WRA Bulletin 75

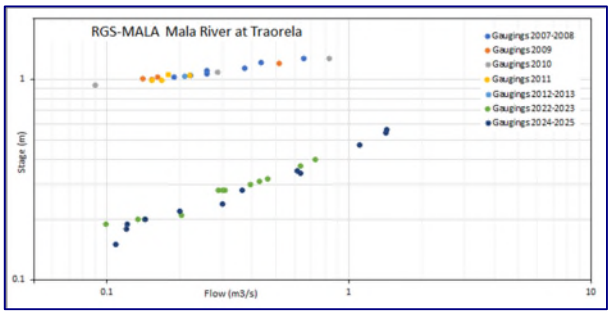
May 2025

INTERNATIONAL WORK

Processing and QAQC of River Data, Guinea

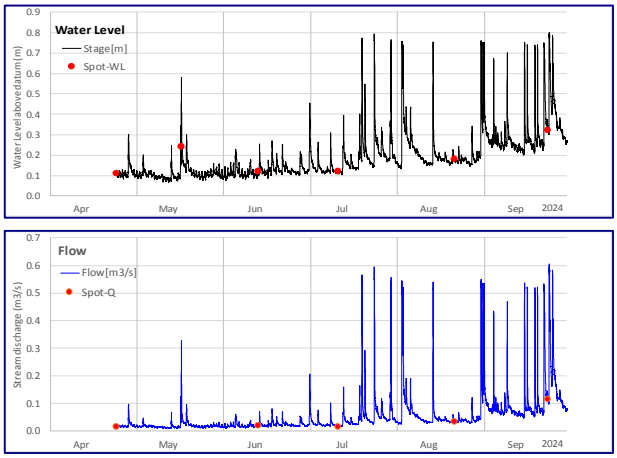
WRA has been working with SRK Consulting on the Rio Tinto-Simfer Iron Ore Project at Simandou in Guinea since 2021. Rio Tinto commissioned SRK and WRA to process and undertake QAQC on river and stream monitoring data recorded at the site during 2023 and 2024. With help from SIMFER's site team, WRA collated and checked all logged data, manually observed water levels and spot streamflow measurements made at over 25 stations, some operating since 2007.

Stage-discharge rating curves generated in previous years were checked and updated, and in some cases completely new curves were generated either because ratings were found to have changed or the location of the station had changed.



Example of review of rating curve data

Non-vented pressure transducers are used at project gauging stations to log stream water levels at 10-minute intervals. Total [water column + atmospheric] pressures were compensated using baro-loggers, converted to water depth and adjusted to observed stage observations on staff gauges to produce water level time series. Rating equations valid between start and end dates were applied to update and extend flow time series.



Example of 10-minute stage and flow hydrographs

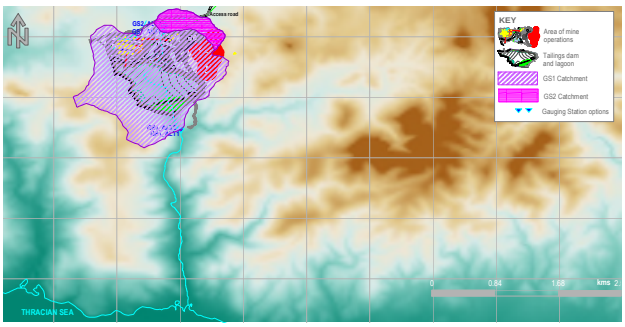
All raw and processed data were stored in the project's hydrometeorological database in which much of the processing took place.

Perama Hill Gold Project, Northern Greece

WRA has been assisting Energies Group in scoping new baseline studies for an update of the EIA of Eldorado Gold's Perama Hill project.

Location of Perama Hill Gold Project

Perama Hill is an epithermal gold-silver deposit hosted within sandstone, conglomerate and andesite of the Petrota graben in NE Greece.



Catchment and Proposed Gauging Points

The proposed mine site is drained by a North-South valley through the coastal hills flowing into the Thracian Sea between Petrota Beach 2.2 km to the west and the town of Paralia Dikelion 4.5 km to the east.

One of the scoping tasks was to recommend locations and types of river gauging stations from a number of options proposed by the client.

GS1 Gauging station on the main stream

UK WORK

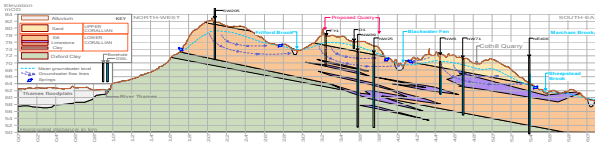
Hydrogeological Appraisal of Blackwater Fen

WRA was recently commissioned by Tubney Action Group to review the impact of proposed quarrying by Hills Quarry Products of Beckley Sand aquifer on a SSSI in South Oxfordshire.

The proposed quarry lies adjacent to Blackwater Fen, a groundwater-fed calcareous wetland of national importance, part of Frilford Heath, Ponds & Fens SSSI. By assessing the fen water balance, WRA showed that proposed quarrying of the Upper Corallian would result in a large loss in fen inflow, leading to long-term depletion of water feeding the SSSI wetland.

Blackwater Brook accretion profiling

Accretion profiling suggested that at least half of the groundwater discharge, which feeds the SSSI fen, is derived from the proposed quarry area.



Geological Cross-Section of Frilford Brk Catchment

Eight piezometers were installed for groundwater and rainfall monitoring which showed rapid recharge of the aquifer following significant rainfall events, and depth-to-groundwater of 1 to 1.7 m bgl at the quarry centre. NE-SW trending lineaments in the fen catchment formed by intercalated limestone have an important impact on groundwater circulation and capture.

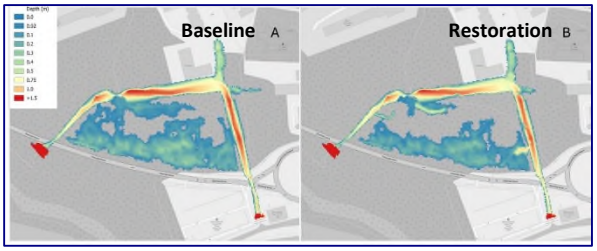
Piezometer D4 in the hammerhead depression

Taylors Cut River Restoration

WRA has been involved in the restoration of Taylors Cut, an off-take channel of the River Chess upstream of its confluence with the River Colne in Rickmansworth.

Taylor's Cut channel through parkland

Taylors Cut flows through 400 m of parkland which had become badly degraded. Restoration includes creation of wetland scrapes on the floodplain and installing berms and flow deflectors in the river channel. Taylors Cut had not been included in Environment Agency 2010 flood map modelling for the River Colne, so WRA produced 1D-2D hydrodynamic modelling using DHI's MIKE Zero software, based on channel cross-section and structure survey. Impact assessment showed a net reduction in the extent of 100-year flooding due to the extra storage capacity provided by wetland scrapes.



Flood depths and extents for two scenarios

New Associate

We are happy to report that Bob Bacciarelli is now a WRA Associate. In addition to land / marine surveys and ground investigations, he is experienced in geotechnical design for roads, foundations, earthworks, pipelines, power stations, buildings, harbours, offshore structures, slope stabilisation and quarrying. Bob has for the past 30 years managed GeoIndo and has been WRA's local partner in Indonesia. Since 2013, we have completed a number of projects together, including Baturaja and Lagoi Dam. Bob has now moved semi-permanently back to the UK.

Next WRA Board Meeting

25th July 2025. Location to be confirmed.

The WRA Bulletin is a quarterly publication, and relies on contributions submitted by Partners, Associates and Consultants. The document is circulated by email, and published on the WRA web-site, aiming to keep the WRA network up-to-date with respect to current activities. Please email contributions for future issues to Paul Whitehead: paul.whitehead@watres.com

Water Resource Associates LLP, PO Box 1674, Oxford, OX4 9QT. Tel: +44[0] 1491 838 190, www.watres.com