analysis of the checked data and its comparison to the reference data;
- Check of the incoming material in the context of Databank filling.

### Transformations

Transformation shall mean an automatic elimination of a previously encountered error.

The categories of transformations are distributed as follows:

- Correction of the whole material according to the pre-set structural units, such as determination of identity of a well, field, UWI, etc.;
- Conversion of well-logging data according to the storage standards;



- Syntactical and notional correction of the data internal structure;
- Conversion of files to required formats;
- Exclusion of files and directories as per pre-set conditions;
- Duplicate data removal;
- Correction of the material, based on the values in the database.

### File Formats

The application supports the following data formats:

- Log ASCII Standard, version 1.2, 2.0, 3.0 .*las* 1.2<sup>1</sup>, 2.0<sup>2</sup>, 3.0<sup>3</sup>;
- Inter-layer related information .zak;
- Table datatypes .*xls/xslx, .db/dbf;*
- Text files with pre-defined structure.

<sup>&</sup>lt;sup>1</sup> <u>https://www.cwls.org/wp-content/uploads/2014/09/LAS12\_Standards.txt</u>

<sup>&</sup>lt;sup>2</sup> https://www.cwls.org/wp-content/uploads/2017/02/Las2\_Update\_Feb2017.pdf

<sup>&</sup>lt;sup>3</sup> https://www.cwls.org/wp-content/uploads/2014/09/LAS 3 File Structure.pdf

<sup>©</sup> Geoleader



## Functionality

## Top Panel

In the top part of the window there is always the name of the application, its release, and standard window control buttons – «Minimize/Restore», «Close».

Main menu Control panel	
WellQC 4.4b46	• • •
Checkset PGI	
Transformations x Text editor x Table editor x Errors x	Empty data list
	File catalog

• Main Menu

Main functionality of the application

• Control Panel

The most frequently used actions are placed as pictogram buttons. The Control Panel is designed to operate the input data.

- File Catalog It displays a tree-like structure of the chosen material.
- Data Window



Depending on the chosen tab, it serves for displaying encountered errors, a list of transformations, for editing the text, or table files.

The interface may be customized for each user. All the panels and tabs may be moved. The tabs are not compulsory.

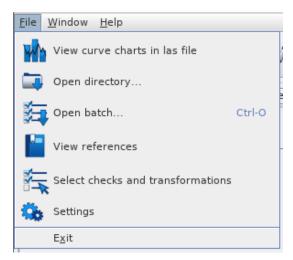


## Main Menu

A quick access to the main functionality of the application.

File

The «File» tab contains the following commands:



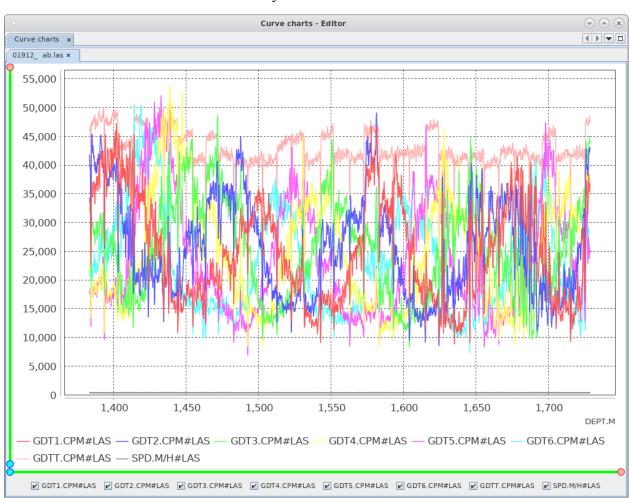
View Curve Charts in las-file

Opens a window for selecting a *las*-file to be viewed. After selecting the file a window for selecting the curves to be displayed is opened.

• (x
✓ Select\deselect all
- 01912_ ab.las
GDT1.CPM
GDT2.CPM
GDT3.CPM
GDT4.CPM
GDT5.CPM
GDT6.CPM
GDTT.CPM
SPD.M/H
·
Show charts Cancel

After selection the chosen curves are shown in a separate tab «Curves display»:





### See more details about the tab functionality in the «Curves Charts» section.

### Open Directory

•	Select directories	×
Look <u>I</u> n: 📑 pgi	▼ A	
01112022	<b>293_1</b>	<b>66</b> 5
017	<u> </u>	<b>[]</b> 848
017_1	<b>3</b> 17	<b>[]</b> 89:
<b>057</b>	<b>—</b> 331	📑 aut
<b>108</b>	📑 337_test	📑 der
20170718	609	📑 pgi
293	665	📑 rep
•		Þ
Folder <u>n</u> ame: /ho	me/esolovyova/Documents/Testdata/pgi	
Files of <u>Type</u> : All	Files	•
	Open directory	Cancel



Opens a window for selecting a single, or several directories with the materials to be viewed. The structure shall be displayed in the «File catalog» tab.

### Open Batch

Opens a window for selecting a batch file of *WellQC* settings in the *.wbi* format (it contains the information regarding check configurations).

### View References

• References 📀 🔗	
Name	Description
CATEGORY	Category reference
CDNG_DNSKNS_REF	BPS/SPS facilities
COLOR_MARK	Marker color reference
D_NKT	Reference of tubing diameters
ENTERP	Reference of companies
FIELDS	Reference code of fields
FOND	List of wells
MARK_TYPE	Marker types reference
MEAS_AIM	Measurement aim reference
MEAS_PLC	Reference of places of measurement
METHODPR	Well survey methods reference
PLAST	Layers Codes Reference
PRESS_TP	Pressure Determination reference
PR_FOND	Project fund
PUMP	Borehole pump characteristics refere
PUNCHER	Reference types of drills
PlastFld	Reference of geological tie of layers t
SHOP	Shop code reference
SPR_TD	
S_CIR	Reference of Research Objectives in
S_CPR	Perforation target
S_DK	Production casing (pipe) diameters re
S_EIZ	Reference Units
S_GOST	
S_GP1	Reference of geophysical instruments
S_GTM	Reference of geological and technical
S_GZ	Reference of geophysical probes
s_III	Ionizing Radiation Sources reference
s_kgk	Geophysical Curve Codes Reference
S_KKP	Layer lithology reference
S KS	This is dictionary 'S KS'

Opens a window for selecting a reference to be viewed from a list. To open a reference double click on it with the mouse, or click on it, then push the «View» button.

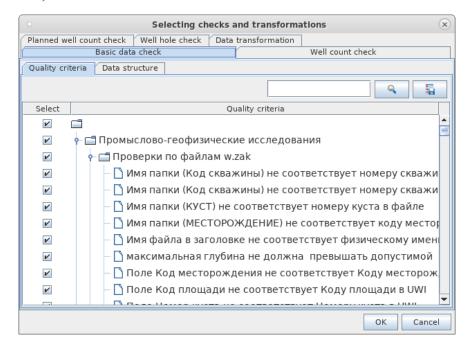


ОД_ПЕРФОРАТОРА ТИП_ПЕРФОРАТОРА	ОПИСАНИЕ
ПКТ-102 КЛМ	Кумулятивный корпусной, о 🔺
ПКТ-114 КЛ	Кумулятивный корпусной, о ≡
3 3/8"Prospector, 6 spf	Кумулятивный корпусной о
3 3/8"Prospector, 8spf	Кумулятивный корпусной о
4"JRS,4 spf	Кумулятивный корпусной о
JRC 1 9/16'	Корпусной, однократного и
КПОЗ6	Кумулятивный корпусной, о
ПКН64 ВЕКТОР	Кумулятивный корпусной, м
NKH73 BEKTOP	Кумулятивный корпусной, м
ПКН89 ВЕКТОР	Кумулятивный корпусной, м
NKH102 BEKTOP	Кумулятивный корпусной, м
ПКО 102-010 ПС	Кумулятивный корпусной с
TKO-89DN	Кумулятивный корпусной, о
ПКО-89DN-01	Кумулятивный корпусной, о
NKO-102DN	Кумулятивный корпусной, о
ПКТ-73	Кумулятивный корпусной, о 🔻

For more convenient search of the reference information Search by value should be used by means of setting a Filter in the required column.

### Select Checks and Transformations

By means of this functionality one may select documents, for which the check and data correction procedures shall be performed, as well as to select certain checks and transformations for performance of these procedures. For more convenient use search by name of Quality criteria, or by Transformation, is available.





There is also an opportunity to create an xlsx-report with a list of all the checks and corrections for the stated checksset.

### Settings

0	Settings	$\otimes$
General options		
Copy data in working d	irectory	
Encoding selection		
Encoding CP866		-
TextEditor		
Line separator Linux		
🖌 Syst	em values	
Export to excel		
xlsx template		default_en
Research cell	C1	
Date cell	C3	
Errors cell	A8	
		OK Cancel

The window serves for configuration of the general settings, applied throughout the whole lifecycle of the application. The following settings are available:

- Encoding selection for reading the material. By default, all the material is accepted in the encoding CP866;
- The option *«Copy data in working directory»* (The selected material is copied into the working directory of the user, which contributes to speeding up the processing);
- Setting a line separator for a text editor, depending on an operation system (it is necessary to select a line separator in order to display the edited files correctly. For example, while working in the *Linux* operation system, in order to display the saved files in *Windows* correctly the line separator *Windows* should be selected);
- Setting a template for export to *excel* (setting export of errors to an *Excel* file. By default, a standard template file *«default»* is used. The format of the *excel* cells: the column is set with a Latin letter, the row is set with a number).

### Exit

Finishes the operation and closes the application.

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### Window

<u>W</u> indow	<u>H</u> elp
Transfor	mations
Table ed	itor
Text edit	tor
File cata	log
File cata Curve ch Curve lir Errors tr	narts
Curve lir	nking errors
Errors tr	ee
Reset <u>W</u>	indows
Close W <u>i</u>	ndow
Close <u>A</u> ll	Documents
Close Ot	<u>h</u> er Documents
<u>D</u> ocumer	nts

Contains an access to the following components (See more details on them in the corresponding sections of the document):

- Transformations;
- Table Editor;
- Text Editor;
- File Catalog;
- Curve Charts;
- Curve Linking Errors;
- Errors Tree.

These names are an alternative for access to the main components of the application. During normal operation of the application the necessary tabs are accessed automatically through the corresponding actions by the user.

Window Control Block:

• Reset Windows

Reset all the windows to the pre-set view.

• Close Window

Closes the current tab in the Data Window.

### • Close All Documents

Closes all the tabs, opened in the Data Window.



### • Close Other Documents

Closes all the tabs, opened in the Data Window, except the current one.

• Documents...

O Documen	ts
Documents:	
Errors	Switch to Document
Table editor	
Text editor Transformations	C <u>l</u> ose Document(s)
Transformations	Save Documents(s)
	Order by
	) <u>n</u> ame
	○ recent usage
Description:	
This is an ErrorsTree window	
	Close



## Control Panel

With the main toolbar one may quickly perform one of the commands, also available in the main menu. With the mouse pointer on the button a tip pops up.



In the dropdown list all the checksets, which the application works with, are stated. For further operation one checkset should be selected.

Checkset:	Поверки ГП	•
6	Керн	•
Transfor	Коррозия	
	KPC/ПPC	
	Экология	
	лгди	=
	Дело скважины	
	Бурение+Инклинометрия	
	Поверки ГП	•

### **Compulsory Functionality**

## Edit Checkset

Allows to add, or configure a new checkset, with provided paths to the structure files, as well as to edit the existing checksets.

Edit current checkset		×
пги	-	Add
Бурение		
Инклинометрия		Edit
цднг		Remove
Нефть		
хал		Ok
пнп		
Гидраты		
уэцн		
ШГН		
MЭP		
Вода	=	
ГРП		
Керн		
Коррозия		
KPC/ПPC		
Экология		
лгди		
Дело скважины		
Бурение+Инклинометрия		
Поверки ГП		
инкл_пз		
гис_пз		
ЛГДИ исследование		
GRP исследование		
ГТИ		
Проектный Фонд	-	





Similar to Open Directory through the «File» tab.

## Check Uploaded Files

Start of data check in the uploaded directory. After the check is completed, a message appears in the lower right corner with a number of the found errors and warnings, as well as the time, required for the data check.

**Error** – indicates that the material is incorrect and requires correction;

**Warning** – indicates that there are uncertainties in the material.



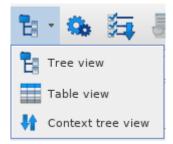
## View References

Similar to View References through the «File» tab.

Select Checks and Transformations

Similar, as through the «File» tab.





The errors and warnings, encountered during the check, will be automatically displayed in the «Errors» tab. Each error contains a textual representation, position in the file, path to the original file, and, in some cases, path to the reference.

The check result may be presented as:

• Catalog View – the found errors are presented in a tree view, which duplicates the structure of the directories in the «File Catalog» tab. Due to a rigid structure the data sorting is impossible.



Errors - Editor	$\odot$ $\odot$
Errors x	
	Font size 14 💌
Error	Position
🗂 pgi	
• 🗂 017	
🕈 🗂 017n	
• □ 16012Γ	
14012016	
🕘 Not match	
• 📑 transformed_2022-06-28_19-10-37	
• □ 16012Γ	
14012016	
🖉 Not match	
• 📑 transformed_2022-06-28_19-10-33	
- 🗂 15131_	
🖉 Not match	
ዮ 📑 14012016	
e 📑 16012_e.zak	
— 😣 Имя папки (МЕСТОРОЖДЕНИЕ) не соответствует коду месторождения в файле	
😣 Имя папки (Код скважины) не соответствует номеру скважины в файле 6	
<ul> <li>         Ø Missing directory Control     </li> </ul>	
e 📑 16012_gp.zak	
Impossible to check constraint(s) because of different count of rows for tables: gp_z	
— 🛞 Имя папки (МЕСТОРОЖДЕНИЕ) не соответствует коду месторождения в файле 4	
🛞 Имя папки (Код скважины) не соответствует номеру скважины в файле 6	
🕈 📑 16012_z.zak	
— 🛞 Маска для поля DB не соответствует формату xxxx.x или отсутствует	
— 🛞 Маска для поля DBN не соответствует формату xxxx.x или отсутствует	
- M Маска для поля В2В не соответствует формату уууу у или отсутствует	

- *Table View* the found errors are presented in a table view, which enables one to sort the data by:
  - filename;
  - $\circ$  text of the error;
  - $\circ$  error position in the file.

•	Errors - Editor	$\odot$
Errors ×		
🗟 📰 🔄 🖥	Total: 326 File filter	
Data	Error	Position 👻
😢 15131_z.zak	Field RS2R has incorrect format	12
😢 15131_z.zak	Field RS2R has incorrect format=x.x xx	12
😢 15131_z.zak	Field RS2R doesn't complete	12
😢 15131_z.zak	Field COMMENT has incorrect formatLength 100 is correctField length 97	12
😢 16012_z.zak	Symbol'.' has incorrect position - DB	12
😢 16012_z.zak	Field DB has incorrect format=xxx.x	12
😢 16012_z.zak	Field DB doesn't complete	12
😢 16012_z.zak	Field DBN has incorrect format	12
😣 16012_z.zak	Field DBN has incorrect format=xx.x x	12
😣 16012_z.zak	Field DBN doesn't complete	12
😣 16012_z.zak	Field RS has incorrect format	12
😢 16012_z.zak	Field RS has incorrect format=xx.x x	12
8 16012_z.zak	Field RS doesn't complete	12
😢 16012_z.zak	Field KPROD has incorrect format	12
😢 16012_z.zak	Field KPROD has incorrect format=.xxx x	12
🛞 16012_z.zak	Field KPROD doesn't complete	12
😢 16012_z.zak	Field OBV has incorrect format	12
🛞 16012_z.zak	Field OBV doesn't complete	12
😣 16012_z.zak	Field DV has incorrect format	12
😢 16012_z.zak	Field DV has incorrect format=x.x x	12
😢 16012_z.zak	Field DV doesn't complete	12
8 16012_z.zak	Field DZT has incorrect format	12
😣 16012_z.zak	Field DZT has incorrect format=x.x x	12
😣 16012_z.zak	Field DZT doesn't complete	12
8 16012_z.zak	Field DN has incorrect format	12
8 16012_z.zak	Field DN has incorrect format=x.x x	12
8 16012_z.zak	Field DN doesn't complete	12
😧 16012 z zak	Field DZV has incorrect format	12



• Context Tree View – the found errors are presented in a tree view, which duplicates the structure of the directories in the «File Catalog» tab, but with the provided structure it is possible to group the errors by the encountered fields. For example, by UWI, identification number of the field, cluster, wellbore, contractor, etc.

	Errors - Editor		$\odot$
Errors ×			
	Font size 14 🗸 Group data by	field UWI	•
Eri	ror	Positic	on
pgi			
<ul> <li>UWI: 255848017H15131_</li> </ul>			
🕈 🗊 15131_n.tab			
— 😣 Имя папки (МЕСТОРОЖДЕНИЕ) не соот	ветствует коду месторождения в файле	3	
🕈 🗐 15131_ab.las			
<ul> <li>Old format of las-file</li> </ul>			
— 🛞 Имя папки (МЕСТОРОЖДЕНИЕ) не соот	ветствует коду месторождения в файле	11	
🗆 🙁 дата каротажа должна попадать в ин	тервал (дата поверки прибора, дата поверки пр	v19	
e 🔝 15131_aa.las			
<ul> <li>Old format of las-file</li> </ul>			
🛛 🛞 Имя папки (МЕСТОРОЖДЕНИЕ) не соот	ветствует коду месторождения в файле	11	
e 🗐 15131_ab.las			
<ul> <li>Old format of las-file</li> </ul>			
— 🛞 Имя папки (МЕСТОРОЖДЕНИЕ) не соот	ветствует коду месторождения в файле	11	
🛛 🛞 дата каротажа должна попадать в ин	тервал (дата поверки прибора, дата поверки пр	¥19	
- 🗐 15131_h.zak			
🛛 🛞 Имя папки (МЕСТОРОЖДЕНИЕ) не соот	ветствует коду месторождения в файле	4	
- 🗐 15131_z.zak			
<ul> <li>Symbol'.' has incorrect position - DB</li> </ul>		12	
<ul> <li>Bield DB has incorrect format=xxx.x</li> </ul>		12	
<ul> <li>B Field DB doesn't complete</li> </ul>		12	
<ul> <li>— Sield DBN has incorrect format</li> </ul>		12	
─		12	
<ul> <li>Field DBN doesn't complete</li> </ul>		12	
<ul> <li>— Sield RS has incorrect format</li> </ul>		12	
─		12	
<ul> <li>Field RS doesn't complete</li> </ul>		12	
Field KPROD has incorrect format		12	



Similar to the «File» tab.



Similar to the «File» menu item.



View of the curve charts in the PVLog Viewer browser application from the File Catalog.

The *PV Log Viewer* application is designed in order to view the data of geophysical well-logging results in a graphical form, with corresponding setting of the configuration file (See the Administration and Configuration Guide). Before running *PV Log Viewer*, the files to be viewed shall be selected in the catalog.

The following file formats are supported:

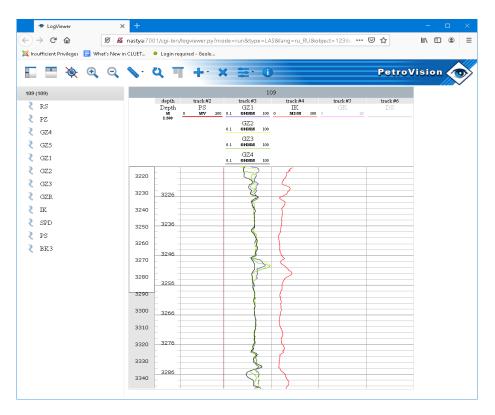
- .*las* (1.2, 2.0, 3.0);
- .*lis*, .*dlis*;

```
© Geoleader
```





- .witsml;
- Information regarding interlayers etc. (*.zak* and its sub-types *g*, *m*, *i*, *ir*, *in*);
- Information regarding perforation and lithological layers (*.zak* and its sub-types *h*, *gp*).



This method provides more options for curves display, than viewing with the application itself (the «Curve Charts» tab), as there are the following opportunities:

- Split and comparative operation with several files;
- Color and type setting of visual interpretation;
- View of the lithological and perforation data;
- Labeling of the layers of interest;
- Saving the information and settings for the user.

### Variable functionality

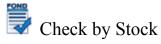
Besides the compulsory icons, there are variable ones. Their presence, or absence, depends on existence of a file of a certain structure among the files of checks:



## Data Transformation

Run transformations of the uploaded directory. See more details in the «Transformations» section.

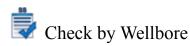




Run check by well stock in the data of the uploaded directory.



Run check by planned well stock in the data of the uploaded directory.



Run check by wellbore in the data of the uploaded directory.

## E Checkset Parameters

Provides an access to editing the parameters for the selected checkset.

For example, a value, which is set by the user and has an impact on the progress of performing the check of the input material.

For example, for the check, which determines a relation between a value from the input file and the set interval, the limits of the intervals may be parameterized and vary, depending on the user's preferences.

# Selection of Fields for Compulsory Fill-in

During performance of the material quality control procedure, the application shall on a mandatory basis check for the presence of values in key fields (compulsory to be filled in).

This function provides an access to a window for selecting the fields in the input files compulsory to be filled in.

Currently, editing for the .*dbf* format is only available.



### Main Tabs of Data Panel

They appear during loading of the application and are not compulsory ones, as any other. They may be called in the Main Menu through the «Window» tab, or when running the functionality, corresponding to them.

### File Catalog

It is a tree, made of structures of the selected directories, sub-directories, and files.

Besides the tree of objects, the File Catalog contains a toolbar, which

displays a number of files and enables one to Collect Statistics  $\checkmark$  - information regarding presence and number of files, sorted by extensions.

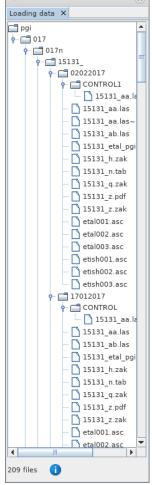
When a file from the tree is selected, the Context Menu may be called:

• Open in Editor

The file is opened in the Table Editor tab, if this is a table document, or in the Text Editor tab. Here the file may be edited (the errors may be corrected) and saved in the corrected form.

• Open in Viewer

The file is opened in the tab for viewing files. In this case, several files may be opened at once. They will appear as tabs with the names of the documents.



### Errors

The tab is designed to view errors and warnings, found during operation. The operation is displayed as a table, or a structure tree of error objects.

**Error** – indicates that the material is incorrect and requires correction;

**Warning** – indicates that there are uncertainties in the material.

For more convenient interaction the functionality, presented as the following buttons, is implemented:





### Open File in Editor

When an error is selected (if it belongs to a certain file), transfer to the text editor, or table editor is performed, depending on the file type. The similar behavior is observed after double click by mouse.



Open File with Third Party Application

Opens a document, selected among the errors, in the chosen application:

- Open File in Editor (for example, the Notepad application);
- Open File in Editor with Extended Functionality (for example, the Microsoft Word application).

Configuration of the editors is performed separately (See the Administration and Configuration Guide).

## **In Save Table Data to File**

Allows creating an xlsx-report on the basis of discrepancies and errors, found in the input material.

As well, a tool is provided, which enables one to select certain errors for padding the report.



### Show Only Errors

Enables one to leave only the errors themselves in the Errors tab and remove the warnings from the displayed list.

As well, with any type of presentation, there is an opportunity to set the required font size.

Regardless of the errors display type, the following may change:

- File filter sorting of the table by files;
- Grouping by field sorting of the errors tree by fields inside the file.

In general, the errors are grouped by files. The data regarding the errors contains the information about the error type and position in the document (line number).

### Text Editor

An opportunity to view and edit the file, opened in the editor. It enables one to correct the found errors in the file, without running any other applications, and run it again for checking.



For convenience of the user highlighting of the found inaccuracies is implemented in the component (red – an error, yellow – a warning). In the lower part of the window there is a list of errors and warnings, found in this file.

The tab provides the following functionality:

Open File Opens a window for selecting a file(s) from the file system.

Save File Saves the current changes to the file.

Save File As Provides a choice, under which name to save the document, opened in the editor.



Cancels the previous action with the data, whether it is a transfer of a line, or entering/removing a character.

Redo Changes Returns the changing action.

During operation with the file it is possible to freeze any line of the text. Freezing of a line is performed in the text editor with a double click of the left mouse button on the line number. In order to switch the frozen line to another one click on another line number.



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3528	1727.10	1.55000	1.60000	0.39000	7.68000		
3529	1727.20	1.54000	1.59000	0.38000	7.69000		
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### Table Editor

In this tab the files of the *dbf*, *xls*, *xlsx* formats may be viewed and edited.

For more convenient search within the document filtering by file columns is implemented in the table editor.

- Open File Save File Save File As The behavior is similar to the Text Editor tab
- Add Rows Adds a row below the highlighted one
- Add Columns
- Delete Selected Rows
- Vndo Delete

As well as in the Errors tab, the required font size may be set.



### Transformations

This tab is for viewing the changes, made during the procedure of automatic correction of the material. All the information is presented as a table, sorted by time.

The table includes the following columns:

- **Transformation Type** •
  - O successful;
  - 🗵 failed:
  - passed without changes.
- Data •

Name of a directory, or a document, which the transformation is applied to.

### • Operation Start Time

Date and time, including seconds, at which a certain transformation was started.

### • Transformation Name

Message regarding what was done.

#### Transformation Description •

Upon clicking the *icon* the additional details regarding each transformation pop up.

For a table one may choose, what types of transformations to show:

Show Successful Transformations;



Show Failed Transformations;

O Show Transformations Without Changes.

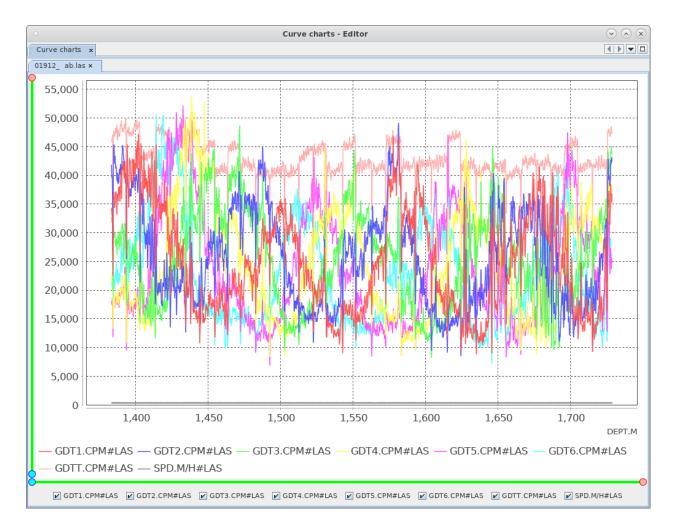
Upon a double click with the left mouse button on the transformation, related to a document, transfer to Editor is performed in order to view the changes.



### Additional Tabs on Data Panel

### View Curve Charts

The option View Curves in *las*-file shows the curve charts, described in *las*-file (the call of this tab is described in detail in the section «View Curve Charts in *las*-file»).

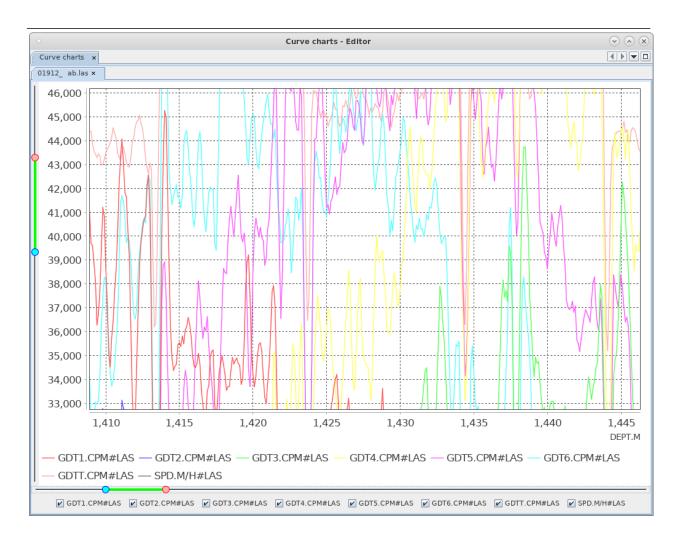


The View Curve Charts tab provides an opportunity of filtering the displayed data by the name of the curve (the charts of only ticked graphs are displayed).

Vertically, a Depth Scale is displayed, horizontally – Scale of Curve Values is displayed. The sliders near them control the displayed segments. As well an area may be selected directly on the graph, and it will be automatically displayed.

Also, the Legend is presented in the component. It provides a relation between a curve chart and its name on the basis of the color of the curve.





Also, in the tab, the following functionality is provided through a call of the context menu:

- 1. Settings deal with editing of the component's overview:
  - a. Header display and style of the header;
  - b. Graph signatures of the axes, marks, increment and display of the grid;
  - c. Advanced a background picture;
- 2. Save Obtained Result:
  - a. Print Document;
  - b. Copy copy the image for processing in a third party application;
  - c. Save AS images in the PNG format;
- 3. Scaling by All Axes, by the abscissa axis, and by the ordinate axis:
  - a. Zoom In;
  - b. Zoom Out;
  - c. Auto-Scaling.

### © Geoleader



### **Curves** Linking

Curves linking is a checkset, which enables on to compare the curves in the las-files and the corresponding curves in the las-files from the control measurements.

Linking shall mean matching of the curves in the set interval with a set error. The error is determined on the basis of a type of the curve, the interval is calculated on the basis of the interval of the control measurement curve.

The following opportunities are available in the tab:



Show Curves, not Passed Linking Control

Opens a visual comparative analysis of non-matching curves in the las-file and the control las-file as graphs of these curves.

View is opened in the View Curve Charts tab, all the functionality of this tab is also available (See the sections «View Curve Charts in las-file» and «Curve Charts»).

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Save to File

Show/Hide Warnings



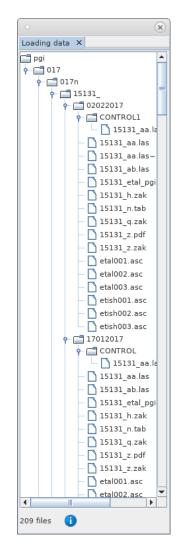
## **Operation Scenarios**

## Loading, checking, and transforming the data

In order to load the information the following is necessary:

1. Select a checkset

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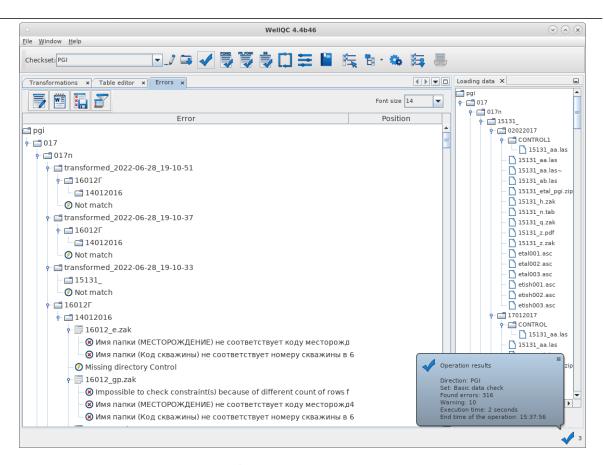


Then, the material shall open in the File Catalog tab:

3. Click on Check Uploaded Data 🗸

Upon completion of the check the application shall open the Errors tab, and in the lower right corner the general information regarding the check result shall appear:





4. Click on Data Transformation



Upon completion of the data transformation the application shall automatically transfer to the Transformations tab, and the general information regarding the completed operation shall also appear in the lower right corner:



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After repeated check of the material one shall be able to see that the number of discrepancies and errors became much smaller.



## View and Edit Data

In the Errors tab the whole list of errors and warnings, found in the uploaded data, is displayed. Each error or warning may be viewed and corrected in the Text Editor (for *las* files (1.2, 2.0, and 3.0), or any text document), or in the Table Editor (the db/dbf files).

After the check of the uploaded data, please, follow the instructions:

- 1. Open the document for editing with any convenient method:
  - a. Highlight the required document in the File Catalog, select Open in Text Editor in the context menu

or

b. Select the necessary error in the checked data and go to the document with the double click of the mouse

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2. It is clear by the errors, that a key problem is in the line with position number 16. Edit this file, putting the corresponding value for the TOP column and save the changes with a

click on the 🗖 icon.

3. Further on, the check may be performed again in order to make sure that this document does not already appear among the Errors, as we at once have corrected all the errors, related to it, with our actions:

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## Search of Value in Reference

In some checksets the data check is performed by Stock. These errors in the table form have a direct relation to references.

1. Run the Check by Stock on the uploaded data

Transformations × Tex	tt editor x Table editor x Curve linking x Errors x		Loading data ×	
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15122 n.tab	Field Организация-подрядчик ends with a whitespace	6	- 01069g4gc.pdf	
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This icon shows that the value may be viewed and compared to the value in the reference.

2. For more visual clarity it is more convenient to go to the Text Editor tab with a double click on the required cell in the Data column.



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In the bottom the error of interest to us is indicated.

3. Double click on the icon.

The corresponding reference «Stock (List of wells)», in advance sorted by Field – name, stated in the structure tree, shall open:

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	000_	076416000_00097P	076416000_00097P	416	076
	000_	076416000_00098P	076416000_00098P	416	076
	000_	076416000_00116P	076416000_00116P	416	076
	000_	076416000_00118P	076416000_00118P	416	076
	000_	076416000_00155P	076416000_00155P	416	076
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Basing on the obtained values, the data in the document may be correctly edited.