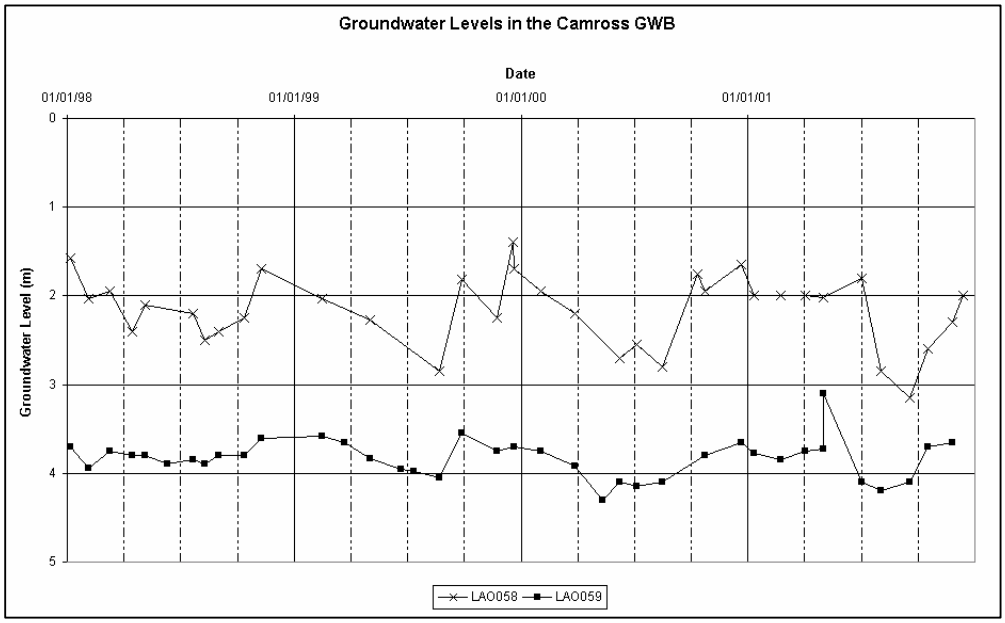
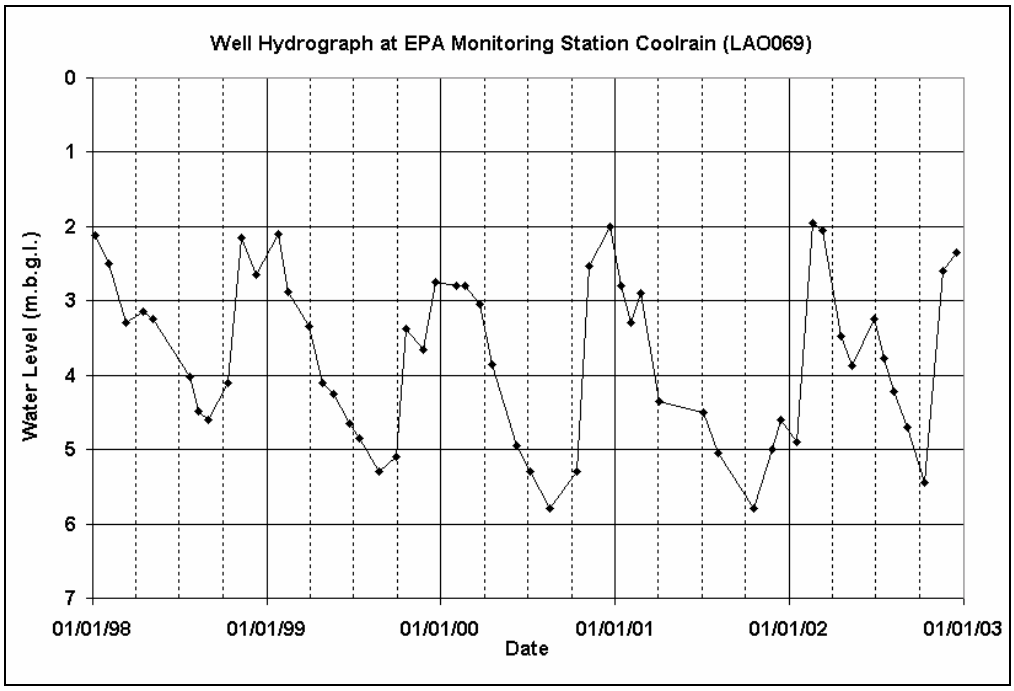
Coolrain GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km^2)
Laois Co. Co. Offlaly Co. Co. Hydrometric Area 15		Tonet, Delour, Kileen, Mountrath, Cappanacloghy	Slieve Bloom Mountains, Delour River near Lacca Manor, Coolrain Bog,	51
Topography		This groundwater body is located at the base of the southeasterm slopes of the Slieve Bloom Mts. The topography is quite varied through out the groundwater body. There are isolated hills (e.g. Clonin Hill at 202mOD) which suspend the generay trend of reducing elevations from Northwest to Southeast.		
Geology and Aquifers	Aquifer type(s)	**Rf**: Regionally Important Fractured Aquifer.		
	Main aquifer lithologies	Clonaslee Member – CWcl – Medium to coarse grained creamy sandstones		
	Key structures.	The strata dip northwards at 10 – 20°. A number of faults with a N-S direction are noted in the area of the Clonaslee wellfield		
	Key properties	Transmissivity 20 to 90 m^2/d. Storativity = 8.4 x 10^{-4}		
	Thickness			
Overlying Strata	Lithologies	Peat is found at the highest elevations of Slieve Bloom. Further down the mountain there is a large variety in the subsoil type. In the north of the groundwater body there is a large proportion of rock close to surface. South of that there is a large area of gravel deposition. These gravel deposits are an aquifer and are classed as a separate groundwater body. South of this there are deposits of limestone-derived till.		
	Thickness	Thickness of the subsoil is varied but is mostly below 10m in thickness.		
	% area aquifer near surface	Low		
	Vulnerability	Mostly HIGH, with large areas of MODERATE to the northeast and EXTREME to the West.		
Recharge	Main recharge mechanisms			
	Est. recharge rates	*[Information will be added at a later date]*		
Discharge	Springs and large known abstractions	Camross, Knock, Roundwood & Mountsalem WS		
	Main discharge mechanisms	This groundwater body discharges to the over lying rivers as baseflow. Evidence suggests that the groundwater body is capable of maintaining a high summer flow in rivers (Gauge 15021 has a DWF value of 2.5 $l/s/km^2$, which is considered to be a high value). There is also evidence that the groundwater body is discharging at the contact with the Lower Limestone Shales, which represent a groundwater flow barrier. Examination of surface water features in the area shows that many small streams being at the contact of the two rock units. Discharge is also possible from outside the area of the aquifer since a borehole can be drilled through the Lower Limestone Shale and through in to the confined areas of the aquifer. Experience from other analogous areas of this aquifer shows many supplies drilled in such a manner are often artesian.		
	Hydrochemical Signature	In Slieve Bloom during the last glacial period, thick subsoils were deposited in the area occupied by the present day Delour Valley. The groundwaters in the bedrock are only moderately hard waters (220-240mg/l as $CaCo_3$) but waters sampled from the recharging outcropping areas will be much softer. However, the bedrock waters have a high Mg/Ca ratio, which reflects the lower levels of calcium and higher levels of magnesium in the strata. The groundwaters in this aquifer are mainly calcium/magnesium bicarbonate type waters. The average electrical conductivity is 374 (µs/cm). The bedrock strata in this aquifer are **Siliceous**. ??		
Groundwater Flow Paths		This groundwater body has the ability to maintain regional groundwater flow. Analysis of the drainage density in the area of the aquifer show that some areas e.g. east of Camross, area completely devoid of surface water features. In these areas the transmissivity and storativity of the rock is high enough to transport and store recharged water with out have to discharge it to surface water bodies.		
Groundwater & surface water interactions		The groundwater and surface water interaction in this aquifer are mixed. The interactions will be related to the presence or absence of surface water features. Where there are rivers, the aquifer has sufficient storage to maintain river flows during the dry summer months. Where surface water features are absent the potential recharge is most likely to percolate to the water table as interflow to surface streams is not possible. This may have significance when considering the transport of diffuse pollutants in the area.		

Conceptual model	The Nore River Catchment defines the extent of this aquifer to the Northeast and southwest. Elsewhere the it's extent is defined by the occurrence of the Clonaslee Sandstone. The aquifer it considered to be a Regionally important fractured aquifer, capable of supporting large abstractions and regional groundwater flow. Recharge to the aquifer is possible over the total area of the aquifer, although a higher amount of recharge will occur where there are thinner subsoils e.g. to the east. The groundwater flow is mostly to the southeast, although three there are isolates hills groundwater flow will radiate from these. There is evidence that where rivers traverse the aquifer it supplies a significant baseflow to the river. In other areas, where the aquifer is more extensive e.g. east of Camross there is a very low drainage density. The aquifer discharges to the overlying rivers and also to small streams which have their source at the contact between this groundwater body and the lower limestone Shales which overlie it to the South east. The aquifer dips underneath these Lower limestone shales, here groundwater flow is confined and it is possible to obtain groundwater source by drilling through the shales and into the Sandstone. This form of development also provides greater protection to the groundwater source from surface sources pollution
Attachments	Hydrographs LAO058 & LAO059, LAO069
Instrumentation	Stream gauge: 15020, 15021 Borehole Hydrograph: LAO058, LAO069 EPA Representative Monitoring boreholes: Knocks (Bore) (#40 – N370001)
Information Sources	Barber, W. (1979) Evaluation of Groundwater Resources of the Clonaslee Area Co. Offaly. Geoex Limited. Hand, M.G. (1987) Aquifer Protection Policy in Ireland - A Case Study. IAH (Irish Group) 7th Annual Groundwater Seminar. Deakin, J., Fitzsimons, V., Gately, C., Wright, G. 2002. *Laois Groundwater Protection Scheme.* Geological Survey of Ireland. Daly E.P. (1994) Groundwater Resources of the Nore River Basin. Geological Survey of Ireland.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae




Well Hydrograph at EPA Monitoring Station Coolrain (LAO069)
Water Level (m.b.g.l.)
0
1
2
3
4
5
6
7
01/01/98
01/01/99
01/01/00
01/01/01
01/01/02
01/01/03
Date