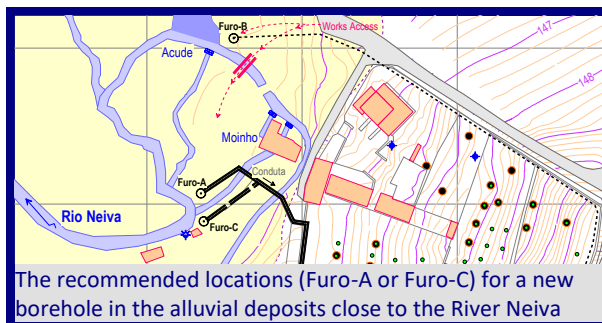


EUROPEAN WORK

New irrigation supply for Vilar das Almas, Portugal

Casa Moreira is a property in the parish of Vilar Almas, located adjacent to the River Neiva in northern Portugal. Although annual rainfall in the area is about 1675 mm, the monthly rainfall is only 30-60 mm during the period June to August. Therefore irrigation is needed for an area of over 7,000 m² at the property, mainly for fruit production with some horticulture and a lawn. Currently the irrigation water is drawn from two wells in a neighbouring shallow granite outcrop and by pumping directly from the River Neiva, but the supply is considered inadequate.



The recommended locations (Furo-A or Furo-C) for a new borehole in the alluvial deposits close to the River Neiva



The mill headworks at Casa Moreira

Paul Holmes has undertaken a hydrogeological study of the property and surrounding area, and also examined the low flow resources of the River Neiva. Various different options were then explored to develop a more robust water supply for irrigation:

- Storage of surface water in the river above the mill-pond.
- Weathered granite on lower levels of property.
- Granite adit or borehole in the upper levels, the front or behind the yellow house.
- Groundwater in alluvial deposits in the river floodplain.
- Groundwater in the shale area in Escariz, which is very far from the property.

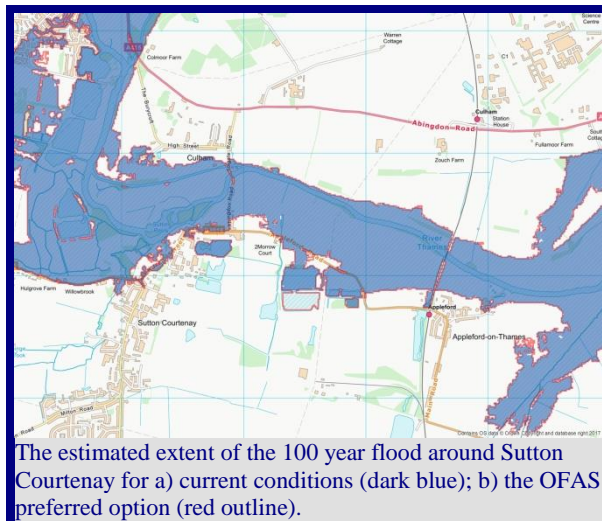
The study concluded that alluvial deposits located south-west of the mill presented the best option for groundwater development, exploited using a borehole depth of 10 m and 250 mm casing, equipped with a pump capacity of 2 to 5 l/s. A detailed design for this borehole was prepared, and submitted to the client.

UK WORK

Review of Oxford Flood Alleviation Scheme

WRA Partner Harvey Rodda led a team, composed of fellow Partner Frank Farquharson and Associate Julian Smith, to undertake a review of the proposed Oxford Flood Alleviation Scheme (OFAS). The aim was to provide the Vale of the White Horse District Council with an assessment of the downstream impacts of the proposed scheme on some villages located within their area of responsibility.

The work included a review of the hydrological and hydrodynamic modelling reports, produced by consultants on behalf of the Environment Agency, and a detailed examination of the predicted downstream extent of flooding for various events, under the two scenarios of the current situation and the preferred OFAS option.



The estimated extent of the 100 year flood around Sutton Courtenay for a) current conditions (dark blue); b) the OFAS preferred option (red outline).

The outcome was that a very small increase in the downstream flood levels by a matter of a few cm was predicted with the preferred flood alleviation scheme for Oxford. This is within the range of the error associated with this type of modelling. In terms of flooding this would mean a very slight increase in the flood extent for villages such as Sutton Courtenay, with the additional flood water only covering the existing flood plain and some abandoned gravel pits. The review concluded that WRA were in agreement with the Environment Agency in terms of the performance of the scheme and its downstream impacts.

Review of Roath Brook Flood Alleviation Scheme

Natural Resources Wales (NRW) are implementing a proposed major flood alleviation scheme in north-east Cardiff. The aim is to protect commercial and housing premises affected by flooding from both tidal backwater effects from the River Rhymney and fluvial flooding from the heavily urbanised upstream Roath Brook catchment (Figure 1). Frank Farquharson has supported local residents living alongside the Roath Brook who wished to challenge the final stage of this part of the scheme.

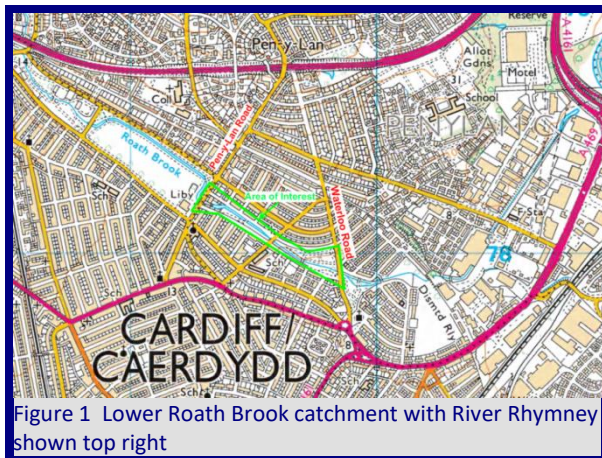


Figure 1 Lower Roath Brook catchment with River Rhymney shown top right

The lower tidal protection scheme between Waterloo Road and the River Rhymney is currently being constructed, but the proposal for the fluvial flooding would involve extensive tree felling and channel re-profiling in Roath Park just upstream. Figure 2 shows how narrow this park feature is with the first two trees already felled. The NRW plan would necessitate felling of almost all the remaining trees in the centre of the picture, with the channel being re-profiled with a sloping bank almost as far as the footpath shown on the right. Residents believe that this loss of mature trees and of so much land would spoil the park, and were seeking a review of alternative flood alleviation measures.



Figure 2 Roath Park looking downstream towards Waterloo Road

The review re-examined possibilities, originally discounted by NRW's consultants, to utilise potential flood alleviation options in either the on-channel Roath Park ornamental lake (Figure 3) or two other off-channel reservoirs located further upstream. Unfortunately the earth dam and spillway of the ornamental lake could not safely cope with significant surcharging, but the possibilities of utilising the upstream reservoirs, one of which is currently unused, are being studied.



Figure 3 Roath Park ornamental lake, looking upstream from the spillway

Social Media

WRA collates interesting news from various parts of the globe from local associates and ongoing projects: follow us on twitter @WaterResourceA. WRA is also on Facebook and LinkedIn.



WRA Board Meetings

Friday 2nd November 2018, Marlow

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 Nick Mandeville: nick@wates.com

Water Resource Associates LLP, PO Box 838, Wallingford, Oxon OX10 9XA. Tel: +44[0] 1491 838 190, www.wates.com