



Data Validation

More than thirty geological rules applied to collars, surveys, intervals, recovery and structures — with severity, assisted correction and a reversible history.

- Group: Analysis
- Background execution
- 4 tabs · 30+ rules
- Reusable validation profiles

DB Alteration

Interval Table

DB

Mapping to the actual columns in your DB table.

HoleID

mFrom

mTo

Select --

Select None

Interval

Core Interval

Length Interval

Below Minimum Length

min m

Executive summary

Data Validation runs more than thirty geological rules over collars, surveys, intervals, recovery and structures, and returns findings ranked by severity — CRITICAL, HIGH, MEDIUM — exportable as they stand into a quality file.

01 What it replaces

Cross-sorting in a spreadsheet, hand-reading depths, and discovering a duplicate identifier at estimation time.

02 How it works

You point at the source, assign it a table category, map the key columns, tick the rules and run. The engine works in a background thread; the result is colour-coded by severity.

03 Who it is for

The database geologist before every delivery, and the auditor who asks for proof that the dataset was checked — and against which criteria.

30+

hard-wired geological rules

5

table categories checked

4

severity levels

26 377

samples submitted to the engine

Scope measured on the KOUKOUDAN project database.

Contents

01 The problem

A drillhole database is only usable once it has been proven.

02 Six table categories

Collar, survey, interval, recovery, structure, plus the rules common to all.

03 The four severity levels

Critical, high, medium, pass — colour-coded.

04 Rule parameters

Minimum length, survey deltas, UTM zone, location tolerance.

05 Validation profiles

Save, load, import and export a whole configuration.

06 Correction and history

Assisted auto-correction and a reversible log of replaced values.

07 Anonymised data

805 collars, 5,645 survey stations, 198,335 intervals checked.

08 Business value

An auditable database, ready for a compliance report.



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SECTION I

The module

The problem addressed, the capabilities delivered, the processing chain and the module's place in the platform.

-
- 01 Context
 - 02 Key capabilities
 - 03 Processing chain
 - 04 Place in the platform
-

Context

An external audit, a resource estimate or a transaction never starts with the geology: it starts with the question “does this database hold up?”.

The validation engine answers in writing, rule by rule, row by row, with a severity level and an export you can act on.

Checking is configurable, not fixed

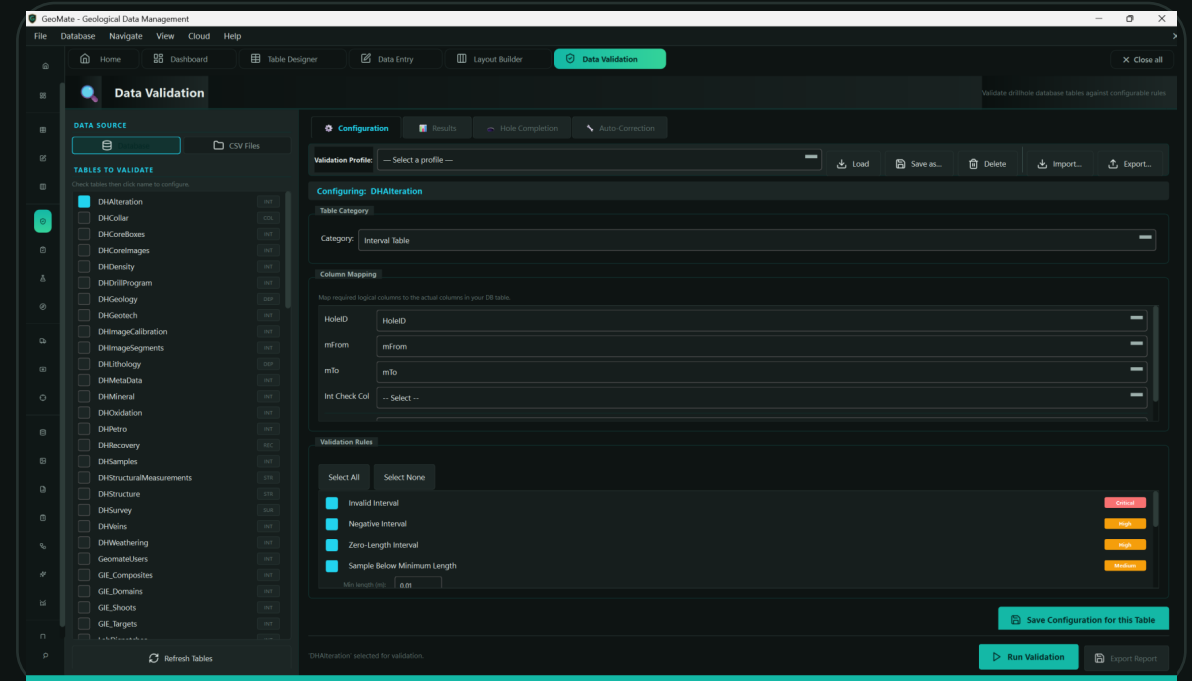
Minimum sample length, maximum dip or azimuth change per station, maximum spacing, UTM zone and hemisphere: every threshold is adjustable.

Two possible sources

A database table or an external CSV file — useful to check a delivery before importing it.

Nothing is corrected without a trace

The Correction History tab keeps every replaced value and allows a rollback.



Validation runs on a separate thread: on a large dataset the interface stays usable and the status bar shows progress.

Key capabilities



01

Six rule families

Collar, survey, interval, recovery, structure, plus the common checks applied to any table.



02

Graded severity

Critical in red, high in orange, medium in yellow, pass in green — the order of work reads itself.



03

Adjustable thresholds

Minimum length, per-station Δ dip and Δ azimuth, first survey depth, spacing, UTM zone, elevation range, duplicate-location tolerance.



04

Reusable profiles

Load, save, import, export: the checking configuration travels between projects and between companies.



05

Auto-correction

A dedicated tab proposes fixes for mechanical defects — stray spaces, casing, invisible characters — under operator control.



06

Reversible history

Every value replaced by a correction or an import is logged and can be restored (Ctrl+5).

Processing chain

From the raw table to a ranked finding, exportable into the quality file.

A Inputs

Database table or CSV file

- Table category: collar, survey, interval, recovery, structure
- Mapping: HoleID, mFrom, mTo and key columns
- Reference lists of expected codes
- Parameters: minimum length, maximum deltas, UTM zone
- Selection of the rules to apply

B Checking

Rule engine, on a background thread

- Collar: duplicates, special characters, UTM range, dates
- Survey: dip and azimuth, spacing, under-surveyed holes
- Interval: gaps, overlaps, negative lengths, duplicates
- Recovery: out-of-range RQD and recovery, RQD > recovery
- Every table: required value missing, invisible characters, code not in the reference list

C Outputs

An actionable finding

- Results colour-coded by severity in the right panel
- Excel, CSV or TXT export for the quality file
- A list of corrections to carry back into Data Entry
- A record of the parameters applied during the check
- A clean database, ready for estimation and reporting

WHAT SEVERITY MEANS

CRITICAL: integrity failure, to be fixed before any use. HIGH: significant issue, strongly recommended to fix. MEDIUM: worth reviewing. PASS: rule passed with no finding. The ranking is there to order the correction work, not to excuse what goes uncorrected.

Validation runs on a separate thread: on a large dataset the status bar shows progress and the interface stays usable.

Place in the platform

FED BY

03 Data Entry

Supplies the tables to check, straight after the capture session.

02 Table Designer

Declares the constraints — required, type, unique — that the rules check.

12 External Data

Third-party datasets are the ones that most warrant a systematic pass.



Data Validation

The control point: it corrects nothing, it reports — and gives the correction work a defensible order of priority.

FEEDS

15 Audit Report Builder

The findings and their parameters feed the signed audit file.

11 Assay Intercept

An intercept computed over overlapping intervals is worthless: validation comes first.

17 Geological Intelligence

Estimation assumes a database with no duplicate collar and no under-surveyed hole.

Validation is read-only: correction happens in Data Entry, then the check is run again. That cycle is the normal procedure.



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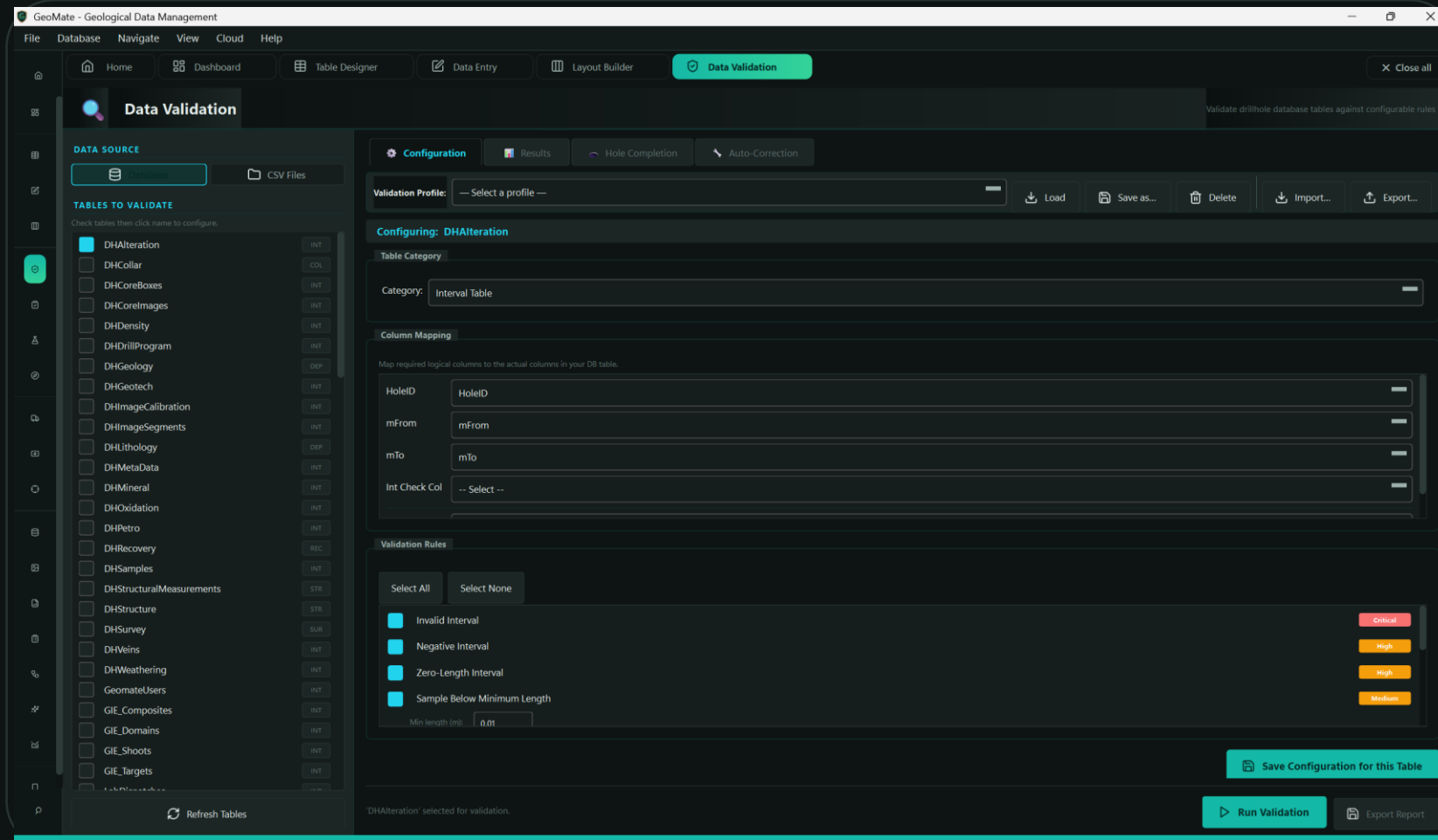
SECTION II

In practice

The real interface, the operating workflow, the reference settings, good practice and the questions that come up.

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- 01 The interface
 - 02 Operating workflow
 - 03 In depth
 - 04 Good practice
 - 05 Frequently asked
-

The interface



1 Data source

Database or CSV files — pre-import checking is possible.

2 Tables to validate

Each table carries its category: INT, COL, SUR, REC, STR, DEP.

3 Validation profile

Load, save as, delete, import, export the configuration.

4 Column mapping

Map HoleID, mFrom, mTo and the check columns onto the real fields.

5 Rules and severity

One checkbox per rule, with its severity chip and associated parameter.

Actual GeoMate 2026 v2026.3.1.5 screen capture — Midnight theme.

Operating workflow

Five steps, only one of which is repeated each campaign.

1

Pick the source

Database table or CSV file, then assign the category: collar, survey, interval...

2

Map the columns

HoleID, mFrom, mTo and the check columns are mapped onto the table's real fields.

3

Select the rules

Tick the relevant rules and adjust their thresholds; save the whole thing as a profile.

4

Run

Validation runs in the background; results appear colour-coded in the right panel.

5

Correct and export

Assisted auto-correction for mechanical defects, Excel / CSV / TXT export for the QA report.

Rules by table category

CATEGORY	PRINCIPAL RULES
Collar	Duplicate HoleID · null HoleID · special characters · UTM range · duplicate location · negative or future drill date · cross-table HoleID · hole with no survey
Survey	Invalid dip or azimuth · continuous direction change · duplicate station · first survey too deep · excessive spacing · under-surveyed hole
Interval	Invalid, overlapping or gapped interval · negative length · non-numeric depth · duplicate sample · null value · missing HoleID
Recovery	Invalid RQD or recovery · RQD greater than recovery · zero recovery · overlapping or gapped intervals
Structure	Invalid alpha, beta, dip or direction · ambiguous direction · depth monotonicity · duplicate measurement
Every table	Required value missing · padded or invisible characters · code not in the reference list · date before the hole start date

Severity and parameters

SEVERITY	COLOUR	MEANING	EXPECTED ACTION
CRITICAL	Red	Data integrity failure	Must be corrected
HIGH	Orange	Significant issue	Strongly recommended to fix
MEDIUM	Yellow	Minor issue	Review recommended
PASS	Green	Rule passed with no issue	None

Configurable parameters: minimum sample length (m), maximum per-station Δ dip and Δ azimuth ($^{\circ}$), maximum first-survey depth (m), maximum spacing (m), UTM zone and hemisphere, elevation range (m), location tolerance (m) on Easting/Northing and RL.

Good practice

The checking procedure before a dataset is delivered.

✓ Assign the right category

Collar, survey, interval, recovery or structure: the category decides which rules apply. Assigned wrongly, it lets rules go unrun.

✓ Map every key column

HoleID, mFrom, mTo at a minimum. An unmapped column silently disables the rules that depend on it.

✓ Set the parameters to the campaign

Minimum sample length, maximum dip and azimuth deltas, station spacing, UTM zone, elevation range, location tolerance.

✓ Deal with CRITICALs first

An integrity failure makes everything computed after it wrong. The rest can wait for the next cycle; these cannot.

✓ Export the finding, not just fix it

The dated export is the proof that the check took place and against which criteria. That is what an audit asks for.

✓ Re-run after correction

One correction can reveal another — closing a gap sometimes creates an overlap. The check closes when a pass returns nothing.

Frequently asked

What comes up in front of a findings table.

Q Does the module fix the data?

No. It reports and ranks. Correction happens in Data Entry; that is what guarantees nothing is changed unintentionally.

Q Why does a rule return nothing?

Either it passes, or the column it depends on is not mapped. Check the mapping before concluding the dataset is clean.

Q What does “code not in reference list” mean?

The captured value does not exist in the expected list for that field. Typically a case variant or a typo.

Q “Padded or invisible characters” — what is that?

Spaces or non-printing characters around a value. Invisible on screen, they break joins and reconciliations.

Q Can I check a CSV rather than the database?

Yes. The module takes a database table or a CSV file: that is how you check a delivery before importing it.

Q How long on a large dataset?

Seconds to tens of seconds. Processing runs in the background and progress is shown in the status bar.



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SECTION III

The data

What the module produces on a real dataset, and the vocabulary needed to read those results.

01 Anonymised data

02 Key concepts

Anonymised data

The scope actually submitted to the validation engine on the KOUKOUDAN database.

805

COLLARS

duplicate, UTM range, date and cross-table HoleID rules

5 645

SURVEY STATIONS

dip, azimuth, spacing, first survey

198 335

LOGGED INTERVALS

overlap, gap, length, reference code

26 377

SAMPLES

duplicates, null values, missing HoleID

More than 260,000 records go through the thirty rules in a single background run. Every anomaly comes out with its row, its rule and its severity level — then leaves as an Excel, CSV or text report for the QA review.

Source: KOUKOUDAN project database (Senegal) — figures computed from the real data exported from GeoMate.

Key concepts

The quality-control notions the engine uses.

Severity

A finding's ranking: CRITICAL, HIGH, MEDIUM or PASS. It orders the correction; it does not replace it.

Continuous direction change

A steady drift of dip or azimuth from one station to the next, the signature of a mis-calibrated instrument or an offset capture.

Location tolerance

The distance below which two collars are treated as the same. It is set according to survey precision.

Under-surveyed hole

A hole whose survey stations are too far apart to describe its real trajectory — the position of the samples becomes uncertain.

Duplicate location

Two collars closer together than the chosen tolerance. Often the same hole captured twice under two identifiers.

Depth monotonicity

The rule requiring depths to increase down the hole. Its violation signals an inverted capture.



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SECTION IV

Value & specifications

What the module changes for the project, and its technical integration profile.

01 Business value

02 Technical profile

Business value

The database becomes defensible

A dated, rule-by-rule validation report is what an external auditor or a Qualified Person asks for before signing.

Written proof

Defects are ranked

Four severity levels say where to start: critical gets fixed before cosmetic.

4 levels

Checking precedes the import

A CSV delivery can be validated before it enters the database — the defect never contaminates history.

Pre-write

Correction is reversible

Every replaced value is logged: a badly judged batch of corrections can be undone in full.

Full rollback

The profile transfers

A checking configuration approved by the chief geologist is exported and applied as-is across every project in the group.

Group standard

Technical profile

Inputs

Sources

Database table or CSV file

Categories

Collar · survey · interval · recovery · structure

Mapping

Logical columns onto real columns

Profiles

Saveable, importable, exportable

Execution

Rules

More than 30, individually selectable

Threading

Background thread, non-blocking UI

Tabs

Configuration · Results · Hole Completion · Auto-Correction

Complexity

$O(\text{rows} \times \text{rules})$ — linear

Outputs

Report

Excel (one sheet per table) · CSV · TXT

Detail

Row, rule broken, description of the defect

Correction

Reversible log, reachable with Ctrl+5

Chaining

Triggerable from the Automation Builder



One platform, from field to report

The “Data Validation” module is one of the 19 modules of GeoMate 2026 — a single, fully offline platform covering the whole chain: database design, data entry, validation, QA/QC, dispatch, analysis and reporting.