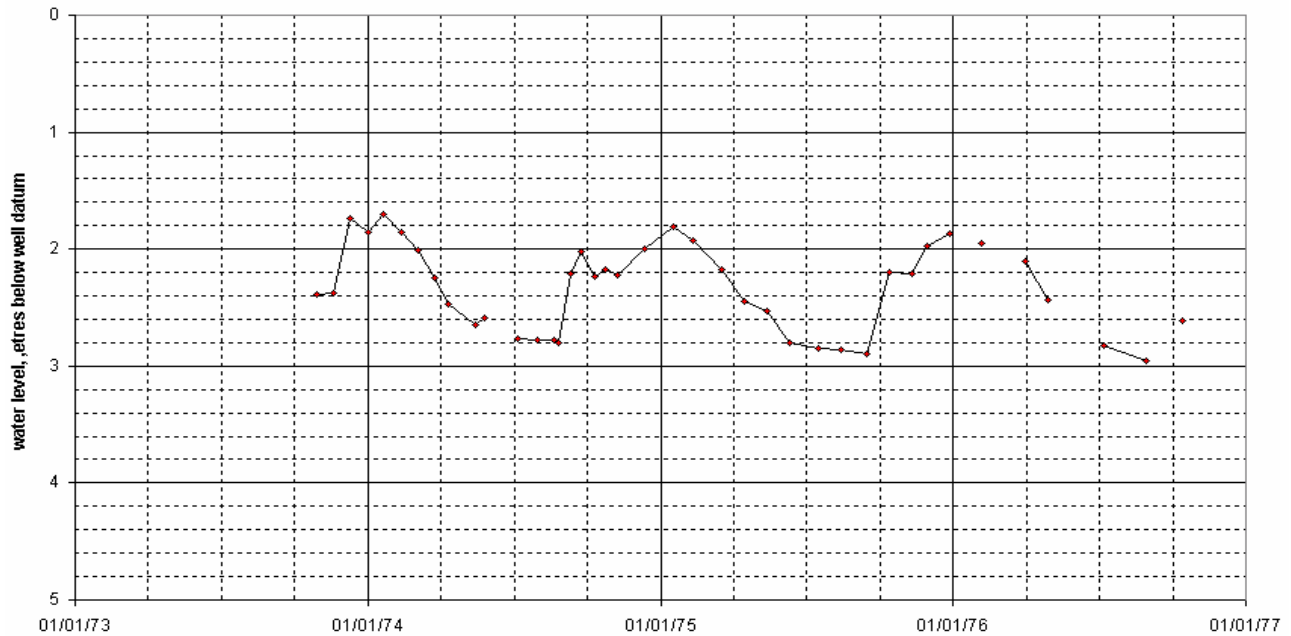


Rathdowney GWB: Summary of Initial Characterisation.

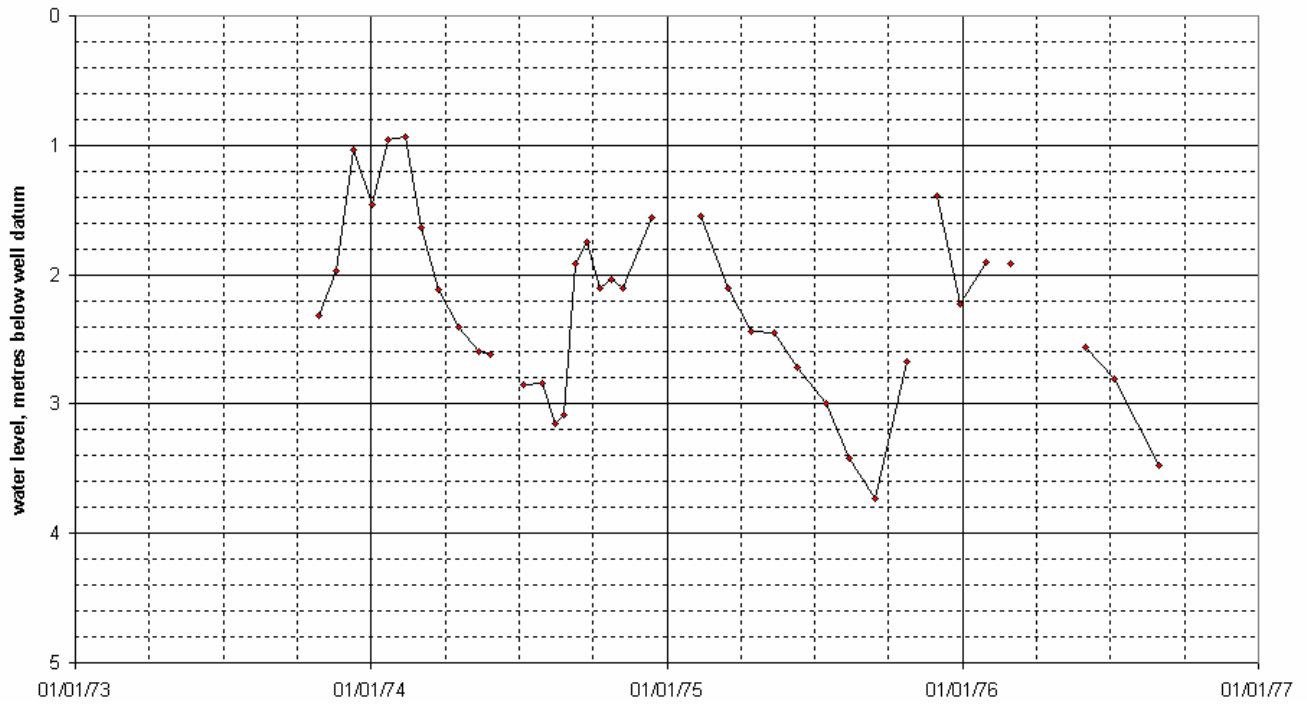
Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km ²)
15 – Nore Laois Co Co Kilkenny Co Co		Nore, Tonet, Delour, Mountrath, Cappanacloghy, Ballytarsna, Ballyroan, Gully, Donaghmore Stream, Erkina, Rathdowney Stream, Goul,	Monaincha Bog/Ballaghmore Bog, Coolrain Bog, Knockacoller Bog, Forest House Wood, Mannin Wetland, Shanahoe Marsh, Cuffsborough, Grantstown Wood and Lough, Galmoy Fen, River Nore / Abbeyleix Woods Complex, The Curragh and Goul River Marsh	503
Topography		The highest elevations in this groundwater body are to the north on the lower slopes of Slieve Bloom. The source of the River Nore is found in the northwest of this groundwater body where initially it flows north and then makes a broad about turn around Castletown where it flows south. This occurs because of a slightly elevated area between Rathdowney and Borris in Ossory, which forces the Nore northwards, before Slieve Bloom forces it southwards again. The overall topography of the area can be considered as a gently undulating upland area.		
Geology and Aquifers	Aquifer type(s)	LI – Locally Important Aquifer, moderately productive only in local zones		
	Main aquifer lithologies	BA - Ballysteen Formation - Fossiliferous dark-grey shaly limestone WA – Waulsortian Limestones - Massive unbedded limestone DW - Durrow Formation - Shaly fossiliferous & oolitic limestone AG - Aghmacart Formation - Dark shaly fine-grained limestone		
	Key structures.	Groundwater flow is affected by the anticline located at the southwest of the body; there is also a greater degree of faulting in this area.		
	Key properties	A pumping test in the Durrow Formation near Ballyragget shows a specific capacity of 40 m ³ /day/m. Analysis of data from this test (Jacob method) provided a transmissivity estimate of 15 m ² /d. Using a conservative aquifer thickness estimate of 10 m, a permeability of 1.5 m/day has been derived from the transmissivity estimate. A porosity of 0.01 has been assumed for the Durrow ‘LI’ aquifer on the valley floor. This is at the lower end of the typical range used by the GSI for bedrock aquifers (0.025 to 0.01) and reflects the belief that fracturing is not particularly dense in this portion of the aquifer.		
	Thickness	Given common weathering patterns, most flow is thought to be relatively shallow; concentrating in the top 10 m to 30 m of the rock profile		
Overlying Strata	Lithologies	To the southwest the subsoil type is mainly limestone-derived till. In the northeast there are widespread gravel deposits which are thin and therefore not considered to be aquifers.		
	Thickness	Typically between 1 and 3m, subsoil is thinner in the south.		
	% area aquifer near surface	Low - 20%		
	Vulnerability	Mostly HIGH with small areas of EXTREME and fewer areas of LOW. The proportion of the area that is EXTREME increases to the south		
Recharge	Main recharge mechanisms	Most recharge is expected to occur locally; there is no evidence of swallow holes or sinking streams. Diffuse recharge will enter the groundwater body directly from the surface where subsoil is thinnest or most permeable.		
	Est. recharge rates	<i>[Information will be added at a later date]</i>		
Discharge	Springs and large known abstractions	Clonakenny (23), Derrin (Borris-in-Ossory WS) (500), Townparks (Borris-in-Ossory WS) (193), Colrain Co-Op, Donoghmore GWS (90), Raheen GWS (13), Donaghmore Co-Op Creamery (90), Meadow Irish Meats (273), Fermoy PWS, Urlingford / Johnstown (966),		
	Main discharge mechanisms	Discharge from this groundwater body is to the local rivers, which appear to be in hydraulic connectivity with the groundwater body. There some springs located with in the groundwater body but evidence suggests these are not karst features.		
	Hydrochemical Signature	The bedrock strata of this groundwater body are calcareous . The limited data available show the groundwaters are “very hard” and have a calcium bicarbonate signature. The groundwaters have typical electrical conductivity of 700 µs/cm.		
Groundwater Flow Paths		Fracture flow is expected to be dominant. Flows are expected to be concentrated in fractured and weathered zones. Faulting and associated fracturing are likely to be a focus for groundwater flow. Due to the likely low permeability of the Durrow Formation, groundwater gradients are probably similar to topographic gradients, and are estimated to range from 0.004 (1 in 250) to 0.02 (1 in 50).		
Groundwater & surface water interactions		Groundwater will discharge locally to streams and rivers crossing the aquifer and also to small springs and seeps. Owing to the poor productivity of the aquifers in this body it is unlikely that any major groundwater - surface water interactions occur. Baseflow to rivers and streams is likely to be relatively low.		

Conceptual model	This groundwater body in north Kilkenny and south Laois consists of the locally important aquifers of the Ballysteen Limestone and the “Calp-like” limestones of the Durrow and Aghmacart formations. Most groundwater flow is considered to take place within the top 15m from the surface where the bedrock is fractured. The borehole water level data suggest the aquifer may be more developed towards the south, where we find deeper groundwater flow with a higher fluctuation in water level which is more typical of a karstic flow regime..
Attachments	(Figure 1 – 9) Borehole Hydrographs (Figure 10) Durov Plot of chemical data
Instrumentation	Stream gauge: 15008, 15035, 15027, 15007, 15010, 15041, 15052, 15048, 15051, 15038, 15042, 15030, 15033, GSI - Borehole Hydrograph: LS 21/1, LS 16/1, LS 23/1, LS 22/2, LS 28/1, LS 28/168, LS 29/2 (LAO064), EPA Representative Monitoring boreholes: Laois - Clonakenny GWS (#81 – S120820), Donoghmore (#37 – S260850), Fermoyle (#39 – S361791) Kilkenny - Spring Toberpatrick Urlingford (#34 – S300635)
Information Sources	Buckley, R. & Fitzsimons, V (2002) Urlingford and Johnstown Public Supply, Groundwater Source Protection Zones.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

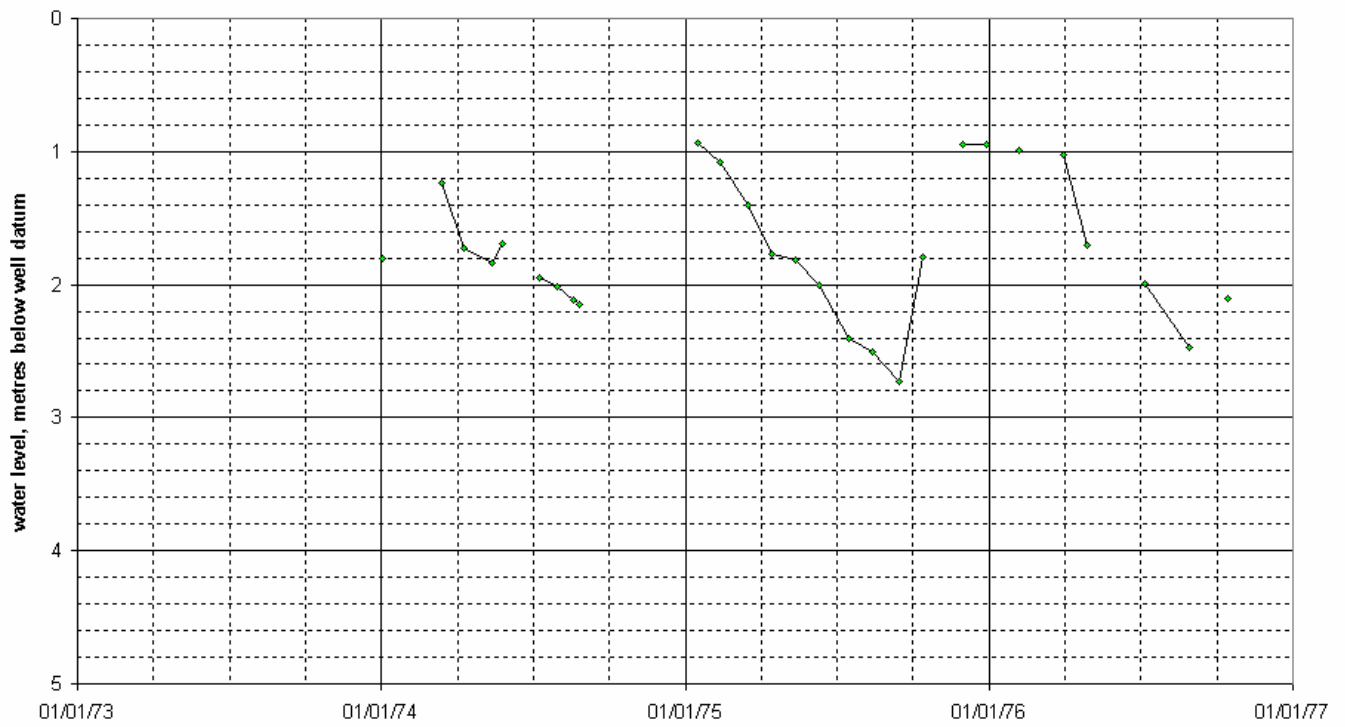
Well Hydrograph, LS 21/1



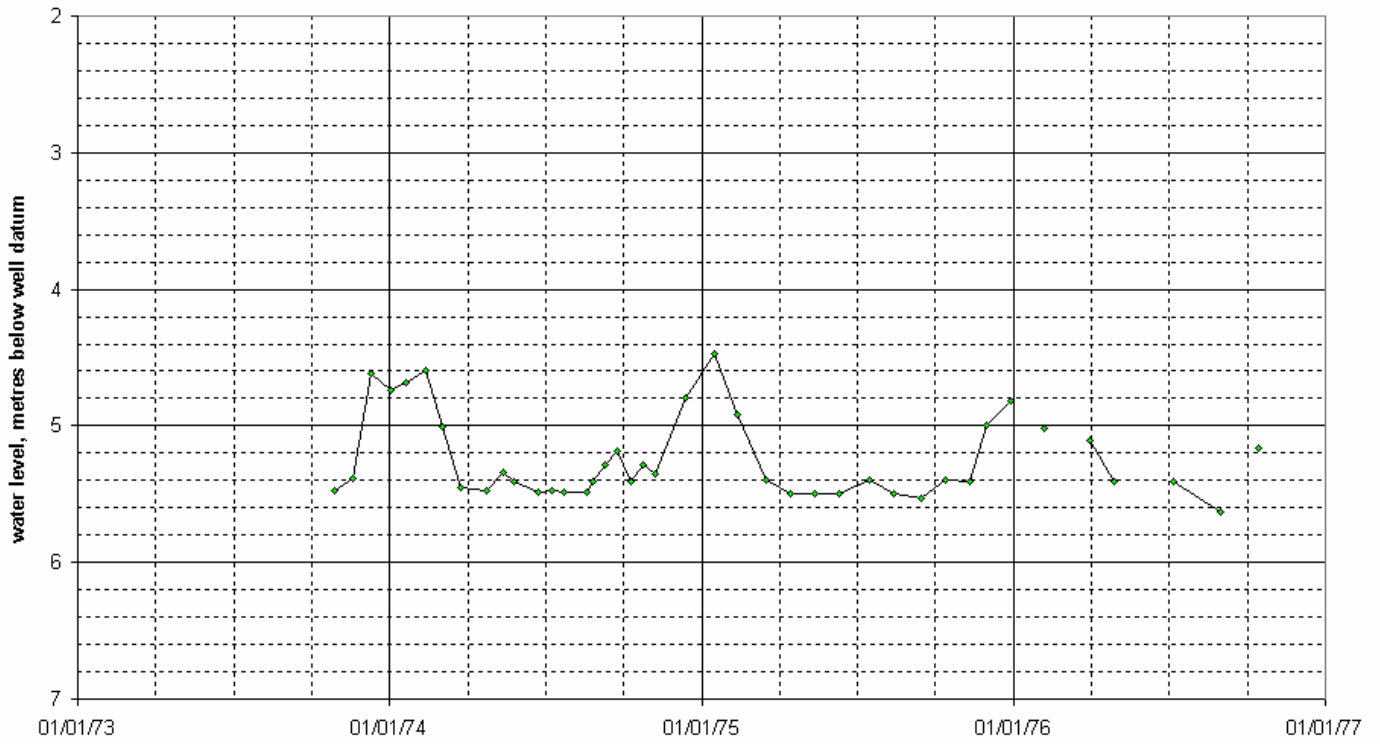
Well Hydrograph, LS 23/1



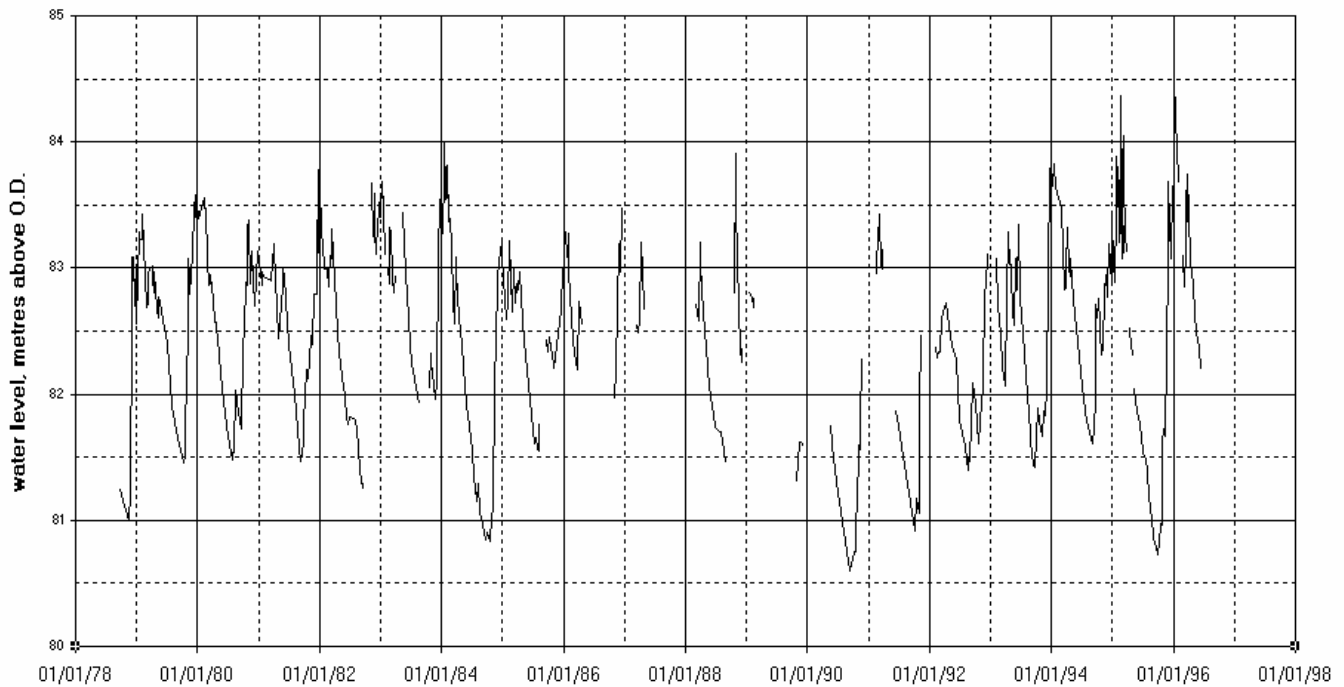
Well Hydrograph, LS 22/2



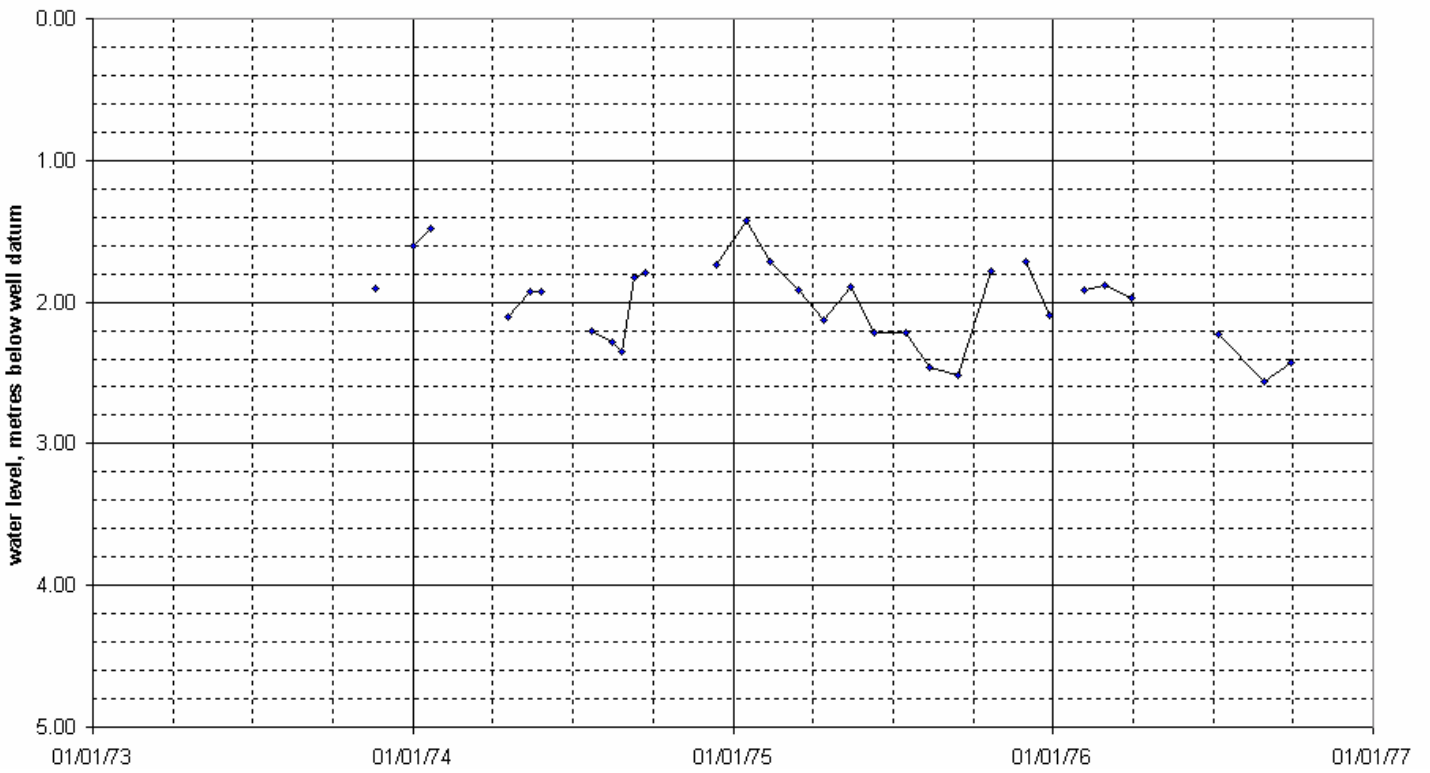
Well Hydrograph, LS 28/1



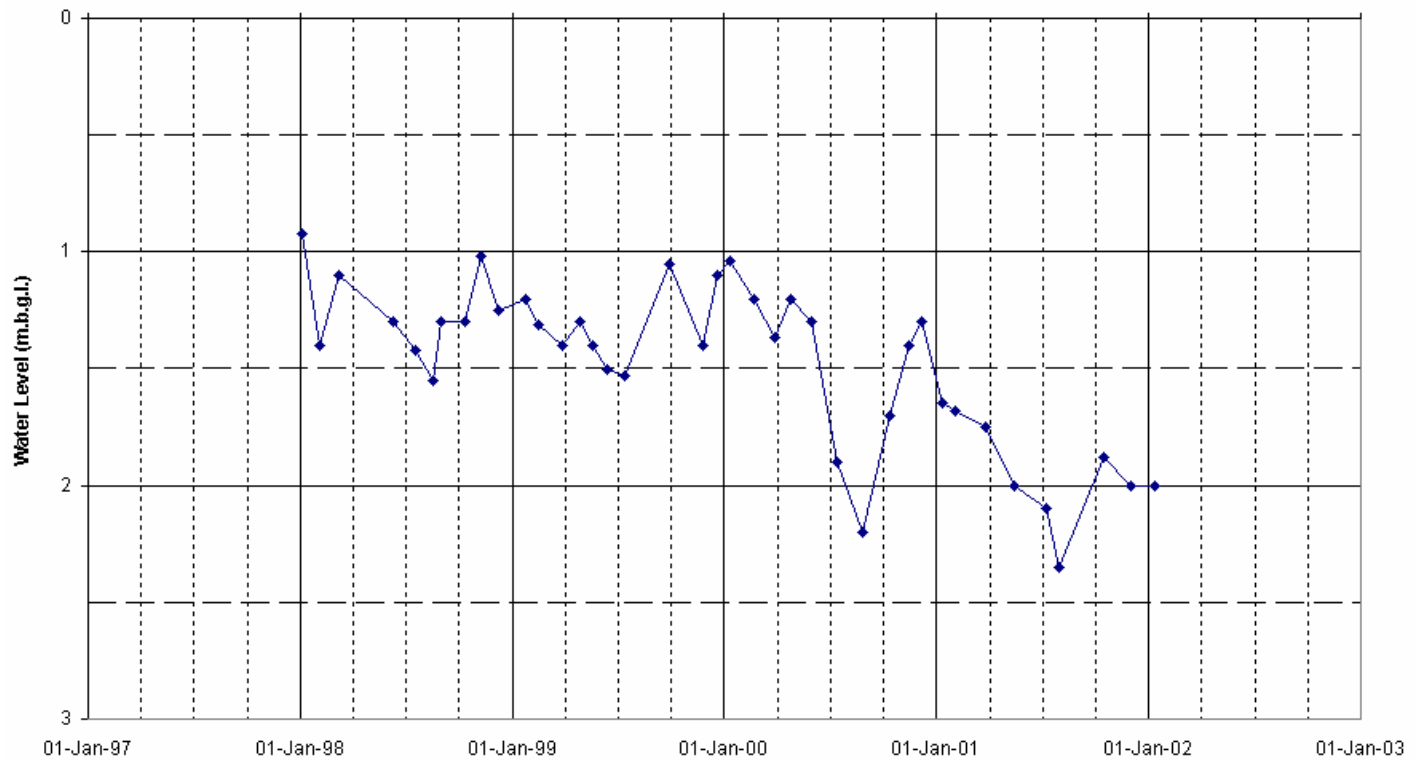
**Well Hydrograph, Granston Manor, Durrow, Co. Laois,
(LS 28/168) NGR S 339 785: 30m deep borehole
in dolomitised Crosspatrick (limestone) Formation**



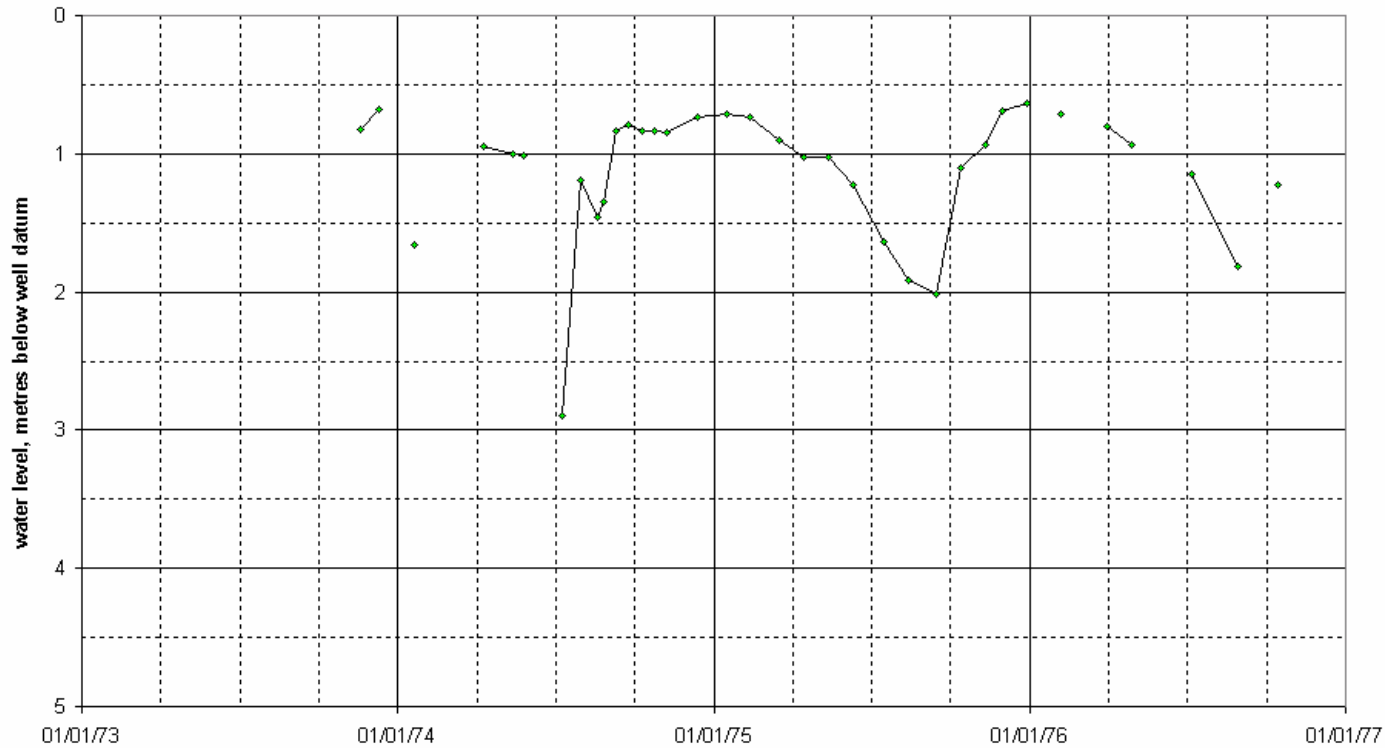
Well Hydrograph, LS 29/2



EPA Baorehole Hydrograph at Station LAO064



Well Hydrograph, LS 16/1



Chemical Signature of Relatively Uncontaminated Waters (expanded Durov Plot)

