WRA Bulletin 35

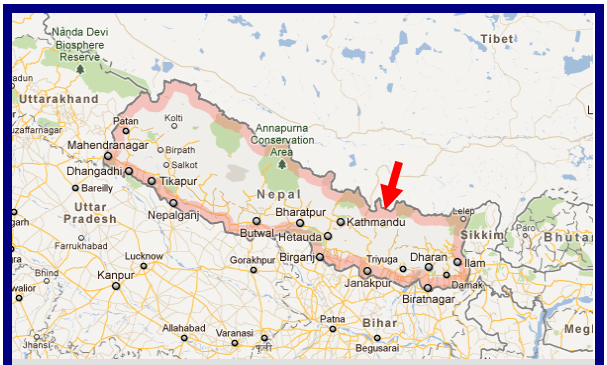
July 2013

FROM VISION TO REALITY

WRA has been involved in a wide range of water resource projects from initial ideas and conception through design to final commissioning and use. This bulletin is dedicated to two of these projects.

Upper Tamakoshi Hydroelectric Project

This peaking run-of-river scheme is located right in the middle reaches of the Himalayan mountains in Nepal, about 6 km from the border with China. Nick Mandeville, together with a counterpart hydrologist from the Nepal Electricity Authority, assisted Norconsult International in 2004, by contributing to the hydrological analysis for the Feasibility Study.



Map of the project location

Construction commenced in 2010, using in-country funding sources. Although its maximum output of 456 MW is modest by international standards, when completed in 2016 it will be the largest hydropower scheme in Nepal, and assist in alleviating the current critical load shedding afflicting Kathmandu and other cities in the country.

A notable feature of the scheme is that it is located at the site of a huge 300 m high historical landslide, that blocked the steep-sided valley of the Tamakoshi river about 400-500 years ago, so providing a substantial gross head of 822 m water drop through the penstocks to drive the turbines.

The 1,745 km^2 catchment area of the Tamakoshi river, upstream of the intake location, originates behind the main massif of the Himalayas, in a rain shadow. Downstream of the tailrace this river joins the Sun Koshi river, then the Saptakoshi, which is a transboundary river flowing from Nepal into India, eventually to join the Ganges. Because the intake reservoir at the scheme is relatively small, with a height of 22m and live storage of 1.2 million m^3, it only causes a change to the diurnal variation in river flows, and does not reduce the total flow volume reaching the Ganges river.

Left image: Sediment filled basin behind historical landslide.

Right image: Coffer dams at the intake headworks.

UK WORK

Horsemoor Reservoir and Wild Meadow

In 2008, WRA was commissioned by the Bedford Estates to develop a new water strategy for the key enterprises at Woburn, with a view to making them more self reliant and cost efficient while improving overall management of water. Work focused in particular on the Deer Park, Safari Park and Golf Club.

Since then, new source development has included exploration of groundwater in the Woburn Sands aquifer, approval by the Environment Agency of two new abstraction licences, use of the lakes in Woburn deer park and construction of a new 100 Ml non-impounding embankment dam, Horsemoor Reservoir, involving a dedicated WRA team of 20 specialists.

Filling Horsemoor Reservoir from a mixture of groundwater and Anglian Water mains

The comparison of dam sites, design, planning and environmental impact assessment was all completed by WRA during 2010-11. The main obstacles to

overcome were ecology, archaeology and highways regulations regarding access to site. An archaeological dig was carried out prior to construction, and Headland Archaeology had a field-team of over ten people on site during excavation, uncovering a wide range of Roman and Iron-age artefacts including iron forges and pottery.

Pinfold Production borehole in operation

In 2012, WRA prepared the detailed engineering design drawings for tender, awarding the construction contract to Prime Irrigation in October 2012.

The reservoir scheme occupies a 6.5 hectare open site, half of which has been dedicated to creation of a new wild meadow, using excess spoil from the reservoir basin, and this was the subject of a creative design by WRA's landscape architect.

Lower Drakeloe Pond – new surface water abstraction site

Inspection by the County Archaeologist

WRA Director/Associate News

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Sean Avery (right) with the Rhino charge team members

On June 1st, WRA's East African resident Partner Dr Sean Avery won the Kenya Rhino Charge (http://www.rhinocharge.co.ke). This exciting off-road event is held annually to raise money for Rhino Ark Charitable Trust

Mark Robinson has joined WRA as an Associate. Dr Robinson has over 30 years experience at CEH Wallingford, has lectured at Reading and Oxford University, and co-authored the standard textbook Principles of Hydrology.

Mark Robinson

Next WRA Board Meeting

11 October 2013, Blewbury

The WRA Bulletin is a quarterly publication, and relies on contributions submitted by Directors, 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 Harvey Rodda: harvey@watres.com

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