

# Llanfair PG, Wales

## Passive vertical downflow: Secondary sewage



### Project

Llanfair PG, Cheshire  
County Council

### Location

The Conway Centre

### Project Type

Design and construct

### Wastewater Type

Secondary sewage

### Completion Date

2009

### Treatment System

Passive vertical flow  
reed bed

## Needs

The Conway Centre in Llanfair PG is owned and run by Cheshire County Council as a residential and day arts and outdoor education facility. It is set in idyllic National Trust parkland on the Island of Anglesey in North Wales. The centre is primarily for students and pupils from schools and colleges in Cheshire though other organisations use the facility. For many years the wastewater generated on site was discharged post settlement into the Menai Straits adjacent to the centre relying on dilution as a means of effluent management. Conscious of their environmental responsibilities and that this was an educational establishment Cheshire County Council felt that a more appropriate method of effluent management should be used on the site and were keen to select as sustainable solution as possible. Their environmental consultants, Peak Associates requested ARM Ltd to design and install a suitable reed bed treatment solution.

More than 21,000 children and adults attend the centre each year and there are 420 beds on site making it one of the largest residential arts and educational centres in the UK.

FLOW AND LOADS		INFLUENT AVERAGE	DISCHARGE CONSENT
Flow	(m <sup>3</sup> /d)	55	–
BOD	(mg/l)	400	40
Suspended Solids	(mg/l)	300	60

The measured loads and consents are outlined in the table above.



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### Solution

The treatment solution had to be positioned near to the rear of the main accommodation building in line with the existing sewerage infrastructure where there was limited available space. The National Trust also specified that a specific distance be maintained from mature trees in this area. Trial pits were dug to establish the position of the existing effluent pipes. These were taken into consideration in the new treatment reed bed design and subsequently required minimal alteration. Because there was little available land a passive vertical flow reed bed was selected as the most appropriate solution. This allowed us to adjust the dimensions of the bed to fit the available space. ARM Ltd installed a 60 m<sup>3</sup> two

stage settlement tank, specified by others, followed by a bed of 440 m<sup>2</sup>.



### Benefits

The reed bed treatment installation provided Cheshire County Council with an improved, robust and sustainable treatment solution for the Conway Centre. The reed bed also became a feature for the centre being used as an example of sustainable technology development and application for children and others attending courses.