PRESERVING ORIGINAL DATA VALUES

Andy's 'Andy Tips - No. 27

One of the primary goals in recording and assembling data is (or should be) to preserve where possible the original observation, log or measurement data, so it can be reconciled back to related original documents, thereby providing a clear audit trail

While this approach relates to almost all data collected, two common examples are the recording of drillhole logging depths, and original analysis or assay results.

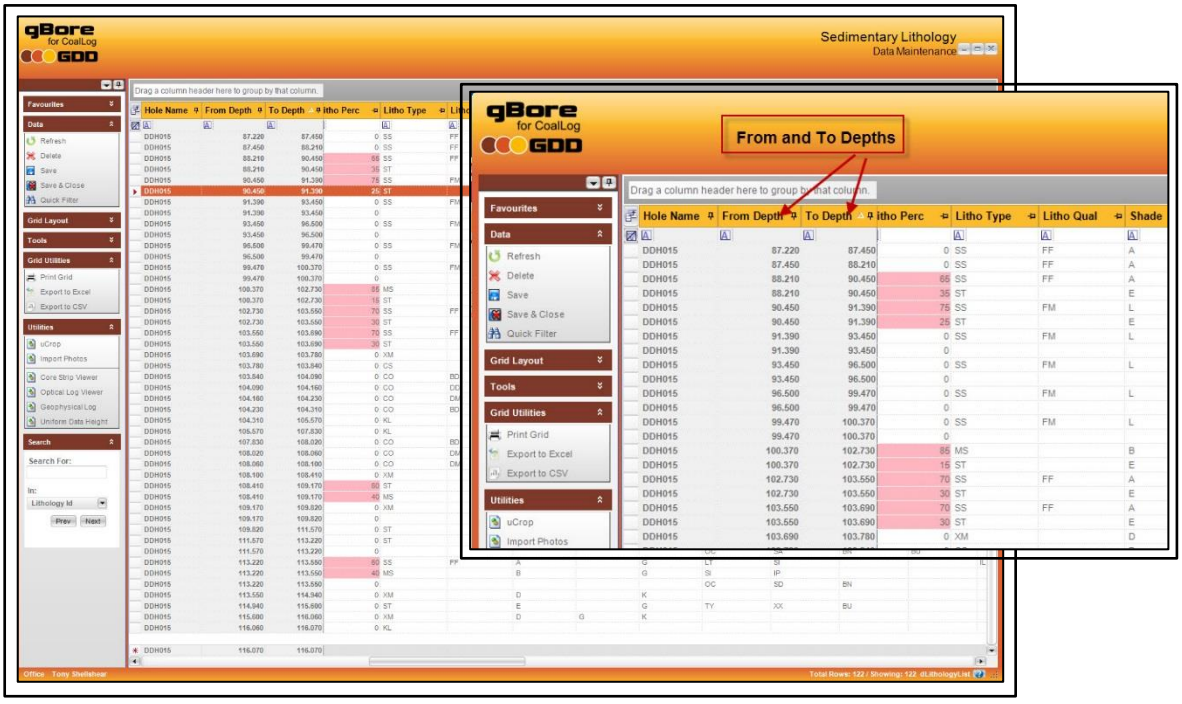
The following examples present the problem and show how it can be addressed in the geological database.

DRILLHOLE LOGGING DEPTHS

Traditionally drillhole data has been stored with a single pair of 'From-To' depth columns, be it in a spreadsheet or database.

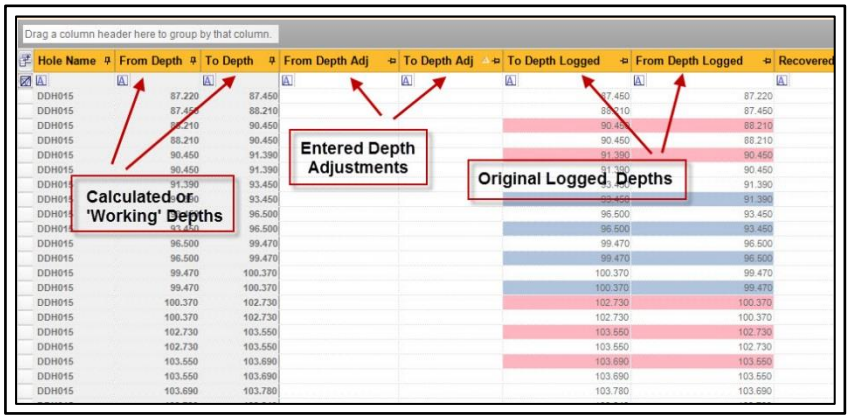
While the original as-logged depths will have been entered initially, general practice has been to overwrite these depth values to reflect any depth corrections or other adjustments. Which means it no longer reflects the values on the logging sheet.

Later interpretation efforts then are more tenuous if the geologist detects a difference against the original logs. Correction? Typo? Wishful thinking?

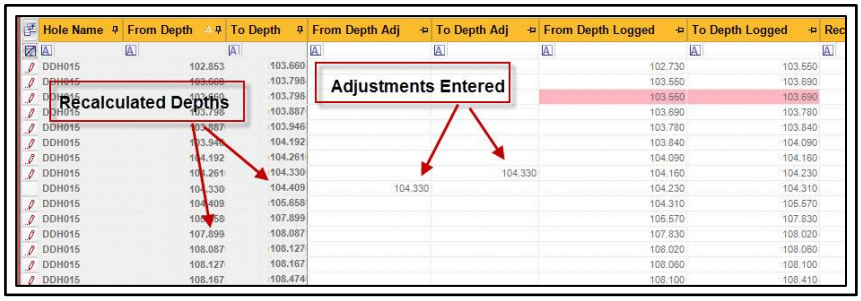


More recently, some database systems make provision to retain the original as-logged depths. Systems such as gPick add two additional pairs of from-to depth columns –

- A **depth adjustment pair**, in which the corrected depth is added to the From or To Depth Adjustment, thus providing documentation as to what values were assigned to rejig the downhole depths based on geophysical log comparisons or surveyed collar and related measurements.
  These are added only at the point of the depth adjustment determination, not on every record.



- A **calculated / adjusted / working depth pair**. When a depth adjustment value is entered as above, the database recalculates the working depth values above and below the corrected record using pro-rat differences until it encounters the top or bottom of the hole, or another depth correction, which must be honoured.



The result is thus three sets of depth columns, reflecting –

- The original as-logged depths, which will match the original logs
- The individual correction values used to adjust the record depths
- The recalculated interval depths which will be used by the modelling, reporting and display tools during the interpretation and evaluation exercise.

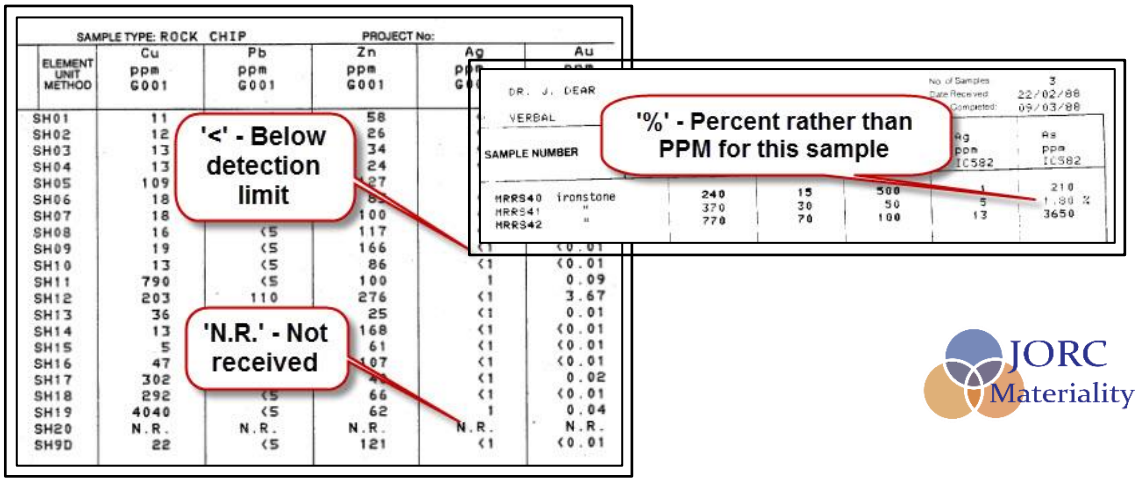
ASSAY RESULTS

Assay results are normally reported as a numerical value; except when other factors prevent the accurate determination of that value. This may be due to a variety circumstances, but commonly include –

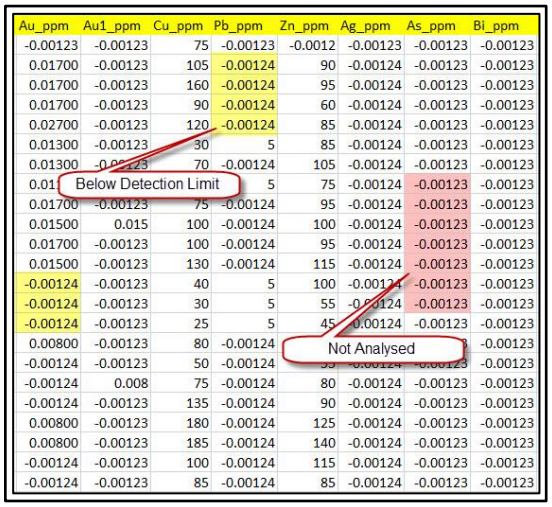
- The sample was not analysed (not requested) for a particular element or property.

- The analysis was requested, but the sample went AWOL, and was thus reported as missing in the analytical report
- There was insufficient sample material to facilitate the analysis.
- The concentration of the element or property was below the detection limit of the equipment or process being employed.
- Or, less commonly, above the detection limit range.

Analytical results as reported by the labs will contain the results for those assays that were successful, but also a variety of non-numeric characters indicating the status and reason for analyses that could not be performed satisfactorily



Databases, and the majority of evaluation systems, expect assays to have numerical values with which to work, and given a strange alpha character, will general spit the dummy….



So a common practice has been to replace the meaningful lab reported character-based values with archane negative values, each assigned to mean something. The problem is that you don't have an easy means to determine that meaning, and worse, any statistical or other mathematical procedure run on the numbers will be biased unless these spurious values are first removed.

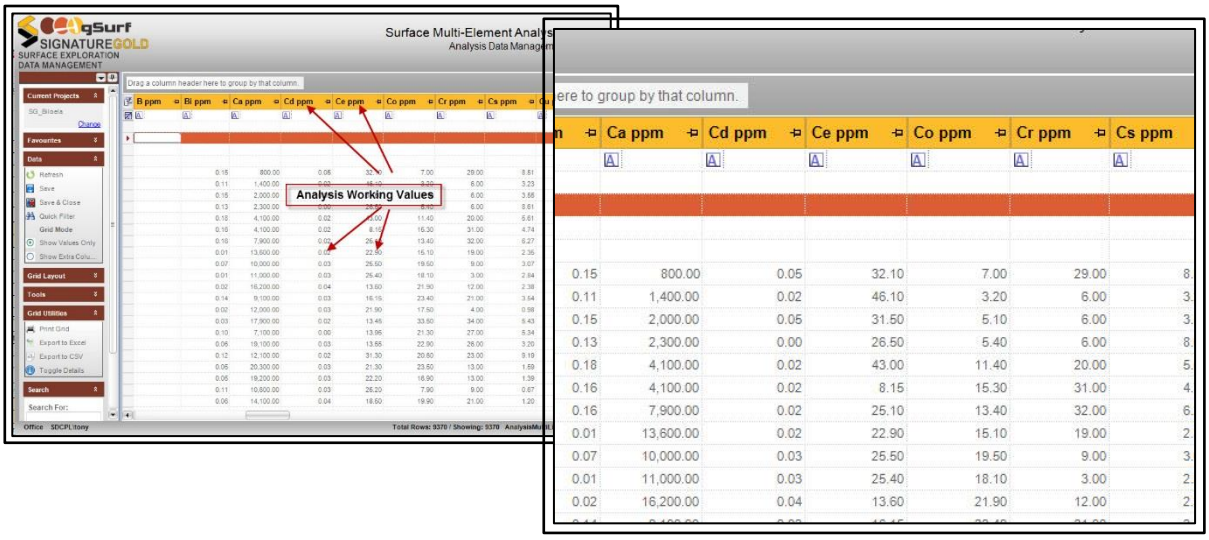
Another common method of dealing with the 'below detection limit' values is to put them in as a value of half the detection limit for that analyte and analytical method. Which is not entirely unreasonable but it means that no ready identification of these 'BDL' assays remains in the data.

So, are there better ways of storing this analytical data and its related metadata?

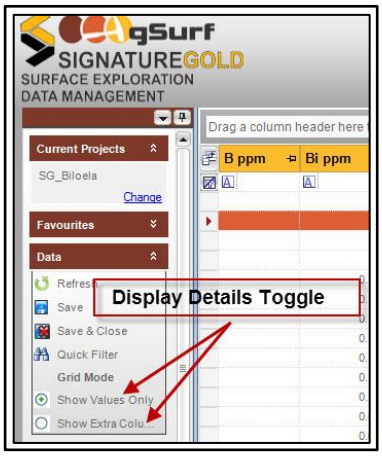
The system employed in the gPick system, as an example, does a similar 'smoke and mirrors' thing with the actual analytical results so that only numerical values appear in the assay values loaded. In summary, -

- Assays flagged as not received or insufficient sample are simply left blank (null)
- Values below detection limit are pumped in at half the detection limit, or another value, or null, as dictated by the relevant resource geologist.

So the data looks nice and neat, and can be processed with prestidigitators numerical.



But what of our audit-trail, and the ability to identify the reasons for the blank spaces?



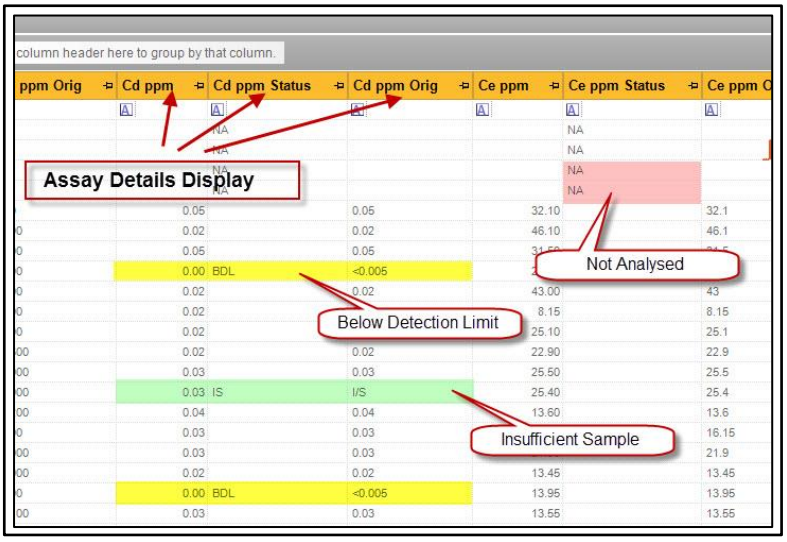
In the side menu of the assay forms are two radio buttons. By default just the numerical 'working' assay values are displayed.

Selecting the other button expands the display; for every analyte two additional columns are displayed –

- A status column, with codes indicating the analysis status for that element for that sample.
- An original assay value, displaying the reported result value as it appeared on the original lab result sheet or certificate.

Important ! –

Ensuring your database system allows you to preserve an audit trail greatly speeds up independent reviews, resource estimation documentation and the preparation of the JORC ‘Table 1’ compliance requirements



Please feel free to give me a whistle if you have any comments or questions.

All the best!

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