

Predicted ML Classification Arc

ML Classification Heatmap

Introducing

# RoQC LogQA

“ increasing the quality of your well log data –  
a mandatory requirement if the well logs will be used in automate,  
“digital oilfield” processes. ”

LogQA

# Predicted ML Classification Arc

ML Classification Heatmap

1 Ingestion from Multiple Data Sources

2 Deterministic & ML Data Quality Result Filtering

3 Dashboard and Charting

4 Correction and Quality Improvement

LogQA

# Ingestion from Multiple Data Sources Native SaaS in DELFI OSDU or on Premises

Menu | Status: Connected to Service. | RoQC Log QA | RoQC Website | Documentation | 1.0.0.108

**Data Source**

- DELFI logs
- OSDU logs
- ProSource logs**
- Las files

**Results**

- Charts
- Clean up
- Maintenance
- App log

### ProSource logs

Setup | Acquisition

#### ProSource Acquisition settings:

Source URL:

User name:

Password:

Show password

Project:

#### Schedule settings:

Monthly

Weekly

Daily

Hourly

#### Scheduled jobs:

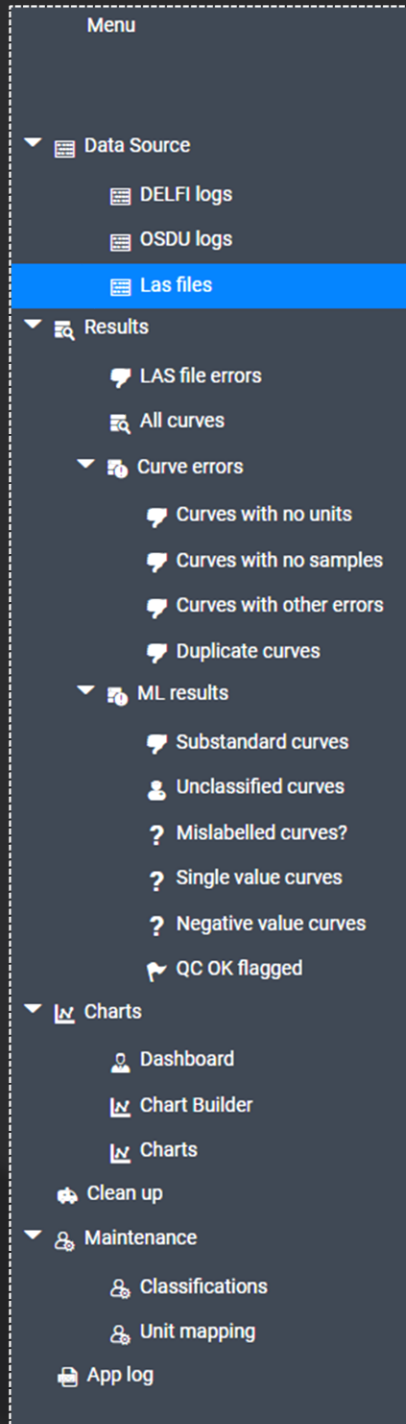
Drag a column header here to group its column

Excel Export

| Source | URL | Data Partition ID | Kind | Start date | Last run | Next run | Frequency | Last result |
|--------|-----|-------------------|------|------------|----------|----------|-----------|-------------|
|        |     |                   |      |            |          |          |           |             |

No records to display

F  
E  
A  
T  
U  
R  
E  
S  
T  
A  
C  
K



.....ingest well logs stored in OSDU - DELFI – On Prem.

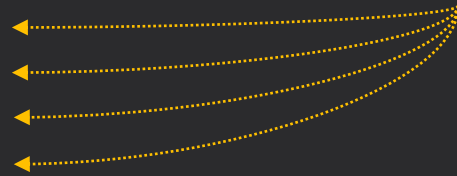


.....ML Processing Results are split in 4 sections

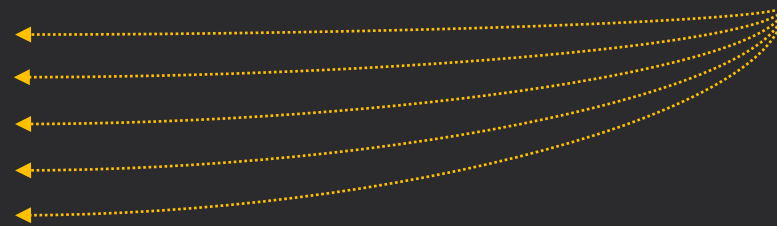
..... 1. Las files with fatal errors that mean that they can not be reliably read

..... 2. Complete Well Log Curve overview

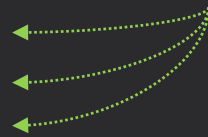
..... 3. Well log curves with serious, easily identified, data quality issues



..... 4. ML results are well log curves that do not match the quality criteria for the type of log curve that they claim to be



..... Visual inspection & Analysis



..... Clean-up Editor, flexible and powerful tool for bulk corrections of the erroneous log data.

..... Manage classifications and units





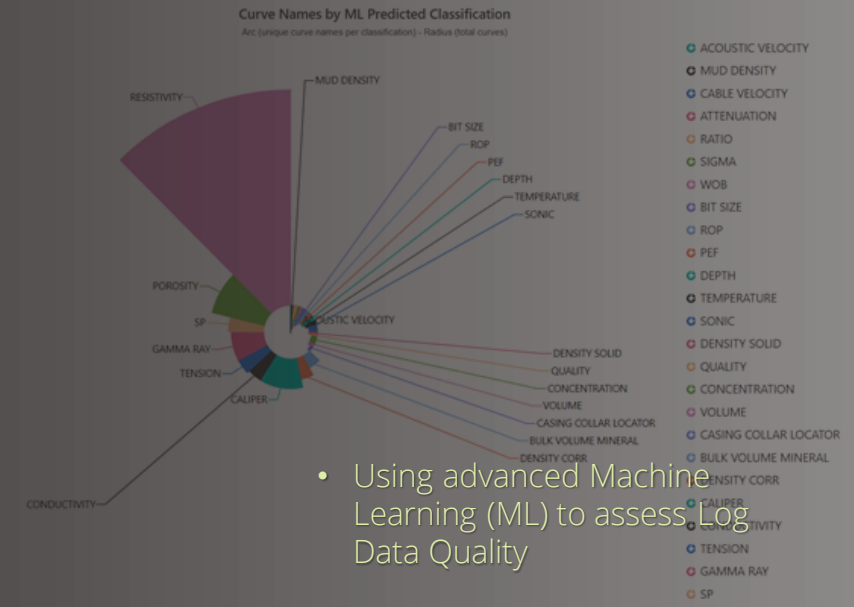
# Example of usage

## RoQC LogQA for On Prem

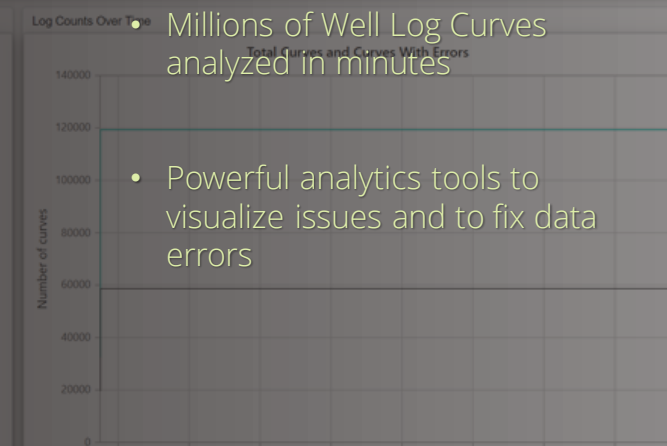
A Petrophysicist in a major O&G company was working on a large data set of Well logs, stored in LAS format files on disk. The Petrophysicist wanted to populate their current interpretation project with more log data to complete the existing wells and to populate with additional wells and associated log data. The challenge was thousands of LAS files that had to be loaded and verified. They initiated a project to automatically batch load multiple LAS format files to a staging project prior to be distributed to the interpretation project. Based on past experience they new that they would encounter LAS file duplications, errors and various issues with the curve data stored. In order to improve quality of work, save time for the Petrophysicist, and minimize man hours for Data Management it was decided to use RoQC LogQA tool in a data quality verification stage before the batch loading was initiated. RoQC LogQA was used to ingest all the thousands of LAS Well Log files and to automatically perform an advanced ML analysis to classify LAS file errors, to store and display log curve data quality results, and to improve data quality.

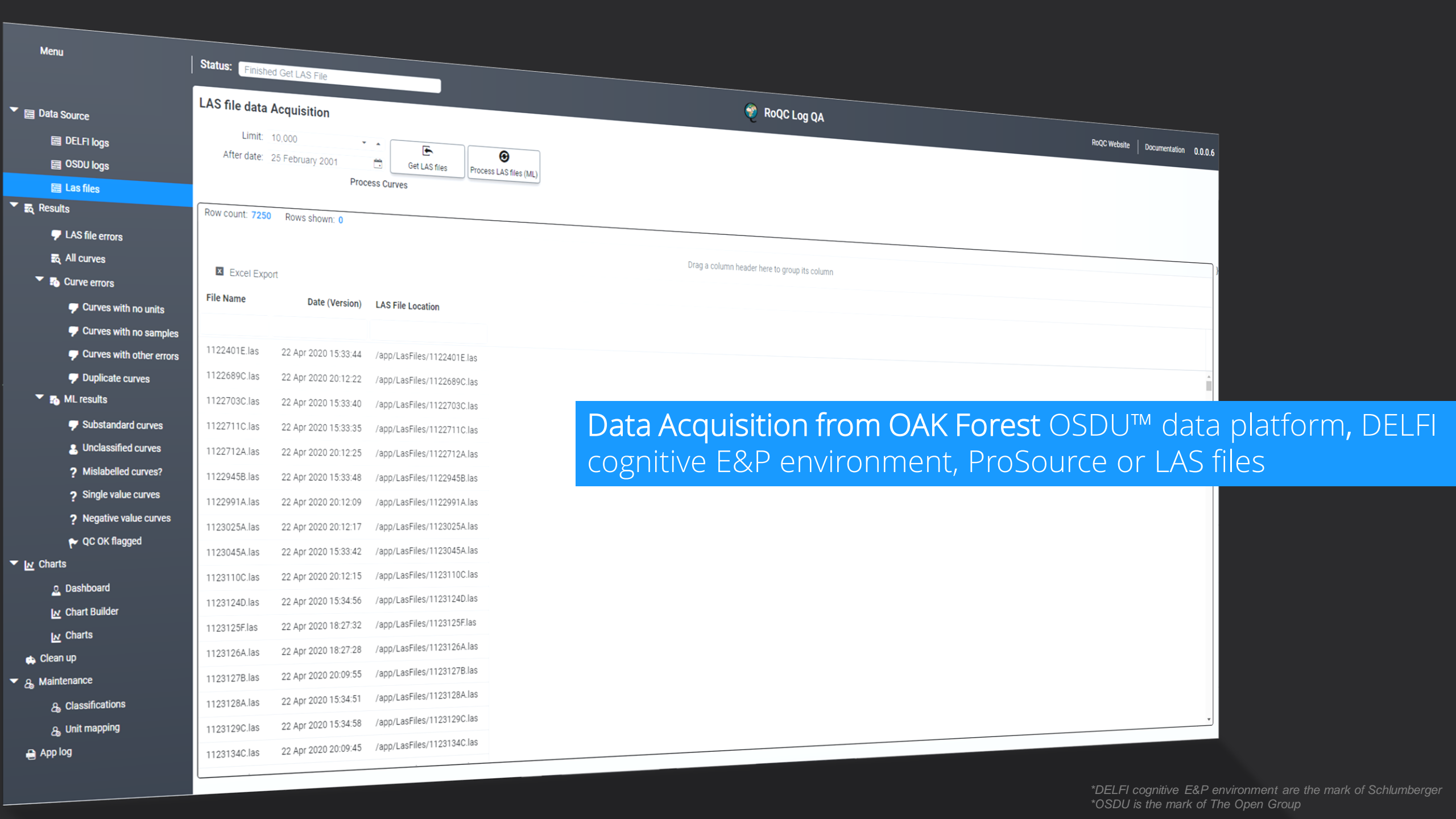
The Petrophysicist used the tool to:

- screen large numbers of files quickly and efficiently, sorting out files that need to be corrected before batch loading
- provide a quick way to check the actual values of logs, either with statistical analysis (dashboard) or graphical (chart) representation. This way, log channels with wrong values can easily be found, as can curves with only one value, mislabeled curves, curves with no samples, etc.
- correct identified issue(s)



- Using advanced Machine Learning (ML) to assess Log Data Quality





Status: Finished Get LAS File

### LAS file data Acquisition

Limit: 10,000  
 After date: 25 February 2001

Get LAS files    Process LAS files (ML)

Process Curves

Row count: 7250    Rows shown: 0

Excel Export

Drag a column header here to group its column

| File Name    | Date (Version)       | LAS File Location          |
|--------------|----------------------|----------------------------|
| 1122401E.las | 22 Apr 2020 15:33:44 | /app/LasFiles/1122401E.las |
| 1122689C.las | 22 Apr 2020 20:12:22 | /app/LasFiles/1122689C.las |
| 1122703C.las | 22 Apr 2020 15:33:40 | /app/LasFiles/1122703C.las |
| 1122711C.las | 22 Apr 2020 15:33:35 | /app/LasFiles/1122711C.las |
| 1122712A.las | 22 Apr 2020 20:12:25 | /app/LasFiles/1122712A.las |
| 1122945B.las | 22 Apr 2020 15:33:48 | /app/LasFiles/1122945B.las |
| 1122991A.las | 22 Apr 2020 20:12:09 | /app/LasFiles/1122991A.las |
| 1123025A.las | 22 Apr 2020 20:12:17 | /app/LasFiles/1123025A.las |
| 1123045A.las | 22 Apr 2020 15:33:42 | /app/LasFiles/1123045A.las |
| 1123110C.las | 22 Apr 2020 20:12:15 | /app/LasFiles/1123110C.las |
| 1123124D.las | 22 Apr 2020 15:34:56 | /app/LasFiles/1123124D.las |
| 1123125F.las | 22 Apr 2020 18:27:32 | /app/LasFiles/1123125F.las |
| 1123126A.las | 22 Apr 2020 18:27:28 | /app/LasFiles/1123126A.las |
| 1123127B.las | 22 Apr 2020 20:09:55 | /app/LasFiles/1123127B.las |
| 1123128A.las | 22 Apr 2020 15:34:51 | /app/LasFiles/1123128A.las |
| 1123129C.las | 22 Apr 2020 15:34:58 | /app/LasFiles/1123129C.las |
| 1123134C.las | 22 Apr 2020 20:09:45 | /app/LasFiles/1123134C.las |

Data Acquisition from OAK Forest OSDU™ data platform, DELFI cognitive E&P environment, ProSource or LAS files

\*DELFI cognitive E&P environment are the mark of Schlumberger  
\*OSDU is the mark of The Open Group

Status: Processed 6 of 7250 LAS files

Information Processing Curves...

### LAS file data Acquisition

Limit: 10,000

After date: 03 February 2019

Get LAS files

Process LAS files (ML)

Process Curves

Row count: 7250 Rows shown: 0

Excel Export

Drag a column header here to group its column

Cancel

| File Name    | Date (Version)       | LAS File Location          |
|--------------|----------------------|----------------------------|
| 1122401E.las | 22 Apr 2020 15:33:44 | /app/LasFiles/1122401E.las |
| 1122689C.las | 22 Apr 2020 20:12:22 | /app/LasFiles/1122689C.las |
| 1122703C.las | 22 Apr 2020 15:33:40 | /app/LasFiles/1122703C.las |
| 1122711C.las | 22 Apr 2020 15:33:35 | /app/LasFiles/1122711C.las |
| 1122712A.las | 22 Apr 2020 20:12:25 | /app/LasFiles/1122712A.las |
| 1122945B.las | 22 Apr 2020 15:33:48 | /app/LasFiles/1122945B.las |
| 1122991A.las | 22 Apr 2020 20:12:09 | /app/LasFiles/1122991A.las |
| 1123025A.las | 22 Apr 2020 20:12:17 | /app/LasFiles/1123025A.las |
| 1123045A.las | 22 Apr 2020 15:33:42 | /app/LasFiles/1123045A.las |
| 1123110C.las | 22 Apr 2020 20:12:15 | /app/LasFiles/1123110C.las |
| 1123124D.las | 22 Apr 2020 15:34:56 | /app/LasFiles/1123124D.las |
| 1123125F.las | 22 Apr 2020 18:27:32 | /app/LasFiles/1123125F.las |
| 1123126A.las | 22 Apr 2020 18:27:28 | /app/LasFiles/1123126A.las |
| 1123127B.las | 22 Apr 2020 20:09:55 | /app/LasFiles/1123127B.las |
| 1123128A.las | 22 Apr 2020 15:34:51 | /app/LasFiles/1123128A.las |
| 1123129C.las | 22 Apr 2020 15:34:58 | /app/LasFiles/1123129C.las |
| 1123134C.las | 22 Apr 2020 20:09:45 | /app/LasFiles/1123134C.las |
| 1123135B.las | 22 Apr 2020 18:27:30 | /app/LasFiles/1123135B.las |
| 1123143C.las | 22 Apr 2020 15:33:29 | /app/LasFiles/1123143C.las |
| 1123152D.las | 22 Apr 2020 15:33:37 | /app/LasFiles/1123152D.las |
| 1123153D.las | 22 Apr 2020 15:33:46 | /app/LasFiles/1123153D.las |
| 1123157A.las | 22 Apr 2020 18:26:11 | /app/LasFiles/1123157A.las |
| 1123162A.las | 22 Apr 2020 15:33:32 | /app/LasFiles/1123162A.las |
| 1123171A.las | 22 Apr 2020 20:12:12 | /app/LasFiles/1123171A.las |

Advanced ML processing  
RoQC LogQA ML engine based on 30+ years of domain knowledge

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### LAS file errors

Data Edit/view LAS files

Row count: 86 Rows selected: 1 Rows shown: 0

Excel Export

| Well Name      | Well UWI     | Error Type            | Log Data Location           | Error  | Date (Version) |
|----------------|--------------|-----------------------|-----------------------------|--|----------------|
| 04WC2NW31      | 4902507679   | Missing Depth Channel | /app/LasFiles/2507679C.las  | Las file's first channel name was 'Gamma Ray', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma... | 22 Apr 2020    |
| 31WC1SW25      | 4902407757   | Missing Depth Channel | /app/LasFiles/2507757C.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma Ray'     | 22 Apr 2020    |
| 29LAKSW25      | 4902507787   | Missing Depth Channel | /app/LasFiles/2507787D.las  | Las file's first channel name was 'Gamma Ray', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma... | 22 Apr 2020    |
| 21WC1SW26      | 4902507844   | Missing Depth Channel | /app/LasFiles/2507844B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 09WC1NW25      | 4902508270   | Missing Depth Channel | /app/LasFiles/2508270B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 37WC1NW26      | 4902508304   | Missing Depth Channel | /app/LasFiles/2508304B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 08WC1SW24      | 4902508569   | Missing Depth Channel | /app/LasFiles/2508569B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 08WC1SW24      | 4902508569   | Missing Depth Channel | /app/LasFiles/2508569B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 05WC1SW24      | 4902508604   | Missing Depth Channel | /app/LasFiles/2508604B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 05WC1SW24      | 4902508604   | Missing Depth Channel | /app/LasFiles/2508604B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 36AXWC2NW23    | 4902508620   | Missing Depth Channel | /app/LasFiles/2508620B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 08WC2SE06      | 4902509398   | Missing Depth Channel | /app/LasFiles/2509398B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| Shoshone 66-11 | 49-013-06783 | Missing Depth Channel | /app/LasFiles/2506783B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| MDU # 3-36     | 49-013-22025 | Missing Depth Channel | /app/LasFiles/25022025B.las | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 11ATR14SE02S   | 4902511028   | Missing Depth Channel | /app/LasFiles/2511028B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 13WC1SE06      | 4902511572   | Missing Depth Channel | /app/LasFiles/2511572B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 13WC1SE06      | 4902511572   | Missing Depth Channel | /app/LasFiles/2511572B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 34WC2SW06      | 4902511581   | Missing Depth Channel | /app/LasFiles/2511581B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 30WC1SE02S     | 4902511680   | Missing Depth Channel | /app/LasFiles/2511680B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 30WC1SE02S     | 4902511680   | Missing Depth Channel | /app/LasFiles/2511680B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 06AWC1NE03     | 4902511726   | Missing Depth Channel | /app/LasFiles/2511726B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |
| 05WC2NE34      | 4902520373   | Missing Depth Channel | /app/LasFiles/2520373B.las  | Las file's first channel name was 'Gamma Ray', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma... | 22 Apr 2020    |
| 14WC2SE34      | 4902520472   | Missing Depth Channel | /app/LasFiles/2520472B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma Ray'     | 22 Apr 2020    |
| 37WC2SW19      | 4902520650   | Missing Depth Channel | /app/LasFiles/2520650B.las  | Las file's first channel name was 'GK1', but should have contained 'DEP, DPTH, DMEA, MD or TIME'. Unit='GAPI', Description='Gamma...       | 22 Apr 2020    |

```

2507679C.las
UWI.          4902507679
STAT.        Wyoming
~Curve Information Block
Gamma Ray.GAPI 0: Gamma Ray
LTEN.LB       0: Surface Line Tension
TCURR.MA     0: Tool Current
TVOLT.V      0: Tool Voltage
ELTIM.SEC    0: Elapsed Time
ADPTH.FT     0: Actual Depth
MINMK.       0: Minute Mark Ticks
HVOLTA.V     0: Head Voltage Apparent
AMP3FT.MV    0: AMP3FT Amplitude
TT3FT.USEC   0: 3FT Travel Time
AMP5FT.MV    0: AMP5FT Amplitude
TT5FT.USEC   0: 5FT Travel Time
ATT3.DB/FT   0: Attenuation from 3'Amplitude
BONDIX.      0: Bond Index
CCL.         0: Casing Collar Locator
DEPT.FT      0 000 00 00: Depth
~Parameter Information Block
-A Depth Gamma Ray LTEN TCURR TVOLT ELTIM ADPTH MINMK HVOLTA AMP3FT TT3FT

```

**LAS format file errors**  
 Broken file headers that cannot be reliably read  
 E.g. missing header sections or a different number of header columns to data



All curves

Reload Data  
Data

Row count: 134921 Rows selected: 0 Rows shown: 134921

Excel Export

Drag a column header here to group its column

| Well Name           | Well UWI         | Curve name | Predicted by curve Name | Predicted by ML | ML score            | QC OK | Sample count | Description                 |
|---------------------|------------------|------------|-------------------------|-----------------|---------------------|-------|--------------|-----------------------------|
| Boulder 6C1-33D     |                  | AO20       | RESISTIVITY             |                 |                     |       |              |                             |
| AR FEE 1791 9-15    |                  | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937064051628113  | False | 19655        | ARRAY INDUCTION ONE FOOT Re |
| Boulder 11A1-33D    | 4903525980000    | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937050342559814  | False | 13753        | Array Induction One Foot Re |
| WELL                | UNIQUE WELL ID   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936955571174622  | False | 9118         | Array Induction One Foot Re |
| WELL                | UNIQUE WELL ID   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.085246503160000   |       |              |                             |
| Boulder 11B1-33D    |                  | AO20       | RESISTIVITY             |                 |                     |       |              |                             |
| AR FEE 1791 13-15   | 49-007-23002     | AO20       | RESISTIVITY             |                 |                     |       |              |                             |
| Boulder 11B1-33D    | 49035259810000   | AO20       | RESISTIVITY             |                 |                     |       |              |                             |
| AR FEE 1791 3 27    | 0049007230040000 | AO20       | RESISTIVITY             |                 |                     |       |              |                             |
| AR FEE 1791 5-27    | 049007230050000  | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937267899513245  | False | 779          | Array Induction One Foot Re |
| Boulder 11C1-33D    | 49035259820000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.99370999814414978 | False | 18539        | ARRAY INDUCTION ONE FOC     |
| AR FEE 1791 7-27    | 049007230060000  | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937043786048889  | False | 13417        | Array Induction One Foot Re |
| Boulder 11C1-33D    | 49035259820000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937003254890442  | False | 9004         | Array Induction One Foot Re |
| WELL                | UNIQUE WELL ID   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936521649360657  | False | 12667        | Array Induction One Foot Re |
| Federal C-037870    | 49025239950000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936965703964233  | False | 2886         | Array induction One Foot Re |
| Federal C-037870-29 | 49025239960000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9934830665588379  | False | 3187         | Array induction One Foot Re |
| Boulder 11C2-33D    |                  | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937002658843994  | False | 18423        | ARRAY INDUCTION ONE FOC     |
| Federal 5-42        | 49005622740000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936944842338562  | False | 20696        | Array Induction One Foot Re |
| Boulder 12B2-33D    |                  | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936907887458801  | False | 19002        | ARRAY INDUCTION ONE FOC     |
| Boulder 12B2-33D    |                  | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936490058898926  | False | 4236         | Array Induction One Foot Re |
| Ag Farm State 43-32 | 49005622830000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9937114119529724  | False | 19797        | ARRAY INDUCTION ONE FOC     |
| Boulder 13B1-33D    | 49035259860000   | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9933554530143738  | False | 14158        | ARRAY INDUCTION ONE FOC     |
| Boulder 13C1-33D    | 4903525987000    | AO20       | RESISTIVITY             | RESISTIVITY     | 0.9936425089836121  | False | 14378        | Array Induction One Foot Re |
| Scalp 23-10         | 49005626160000   | AO20       | RESISTIVITY             |                 |                     |       |              |                             |

Overview of all well log curves  
Well log curves available in the processed data set.  
Full visibility of 30 associated curve attributes.

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Curves with no units

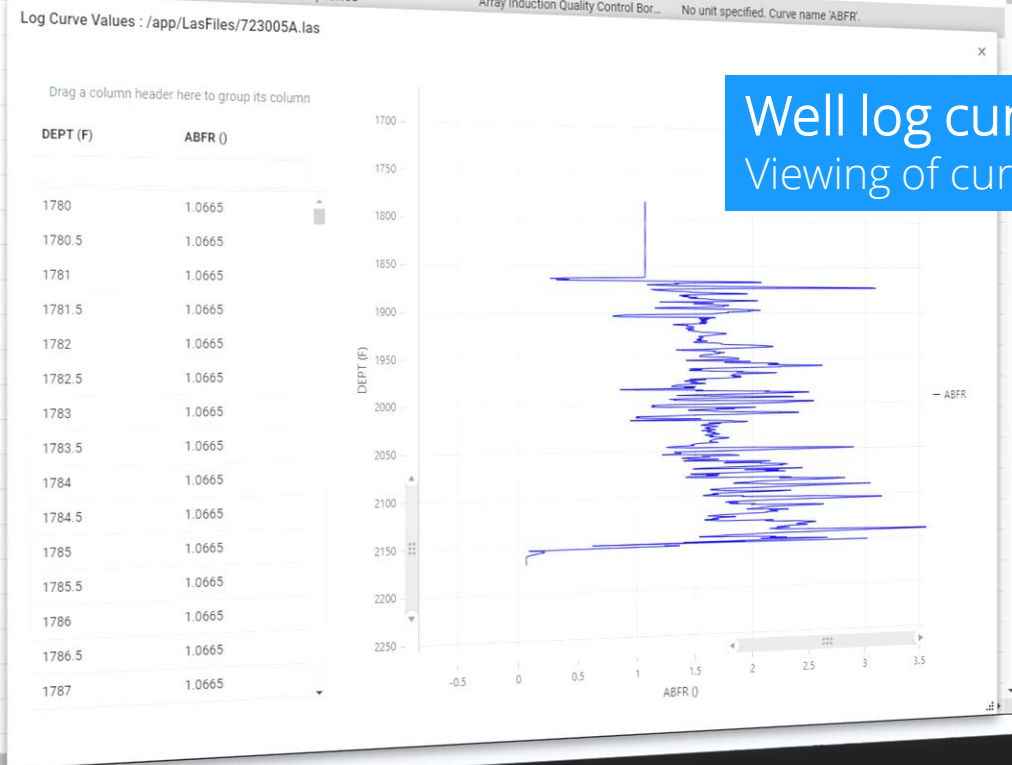
Reload Data   Add to clean up   **View curve values**   Edit curve values   Delete curve   Edit LAS header

Data   QC curves   Edit/view curves

Row count: 10490   Rows selected: 1   Rows shown: 10490

Excel Export

| Well Name                     | Well UWI        | Curve name | Curve unit | Error type        | Curve description                      | Error                                 |
|-------------------------------|-----------------|------------|------------|-------------------|--|---------------------------------------|
| EIGHTMILE 7-150R              | 49-007-23450    | A194       |            | No Unit Specified |  |                                       |
| AR FEE 1791 5-27              | 049007230050000 | ABFR       |            | No Unit Specified | OA194                                  | No unit specified. Curve name 'A194'. |
| C.G. ROAD 15-130              | 49-037-27196    | ABTF       |            | No Unit Specified | Array Induction Quality Control Bor... | No unit specified. Curve name 'ABFR'. |
| TWO RIM UNIT 21-10D           | 49037275190000  | ABTF       |            |                   |  |                                       |
| THREE MILE 23-100D            | 49007237400000  | ABTF       |            |                   |  |                                       |
| SIBERIA RIDGE 43-23D          | 49037285990000  | ABTF       |            |                   |  |                                       |
| SPRING CREEK 93               | 49029312590000  | ABTF       |            |                   |  |                                       |
| CHAMPLIN 222 H-60D            | 490072343700    | ABTF       |            |                   |  |                                       |
| STANDARD DRAW 08-18-18-93     | 4900723640      | ABTF       |            |                   |  |                                       |
| STANDARD DRAW 10-18-18-93     | 4900723641      | ABTF       |            |                   |  |                                       |
| STANDARD DRAW 12A-18-18-93    | 4900723642      | ABTF       |            |                   |  |                                       |
| STANDARD DRAW 7-18-18-93      | 4900723643      | ABTF       |            |                   |  |                                       |
| EIGHTMILE 7-150R              | 49-007-23450    | ABTF       |            |                   |  |                                       |
| HORSE PASTURE FEDERAL 34-28D  | 49007244050000  | ABTF       |            |                   |  |                                       |
| HORSE PASTURE FEDERAL L14-28D | 49007244070000  | ABTF       |            |                   |  |                                       |
| ECHO SPRINGS FEDERAL 22-30D   | 49007244110000  | ABTF       |            |                   |  |                                       |
| ECHO SPRINGS FEDERAL 41-30D   | 49007244130000  | ABTF       |            |                   |  |                                       |
| C.G. ROAD 15-130              | 49-037-27196    | ABTN       |            |                   |  |                                       |
| TWO RIM UNIT 21-10D           | 49037275190000  | ABTN       |            |                   |  |                                       |
| THREE MILE 23-100D            | 49007237400000  | ABTN       |            |                   |  |                                       |
| SIBERIA RIDGE 43-23D          | 49037285990000  | ABTN       |            |                   |  |                                       |
| SPRING CREEK 93               | 49029312590000  | ABTN       |            |                   |  |                                       |
| CHAMPLIN 222 H-60D            | 490072343700    | ABTN       |            |                   |  |                                       |
| STANDARD DRAW 08-18-18-93     | 4900723640      | ABTN       |            |                   |  |                                       |



Well log curves with errors  
Viewing of curve sample values

- Menu
- Delfi set up
- Data acquisition
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  - Curve errors
    - Curves with no units**
    - Curves with no samples
    - Curves with other errors
    - Duplicate curves
  - ML results
    - Substandard curves
    - Unclassified curves
    - Mislabelled curves?
    - Single value curves
    - Negative value curves
    - QC OK flagged
  - Charts
    - Dashboard
    - Chart Builder
    - Charts
  - Clean up
  - Maintenance
    - Classifications
    - Unit mapping
  - App log

Curves with no units

Data      QC curves      Edit/view curves

Row count: 10490    Rows selected: 9    Rows shown: 10490

Excel Export

Drag a column header here to group its column

| Well Name                 | Well UWI        | Curve name | Curve unit | Error type        | Curve description                      | Error                                |
|---------------------------|-----------------|------------|------------|-------------------|--|--------------------------------------|
| NEO CS FEDERAL #7         |                 |            |            |                   |  |                                      |
| NEO CS FEDERA #5          |                 |            |            | No Unit Specified | CCL (F)                                | No unit specified. Curve name "      |
| NEO CS FEDERAL #6         |                 |            |            | No Unit Specified | CCL (F)                                | No unit specified. Curve name "      |
| ROSE DRAW UNIT 44-19-5277 |                 |            |            | No Unit Specified | CCL (F)                                | No unit specified. Curve name "      |
| ROSE DRAW UNIT 44-19-5277 |                 |            |            | No Unit Specified | CCL (F)                                | No unit specified. Curve name "      |
| CGU FEDERAL 33-35-5178    |                 |            |            |                   |  |                                      |
| CGU FEDERAL 33-35-5178    |                 |            |            |                   |  |                                      |
| CGU FEDERAL 34-35-5178    |                 |            |            |                   |  |                                      |
| CGU FEDERAL 34-35-5178    |                 |            |            |                   |  |                                      |
| C. G. ROAD 15-130         | 49-037-27196    | A114       |            | No Unit Specified | OA114                                  | No unit specified. Curve name 'A114. |
| CHAMPLIN 222 H-60D        | 490072343700    | A114       |            | No Unit Specified | OA114                                  | No unit specified. Curve name 'A114. |
| EIGHTMILE 7-150R          | 49-007-23450    | A114       |            | No Unit Specified | OA114                                  | No unit specified. Curve name 'A114. |
| C. G. ROAD 15-130         | 49-037-27196    | A194       |            | No Unit Specified | OA194                                  | No unit specified. Curve name 'A194. |
| CHAMPLIN 222 H-60D        | 490072343700    | A194       |            | No Unit Specified | OA194                                  | No unit specified. Curve name 'A194. |
| EIGHTMILE 7-150R          | 49-007-23450    | A194       |            | No Unit Specified | OA194                                  | No unit specified. Curve name 'A194. |
| AR FEE 1791 5-27          | 049007230050000 | ABFR       |            | No Unit Specified | Array Induction Quality Control Bor... | No unit specified. Curve name 'ABFR. |
| C. G. ROAD 15-130         | 49-037-27196    | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |
| TWO RIM UNIT 21-10D       | 49037275190000  | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |
| THREE MILE 23-100D        | 49007237400000  | ABTF       |            | No Unit Specified | Far borehole amplitude                 | No unit specified. Curve name 'ABTF. |
| SIBERIA RIDGE 43-23D      | 49037285990000  | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |
| SPRING CREEK 93           | 49029312590000  | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |
| CHAMPLIN 222 H-60D        | 490072343700    | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |
| STANDARD DRAW 08-18-18-93 | 4900723640      | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |
| STANDARD DRAW 10-18-18-93 | 4900723641      | ABTF       |            | No Unit Specified | FAR BOREHOLE AMPLITUDE                 | No unit specified. Curve name 'ABTF. |

Well log curves with errors  
 Well log curves which do not match the ML criteria for the curve unit.

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    - Curves with no samples
    - Curves with other errors
    - Duplicate curves
  - ML results
    - Substandard curves
    - Unclassified curves
    - Mislabelled curves?
    - Single value curves
    - Negative value curves
    - QC OK flagged
  - Charts
    - Dashboard
    - Chart Builder
    - Charts
  - Clean up
  - Maintenance
    - Classifications
    - Unit mapping
  - App log

- Defi set up
- Data acquisition
  - Defi logs
  - Las files
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  - All curves
  - Curve errors
    - Curves with no units
    - Curves with no samples
    - Curves with other errors**
    - Duplicate curves
  - ML results
    - Substandard curves
    - Unclassified curves
    - Mislabelled curves?
    - Single value curves
    - Negative value curves
    - QC OK flagged
  - Charts
    - Dashboard
    - Chart Builder
    - Charts
  - Clean up
  - Maintenance
    - Classifications
    - Unit mapping
  - App log

### Curves with other errors

Row count: 3875 Rows selected: 14 Rows shown: 3875

Excel Export

Drag a column header here to group its column

| Well Name                      | Well UWI       | Curve name | Curve unit | Error type              | Curve description                    | Error  |
|--------------------------------|----------------|------------|------------|-------------------------|--------------------------------------|--|
| NEO CS FEDERAL #7              |                |            | API        | Missing Curve Name      | GR (F)                               | Curve name is missing. (Unit 'API')                                    |
| NEO CS FEDERAL #7              |                |            | MV         | Missing Curve Name      | 3 Foot Amplitude (F)                 | Curve name is missing. (Unit 'MV')                                     |
| NEO CS FEDERAL #7              |                |            | ◆S         | Missing Unit Conversion | 3 Foot Floating Gate Transit Time (L | DisplaySymbol '◆S' was not found in the unit conversion list. Curve n  |
| NEO CS FEDERA #5               |                |            | API        | Missing Curve Name      | GR (F)                               | Curve name is missing. (Unit 'API')                                    |
| NEO CS FEDERA #5               |                |            | MV         | Missing Curve Name      | GR (F)                               | Curve name is missing. (Unit 'MV')                                     |
| NEO CS FEDERA #5               |                |            | ◆S         | Missing Unit Conversion | 3 Foot Floating Gate Transit Time (L | DisplaySymbol '◆S' was not found in the unit conversion list. Curve n  |
| NEO CS FEDERAL #6              |                |            | API        | Missing Curve Name      | GR (F)                               | Curve name is missing. (Unit 'API')                                    |
| NEO CS FEDERAL #6              |                |            | MV         | Missing Curve Name      | GR (F)                               | Curve name is missing. (Unit 'MV')                                     |
| NEO CS FEDERAL #6              |                |            | ◆S         | Missing Unit Conversion | 3 Foot Floating Gate Transit Time (L | DisplaySymbol '◆S' was not found in the unit conversion list. Curve n  |
| 02DWC2NW22                     | 49025238880000 |            | CCL        | Missing Unit Conversion | Casing Collar Locator                | DisplaySymbol 'CCL' was not found in the unit conversion list. Curve   |
| 02DWC2NW22                     | 49025238880000 |            | AMP3.MV    | Missing Unit Conversion | CBL 3' Amplitude                     | DisplaySymbol 'AMP3.MV' was not found in the unit conversion list. C   |
| BOTHWELL SYNCLINE FED 1-28H    | 049-025-23921  |            | CCL        | Missing Unit Conversion | Casing Collar Locator                | DisplaySymbol 'CCL' was not found in the unit conversion list. Curve   |
| BOLT 404-05H                   |                |            | degF       | Missing Curve Name      | Temperature                          | Curve name is missing. (Unit 'degF')                                   |
| Combs Ranch 29-33-70 C 4H      | 49-009-29269   |            | CCL        | Missing Unit Conversion | Casing Collar Locator                | DisplaySymbol 'CCL' was not found in the unit conversion list. Curve   |
| Smith Creek 6-32-70 B4H        | 49-009-29051   |            | CCL        | Missing Unit Conversion | Casing Collar Locator                | DisplaySymbol 'CCL' was not found in the unit conversion list. Curve   |
| Linden 20-34-69 B 2H           | NA             |            | CCL        | Missing Unit Conversion | Casing Collar Locator                | DisplaySymbol 'CCL' was not found in the unit conversion list. Curve   |
| Linden 20-34-69 B 2H           | NA             |            | AMP3FT.MV  | Missing Unit Conversion | AMP3FT Amplitude                     | DisplaySymbol 'AMP3FT.MV' was not found in the unit conversion list    |
| Combs 29-33-70 C SX 7H         | 49-009-29269   |            | CCL        | Missing Unit Conversion | Casing Collar Locator                | DisplaySymbol 'CCL' was not found in the unit conversion list. Curve   |
| Combs 29-33-70 C SX 7H         | 49-009-29269   |            | AMP3FT.MV  | Missing Unit Conversion | AMP3FT Amplitude                     | DisplaySymbol 'AMP3FT.MV' was not found in the unit conversion list    |
| Stoddard 40-71-36A-2FH         |                |            | degC       | Missing Curve Name      | Temperature                          | Curve name is missing. (Unit 'degC')                                   |
| SPLIT HILL UNIT 37-68-27-3TH   | 49-009-30064   |            | GR.        | Missing Unit Conversion | Gamma Ray                            | DisplaySymbol 'GR.' was not found in the unit conversion list. Curve n |
| SPLIT HILL 37-68 27-1H         | 49-009-30065   |            | GR.        | Missing Unit Conversion | Gamma Ray                            | DisplaySymbol 'GR.' was not found in the unit conversion list. Curve n |
| Dilts Ranch State 38-71 16-2FH |                |            | degC       | Missing Curve Name      | Temperature                          | Curve name is missing. (Unit 'degC')                                   |
| Dilts Ranch State 38-71 16-2FH |                |            | AMP3.MV    | Missing Unit Conversion | CBL 3' Amplitude                     | DisplaySymbol 'AMP3.MV' was not found in the unit conversion list. C   |
| 14SD3NE34                      | 49025075270000 |            | AMP3.MV    | Missing Unit Conversion | CBL 3' Amplitude                     | DisplaySymbol 'AMP3.MV' was not found in the unit conversion list. C   |

Well log curves with other errors  
 Well log curves which do not match the ML criteria for the curve unit.

E.g. a well log curve with "Missing Unit Conversion"



### Duplicate curves

Buttons: Reload Data (Data), Delete Selected (Curve Selection), Keep Selected (Curve Selection)

### Duplicate Sets:

Row count: 2979 Rows selected: 1 Rows shown: 0

Drag a column header here to group its column

| Count |
|-------|
| 245   |
| 236   |
| 154   |
| 145   |
| 123   |
| 121   |
| 101   |
| 97    |
| 62    |
| 62    |
| 61    |
| 61    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 60    |
| 58    |
| 58    |
| 57    |

### Details:

Row count: 101 Rows selected: 3 Rows shown: 101

Excel Export

Drag a column header here to group its column

| Well Name              | Well UWI | Curve name | Predicted by curve Name | Predicted by ML     | ML score          |
|------------------------|----------|------------|-------------------------|---------------------|-------------------|
| Linn 30o4 Cabrito Unit |          | CONGL      | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | DOL        | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | GYP        | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | IGNE       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | LMST       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | META       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | MRLST      | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | SALT       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | SHCOL      | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | SHGY       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | SLTST      | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | TILL       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 30o4 Cabrito Unit |          | BLANK      | Unclassified            | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | CORE       | Unclassified            | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | DST        | Unclassified            | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | ANHY       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | BENT       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | BREC       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | CHT        | Unclassified            | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | CLYST      | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | COAL       | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |
| Linn 26-16 SHB         |          | CONGL      | BULK VOLUME MINERAL     | BULK VOLUME MINERAL | 0.993486762046814 |

Duplicate well log curves  
Well log curves that are binary identical

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      - Curves with no samples
      - Curves with other errors
      - Duplicate curves**
    - ML results
      - Substandard curves
      - Unclassified curves
      - Mislabelled curves?
      - Single value curves
      - Negative value curves
      - QC OK flagged
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    - Clean up
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      - Unit mapping
    - App log

Status: Retrieved curve errors

### Substandard curves

Data      QC curves      Edit/view curves

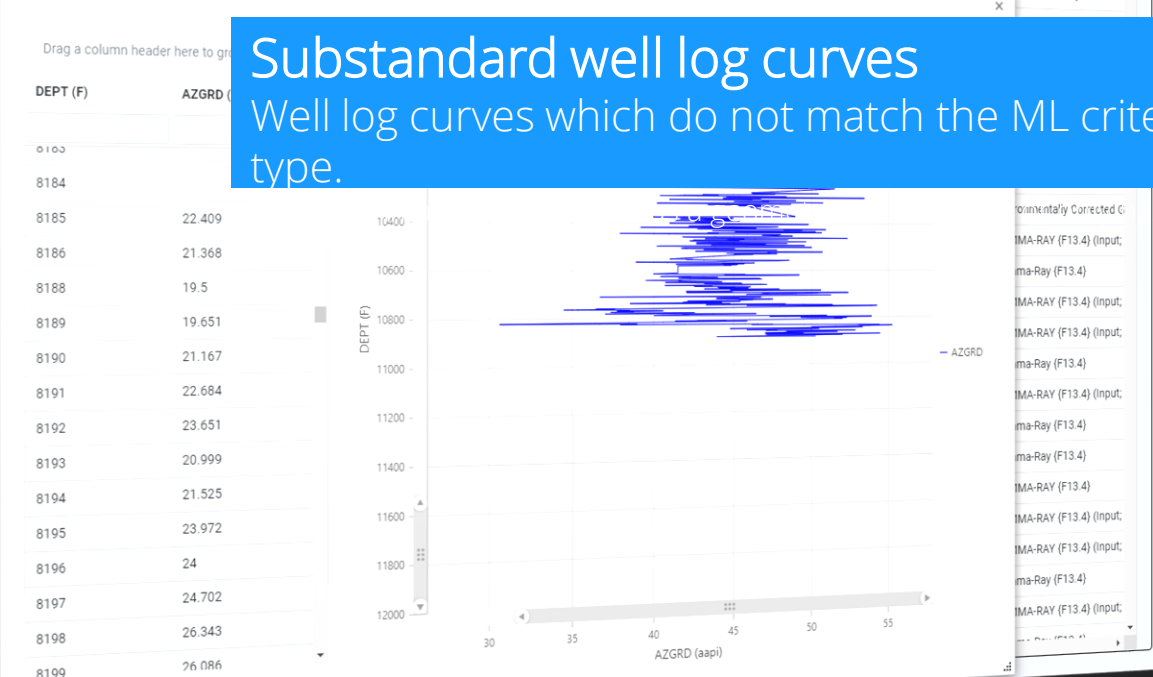
Row count: 14010   Rows selected: 1   Rows shown: 295

Excel Export

Drag a column header here to group its column

| Well Name                  | Well UWI       | Curve name | Predicted by curve Name | Predicted by ML | ML score            | QC OK | Sample count | Description       |
|----------------------------|----------------|------------|-------------------------|-----------------|---------------------|-------|--------------|-------------------|
| SLPU                       | 49005615980000 | AZGRD      | Unclassified            | GAMMA RAY       | 0.6475080251693726  | False | 2698         | Down Az Gamma Ray |
| SLPU                       | 49005616220000 | AZGRD      | Unclassified            | SIGMA           | 0.14280468225479126 | False | 2964         | Down Az Gamma Ray |
| SLPU 44-32H                |                | AzGRu      |                         |                 |                     |       |              |                   |
| SLPU 42-16H                |                | AzGRu      |                         |                 |                     |       |              |                   |
| SLPU                       | 49005615980000 | AZGRU      |                         |                 |                     |       |              |                   |
| SLPU                       | 49005616220000 | AZGRU      |                         |                 |                     |       |              |                   |
| Shawnee State 3269-4-11N-H |                | CGR        |                         |                 |                     |       |              |                   |
| Warbonnet 16A1-11D         | 49035268670000 | ECGR       |                         |                 |                     |       |              |                   |
| Riverside 5C2-2D           | 49035270110000 | ECGR       |                         |                 |                     |       |              |                   |
| WELL                       | UNIQUE WELL ID | ECGR       |                         |                 |                     |       |              |                   |
| Riverside 4A2-2D           |                | ECGR       |                         |                 |                     |       |              |                   |
| Warbonnet 15C2-10D         | 49035269870000 | ECGR       |                         |                 |                     |       |              |                   |
| Riverside 7C1-2D           | 49035270160000 | ECGR       |                         |                 |                     |       |              |                   |
| Riverside 6C2-2D           | 49035270180000 | ECGR       |                         |                 |                     |       |              |                   |
| Riverside 4C2-2D           | 49035270100000 | ECGR       |                         |                 |                     |       |              |                   |
| Riverside 4C2-2D           | 49035270100000 | ECGR       |                         |                 |                     |       |              |                   |
| Warbonnet 9A1-3D           | 49035274350000 | ECGR       |                         |                 |                     |       |              |                   |
| Boulder 13A1-33D           | 4903524915     | ECGR       |                         |                 |                     |       |              |                   |
| Mesa 16C1-35D              | 49035274750000 | ECGR       |                         |                 |                     |       |              |                   |
| RIVERSIDE 3B1-10D          | 4903527371     | ECGR       |                         |                 |                     |       |              |                   |
| Mesa 10D1-35D              | 49035274690000 | ECGR       |                         |                 |                     |       |              |                   |
| Warbonnet 10C1-3D          |                | ECGR       |                         |                 |                     |       |              |                   |
| Mesa 10D2-35D              | 49035274770000 | ECGR       |                         |                 |                     |       |              |                   |

Log Curve Values : /app/LasFiles/561598E.las



**Substandard well log curves**  
 Well log curves which do not match the ML criteria for the curve type.

has 30 distinct values in the curve

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    - Curves with no samples
    - Curves with other errors
    - Duplicate curves
  - ML results
    - Substandard curves**
    - Unclassified curves
    - Mislabelled curves?
    - Single value curves
    - Negative value curves
    - QC OK flagged
  - Charts
    - Dashboard
    - Chart Builder
    - Charts
  - Clean up
  - Maintenance
    - Classifications
    - Unit mapping
  - App log



Status: Retrieved log statistics

### Mislabelled curves?

Row count: 10080 Rows selected: 5 Rows shown: 10080

Excel Export

Drag a column header here to group its column

| Well Name                    | Well UWI       | Curve name | Predicted by curve Name | Predicted by ML | ML score             | QC OK | Sample count | Description                  |
|------------------------------|----------------|------------|-------------------------|-----------------|----------------------|-------|--------------|------------------------------|
| RCU #1B H                    | 49-041-21465   | 10IN_2FT_R | RESISTIVITY             | CONCENTRATION   | 0.3179275095462799   | False | 3021         | Array Induction 2 Foot Resis |
| RCU #1B H                    | 49-041-21465   | 10IN_2FT_R | RESISTIVITY             | CONCENTRATION   | 0.3179275095462799   | False | 3021         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 10IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.9409579634666443   | False | 2916         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 10IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.9409579634666443   | False | 2916         | Array Induction 2 Foot Resis |
| RCU #9BH                     | 49-041-21467   | 10IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.9409579634666443   | False | 2916         | Array Induction 2 Foot Resis |
| MOJAVE FEDERAL 4277 27-44F-H | 49019298470000 | 10IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| SNEESBY 44-9H                | 49-021-20889   | 10IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| SNEESBY 44-9H                | 49-021-20889   | 10IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| RANKIN 32-34-68 A 1H         | 49009291450000 | 10IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| CANYON CREEK 95              | 49-037-28798   | 20IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| CANYON CREEK 96              | 49-037-28802   | 20IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| RCU #1B H                    | 49-041-21465   | 20IN_2FT_R | RESISTIVITY             |                 |                      |       |              |                              |
| RCU #1B H                    | 49-041-21465   | 20IN_2FT_R | RESISTIVITY             | CONCENTRATION   | 0.17546525597572327  | False | 3021         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 20IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.8008965253829956   | False | 2916         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 20IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.8008965253829956   | False | 2916         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 20IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.7419012188911438   | False | 3122         | Array Induction 2 Foot Resis |
| RCU #9BH                     | 49-041-21467   | 20IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.6313557028770447   | False | 8032         | Array Induction 2 Foot Resis |
| SNEESBY 44-9H                | 49-021-20889   | 20IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.6313557028770447   | False | 8032         | Array Induction 2 Foot Resis |
| SNEESBY 44-9H                | 49-021-20889   | 20IN_2FT_R | RESISTIVITY             | PEF             | 0.061412058770656586 | False | 13179        | 3 Array Induction 2 Foot Res |
| RANKIN 32-34-68 A 1H         | 49009291450000 | 20IN_2FT_R | RESISTIVITY             | CONDUCTIVITY    | 0.20520487427711487  | False | 3021         | Array Induction 2 Foot Resis |
| RCU #1B H                    | 49-041-21465   | 30IN_2FT_R | RESISTIVITY             | CONDUCTIVITY    | 0.20520487427711487  | False | 3021         | Array Induction 2 Foot Resis |
| RCU #1B H                    | 49-041-21465   | 30IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.6453685164451599   | False | 2916         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 30IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.6453685164451599   | False | 2916         | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 30IN_2FT_R | RESISTIVITY             | GAMMA RAY       | 0.6453685164451599   | False | 399          | Array Induction 2 Foot Resis |
| RCU #9C H                    | 49-041-21466   | 30IN_2FT_R | RESISTIVITY             | CONDUCTIVITY    | 0.1112268716096878   | False |              |                              |
| FEDERAL C-037870 #18         |                | 30IN 2FT R | RESISTIVITY             |                 |                      |       |              |                              |

**Mislabelled well log curves?**  
 Well Log curves where the ML identifies the data as being something other than the classification based on the curve name.  
 E.g. a BS (Bit Size) curve which has too much sample value variance so the ML identifies it as a HOLE SIZE curve

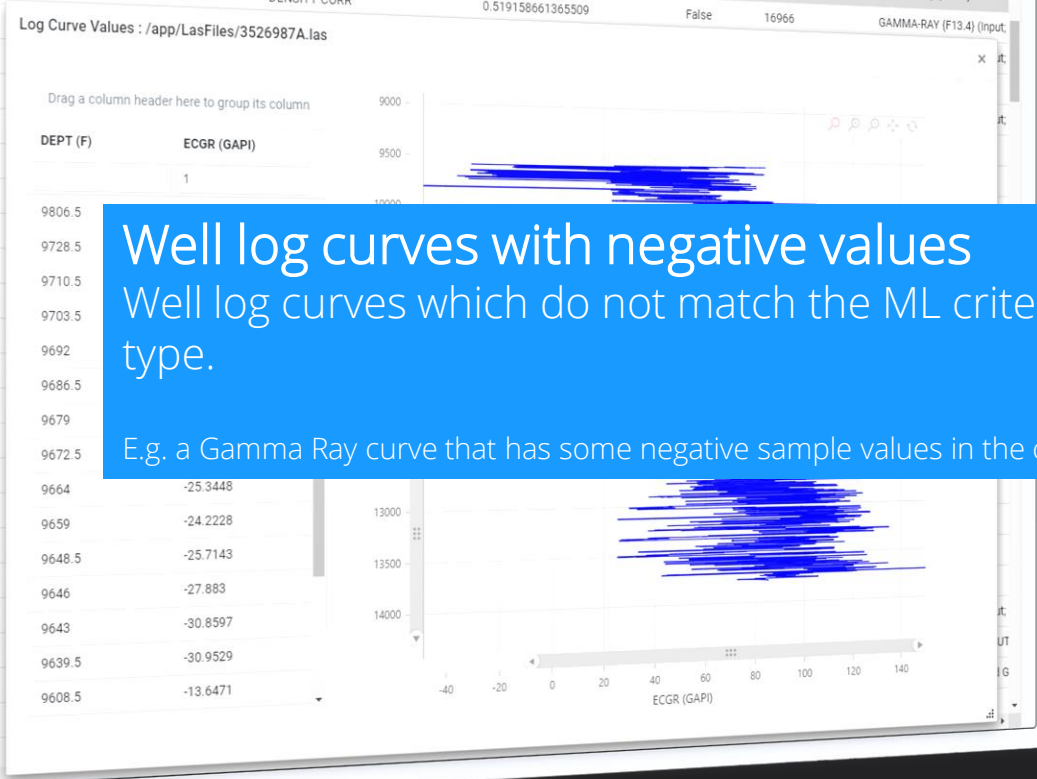
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### Suspect negative value curves

Row count: 7449 Rows selected: 1 Rows shown: 203

Excel Export

| Well Name          | Well UWI        | Curve name | Predicted by curve Name | Predicted by ML | ML score           | QC OK | Sample count | Description              |
|--------------------|-----------------|------------|-------------------------|-----------------|--------------------|-------|--------------|--------------------------|
| Warbonnet 15C2-10D | 49035269870000  | gr         |                         |                 |                    |       |              |                          |
| Riverside 7C1-2D   | 49035270160000  | ECGR       | GAMMA RAY               | GAMMA RAY       | 0.4996057152748108 | False | 8448         | Gamma-Ray (F13.4)        |
| Riverside 6C2-2D   | 49035270180000  | ECGR       | GAMMA RAY               | DENSITY CORR    | 0.519158661365509  | False | 16966        | GAMMA-RAY (F13.4) (Input |
| Riverside 4C2-2D   | 49035270100000  | ECGR       |                         |                 |                    |       |              |                          |
| Riverside 4C2-2D   | 49035270100000  | ECGR       |                         |                 |                    |       |              |                          |
| Warbonnet 9A1-3D   | 49035274350000  | ECGR       |                         |                 |                    |       |              |                          |
| Boulder 13A1-33D   | 4903524915      | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 16C1-35D      | 49035274750000  | ECGR       |                         |                 |                    |       |              |                          |
| RIVERSIDE 3B1-10D  | 4903527371      | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 10D1-35D      | 49035274690000  | ECGR       |                         |                 |                    |       |              |                          |
| Warbonnet 10C1-3D  | 49035274770000  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 10D2-35D      | 49035274770000  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 10D1-35D      | 49035274690000  | ECGR       |                         |                 |                    |       |              |                          |
| Riverside 3B2-10D  | 49035274770000  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 10D2-35D      | 49035274770000  | ECGR       |                         |                 |                    |       |              |                          |
| Warbonnet 10D1-3D  | 49035274410000  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 9B2-35D       | 49035274700000  | ECGR       |                         |                 |                    |       |              |                          |
| Warbonnet 16B1-3D  | 49035274420000  | ECGR       |                         |                 |                    |       |              |                          |
| Warbonnet 2C2-3D   | 490358743410000 | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 15C2-35D      | 49035274780000  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 15A1-35D      | 49035274790000  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 16D1-35D      | 49035274740000  | ECGR       |                         |                 |                    |       |              |                          |
| WELL               | UNIQUE WELL ID  | ECGR       |                         |                 |                    |       |              |                          |
| Mesa 16C1-35D      | 49035274750000  | ECGR       |                         |                 |                    |       |              |                          |

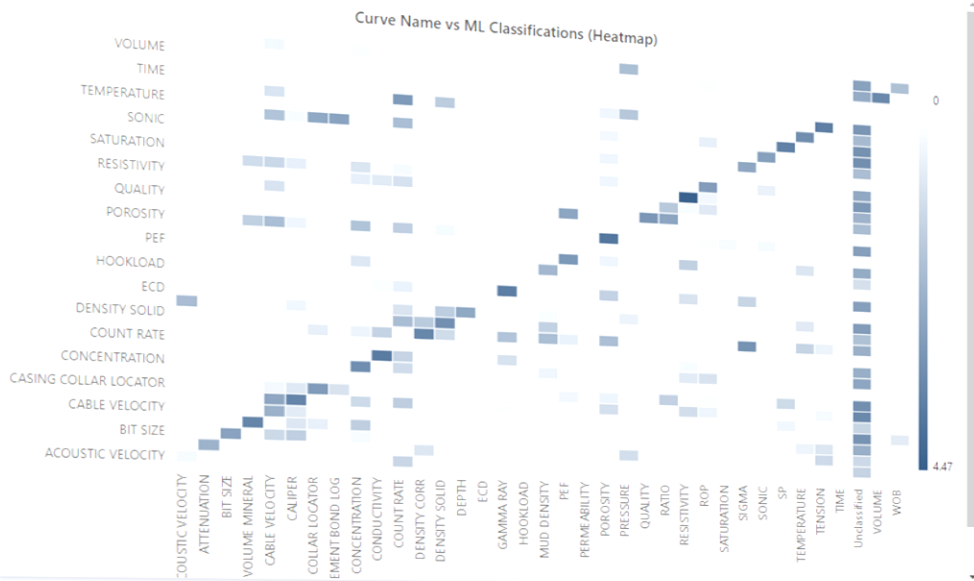


Well log curves with negative values  
 Well log curves which do not match the ML criteria for the curve type.  
 E.g. a Gamma Ray curve that has some negative sample values in the curve

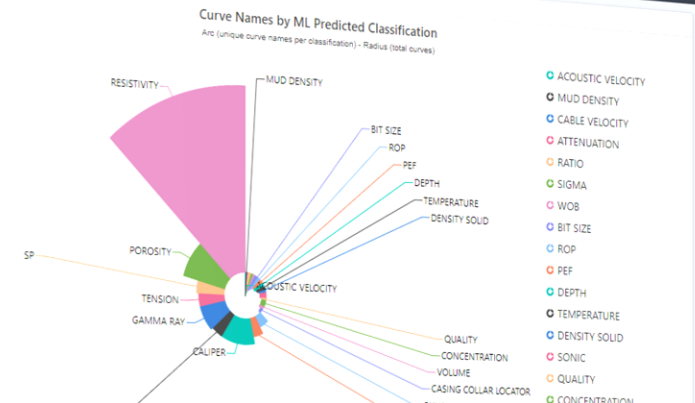
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Heatmap

Download Confusion Plot



Classifications



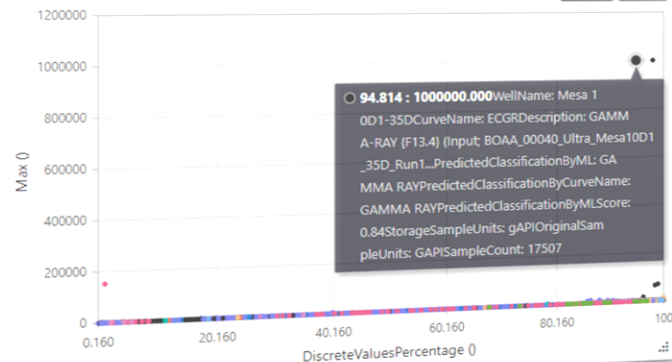
Dashboard for visual inspection & analysis  
 Can be configured to show whatever charts needed  
 E.g. Confusion Plot with heat signature, Min Max, normalized Min Max, etc..

Curve Classification Statistics

Discrete Values Percentage vs Max

PredictedClassificationByCurveName: GAMMA RAY  
6800 filtered log statistics, 39 groups

Grouped by CurveName

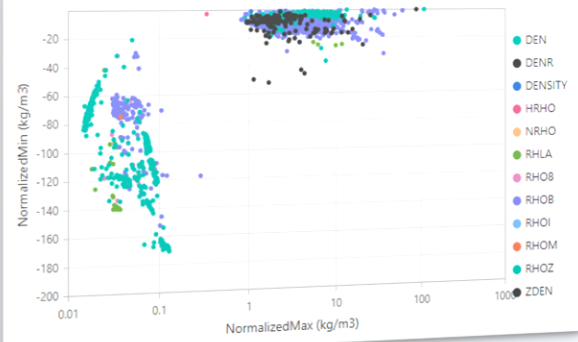


Curve Classification Statistics

Normalized Max vs Normalized Min

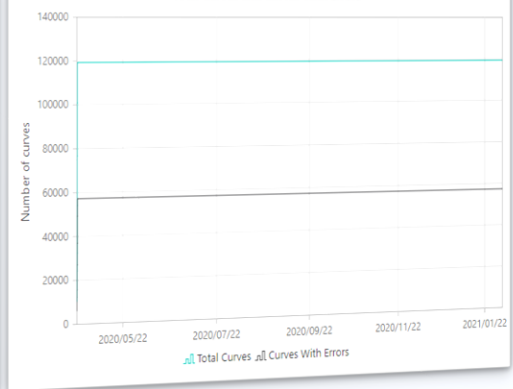
PredictedClassificationByCurveName: DENSITY SOLID  
2412 filtered log statistics, 12 groups

Grouped by CurveName



Curve Counts Over Time

Total Curves and Curves With Errors



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**X Axis**  
Max

**X Axis Scale**  
Logarithmic

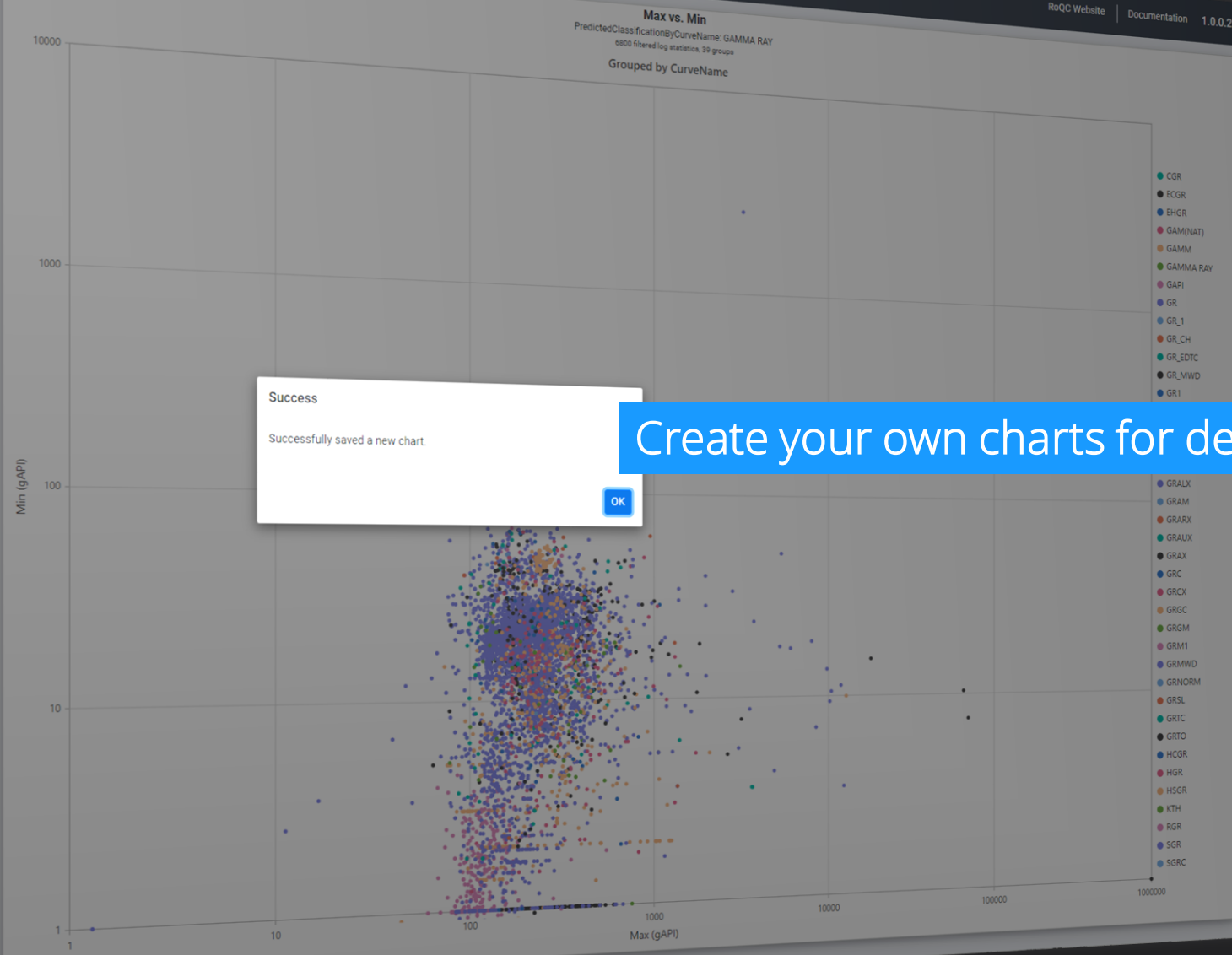
**Y Axis**  
Min

**Y Axis Scale**  
Logarithmic

**Filter**  
GAMMA RAY

**Group by**  
CurveName

Save Chart



Success

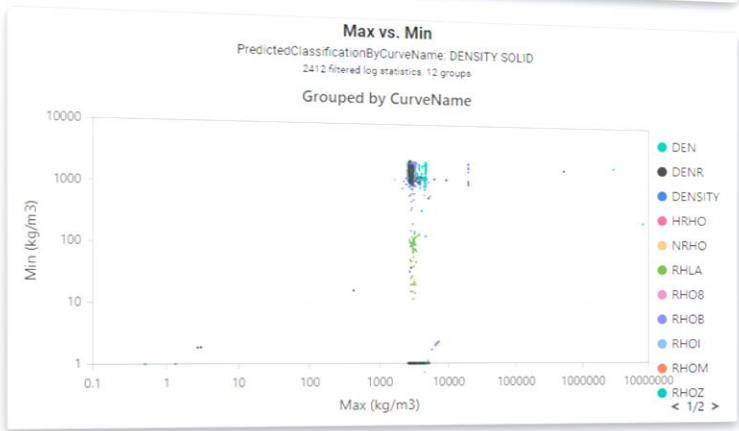
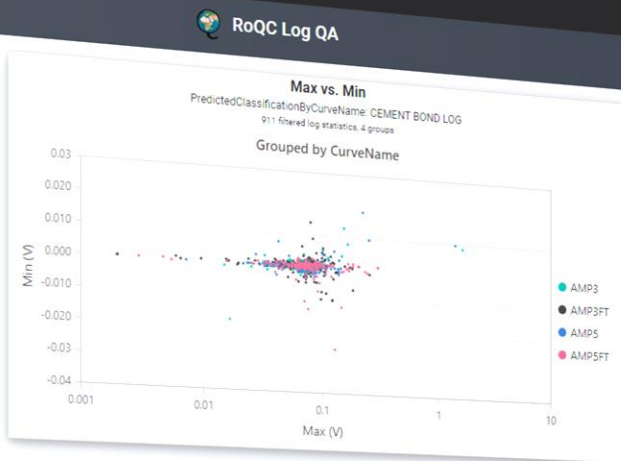
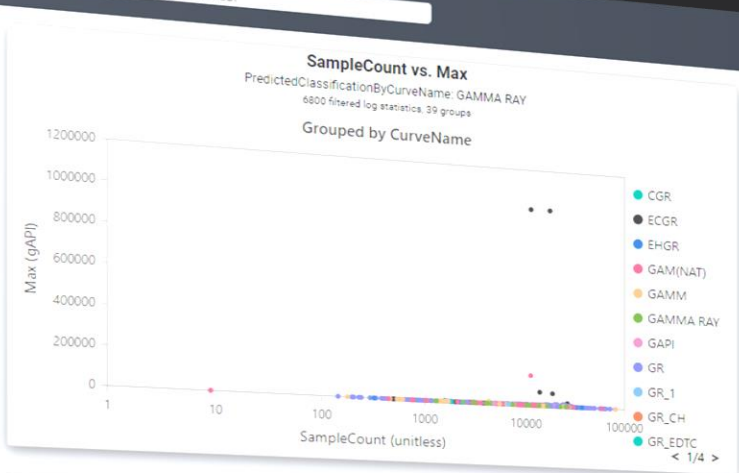
Successfully saved a new chart.

OK

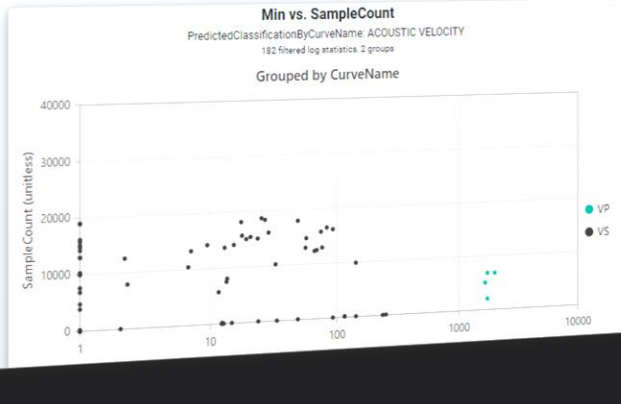
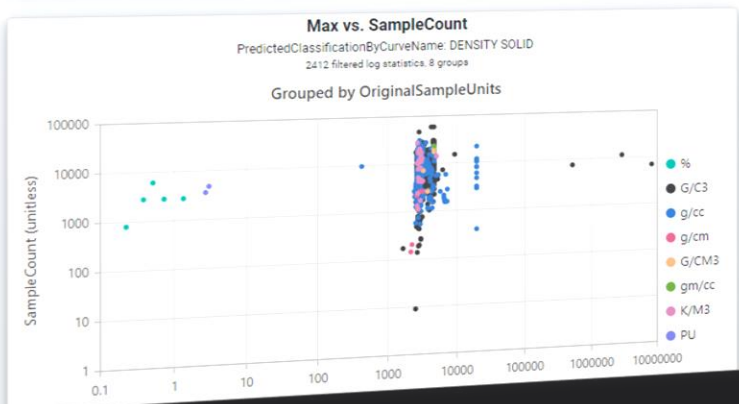
Create your own charts for deeper analysis



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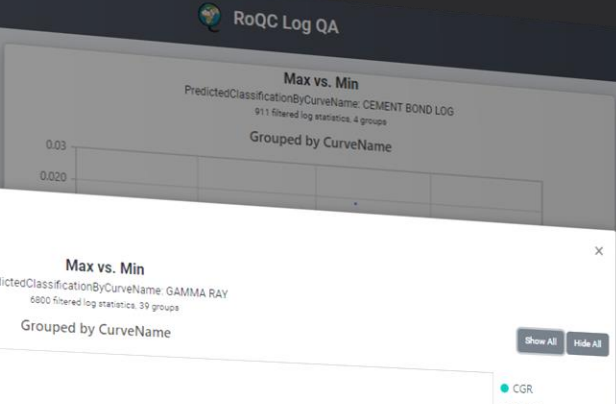
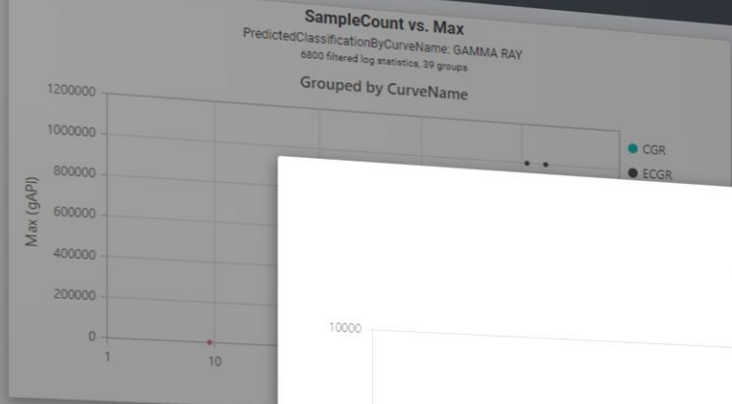


Charts organizer for custom charts

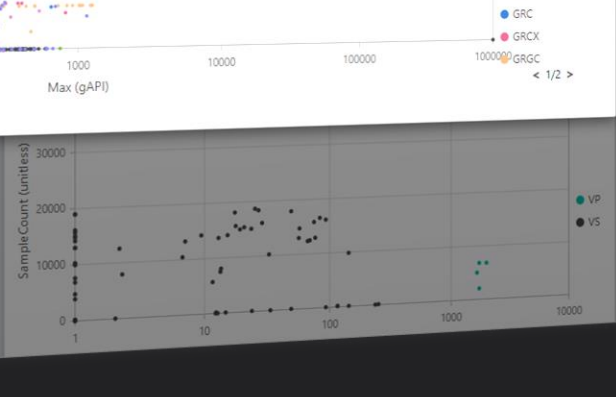
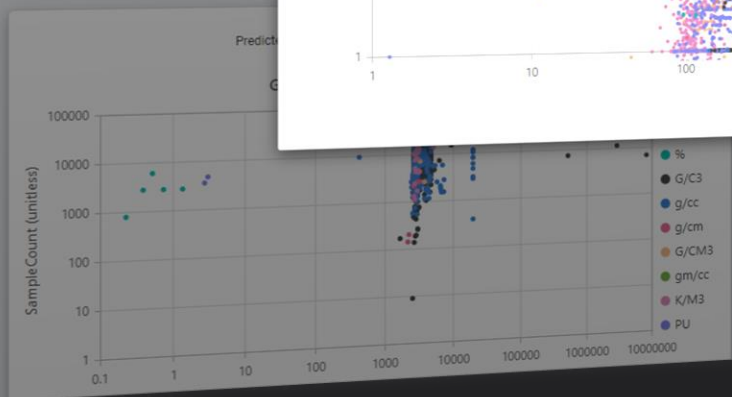


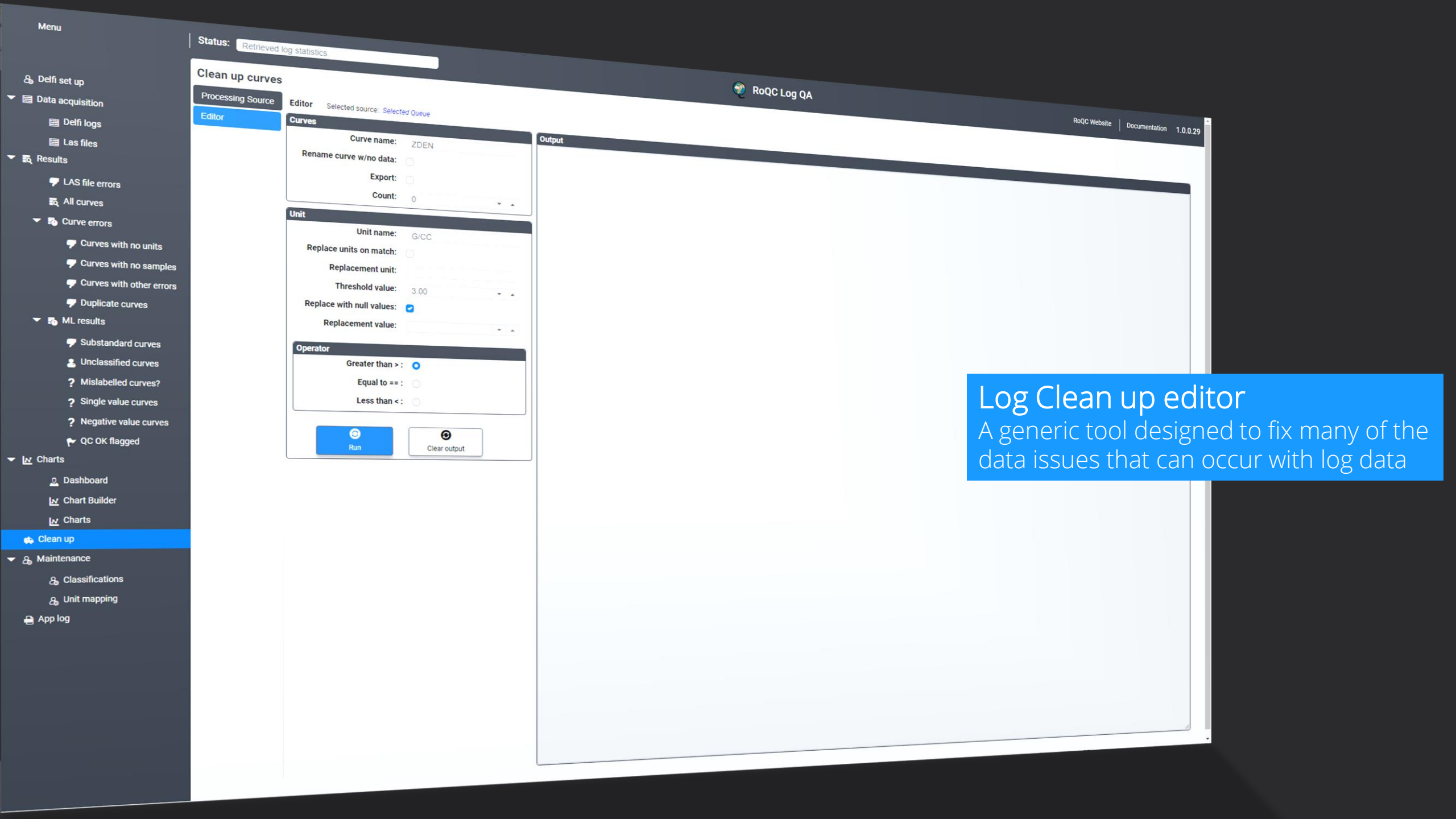


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Quick detailed chart view





Status: Retrieved log statistics

### Clean up curves

Processing Source

Editor Selected source: Selected Queue

Editor

**Curves**

Curve name: ZDEN

Rename curve w/no data:

Export:

Count: 0

**Unit**

Unit name: G/CC

Replace units on match:

Replacement unit:

Threshold value: 3.00

Replace with null values:

Replacement value:

**Operator**

Greater than >:

Equal to ==:

Less than <:

Run

Clear output

**Output**

[Empty area for displaying results]

**Log Clean up editor**  
A generic tool designed to fix many of the data issues that can occur with log data

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Nothing is saved yet!

+ Add Edit Delete Cancel Update

| Unit Name | Description                          | Scale              | Offset  | Storage Unit |
|-----------|--------------------------------------|--------------------|---------|--------------|
| MM        |                                      |                    |         |              |
| MRAY      | milimho                              |                    |         |              |
| ohm.      | megarayl                             | 1                  | 0       | mS           |
| PPK       | 2 AIT H Two Foot Resistivity A10     | 1                  | 0       | MPa.s/m      |
| PSI       | part per thousand                    | 1                  | 0       | ohm          |
| B/C3      | pound per square inch                | 1000               | 0       | ppm          |
| CPS       | count per second                     | 1                  | 0       | kPa          |
| CTS       | dimensionless                        | 1                  | 0       | B/C3         |
| DB        | decibel                              | 1                  | 0       | 1/s          |
| ft3/      | 9 Thermal Decay Porosity             | 1                  | 0       | 1/s          |
| KLB       | thousand pounds mass                 | 1                  | 0       | dB           |
| M/FT      | Rate of Penetration / Drill Time     |                    |         |              |
| BWPD      | Surface Water Flowrate               | 1                  | 0       | BBLS/D       |
| MIN/FEET  | 2 RATE OF PENETRATION                | 0.00508            | 0       | m/s          |
| CFCF      | cubic foot per cubic foot in decimal | 1                  | 0       | ratio        |
| MIN/FT    | minute per foot                      | 0.00508            | 0       | m/s          |
| degF      | degree fahrenheit                    | 0.555555555555556  | 255.372 | kelvin       |
| MINUTES   | minute                               | 60                 | 0       | s            |
| FT/SEC    |                                      | 0.3048             | 0       | m/s          |
| K/M3      | kilogram per cubic meter             | 1                  | 0       | kg/m3        |
| Mrayls    | Minimum Impedance                    | 1                  | 0       | MPa.s/m      |
| MF/D      | GAS FLOWRATE AT STD. COND.           | 0.0196644767999998 | 0       | m3/s         |
| MINPERFT  | DRILL RATE                           | 0.00508            | 0       | m/s          |
| mmho/m    | millimho per meter                   | 1                  | 0       | mS/m         |
| mmo/m     | 90in Conductivity 4ft Res            | 119.826420479462   | 0       | kg/m3        |
| ppg       | pound per gallon                     | 1                  | 0       | ratio        |
| NONE      | unitless                             | 1                  | 0       | V            |
| Volt      | volt                                 | 1                  | 0       |              |

Manage log curves classifications &amp; unit mappings

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Substandard curves

Unclassified curves

Mislabelled curves?

Single value curves

Negative value curves

QC OK flagged

Charts

Dashboard

Chart Builder

Charts

Clean up

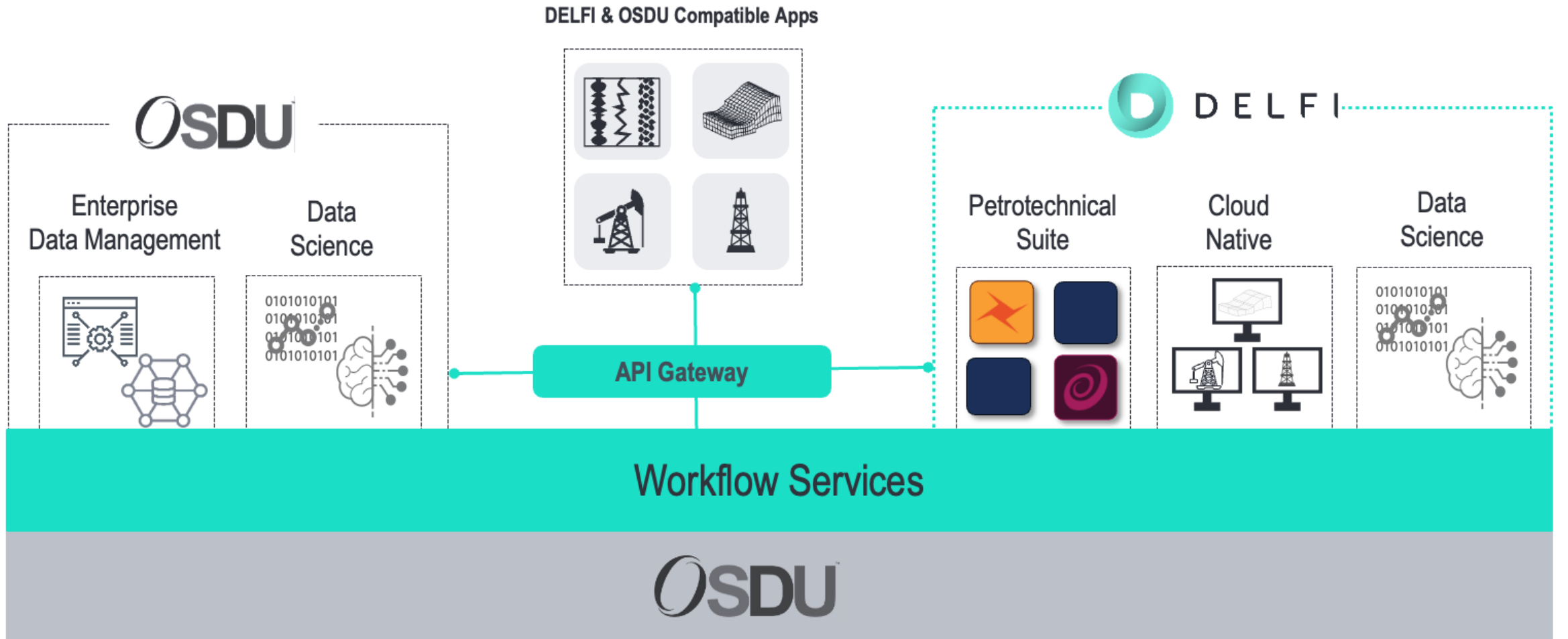
Maintenance

Classifications

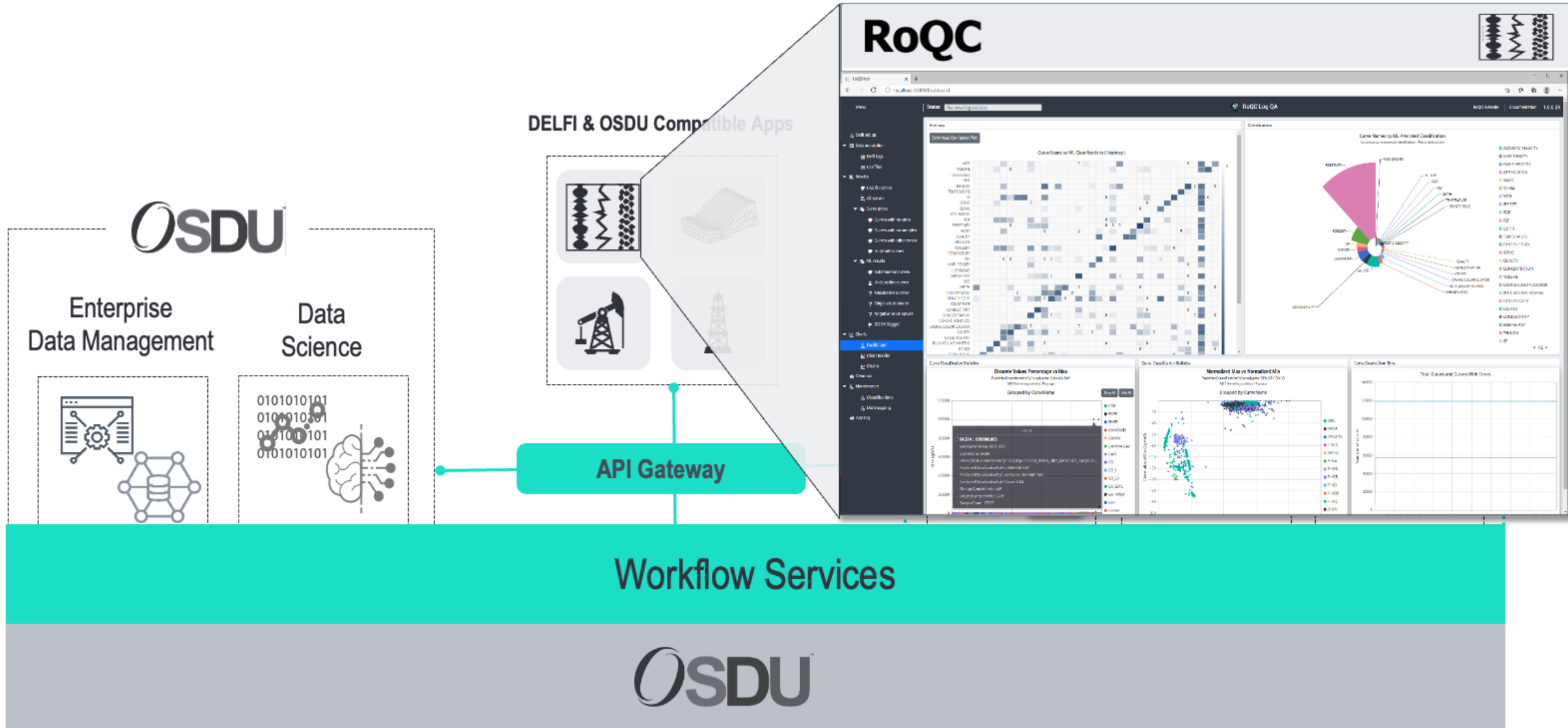
Unit mapping

App log

# DELFI and the OSDU Data Platform



# RoQC LogQA

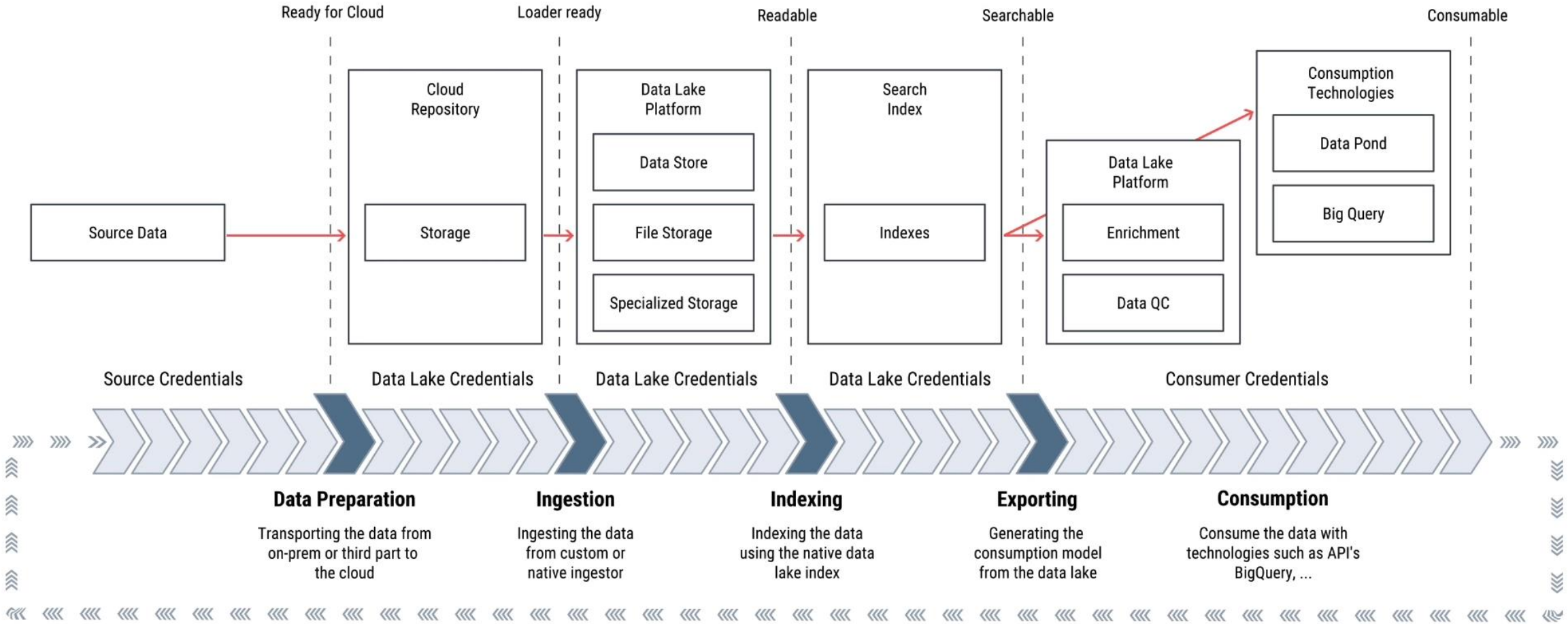


## Workflow Services





# DATA FLOW



# DATA FLOW

