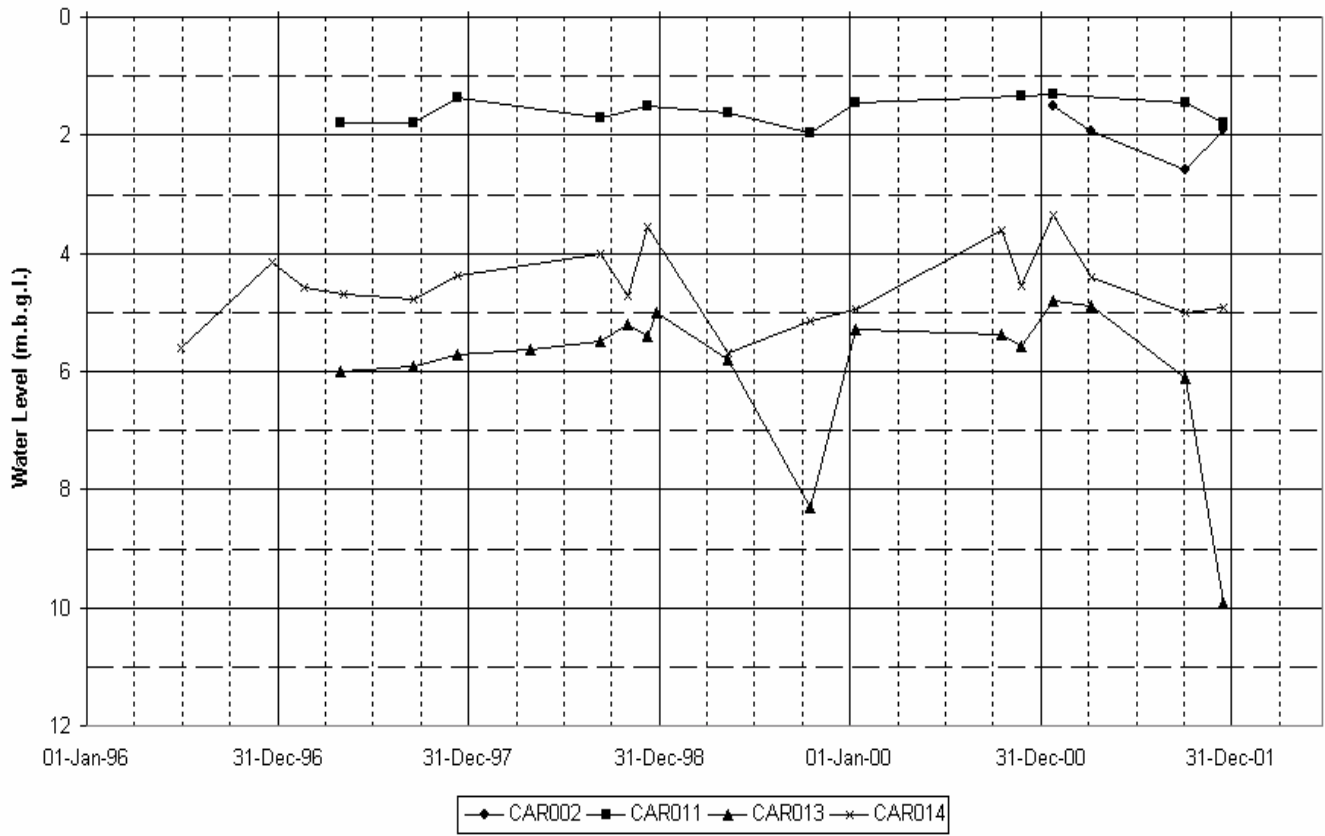


**Bagenalstown GWB: Summary of Initial Characterisation.**

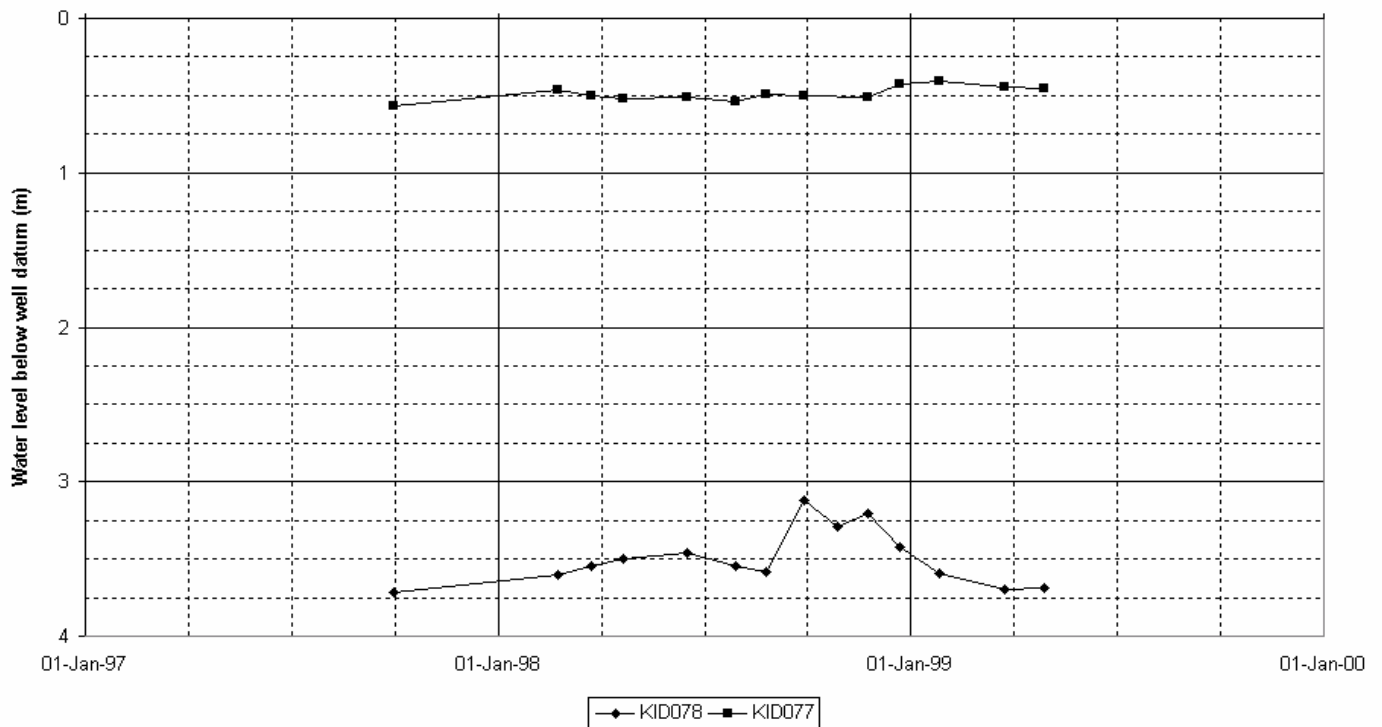
Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km <sup>2</sup> )
14 – The Barrow Carlow Co. Co. Kildare Co. Co.		The Barrow, Gowran, Monefelim, Old Leighlin Stream, Fushoge, Burren, Lerr, Douglas, Greese, Levistown stream, Athy stream, R. Stradbally, Crooked, Dunrally Stream, Tully stream, Slate, Figile, Triogue, Cloncumber Stream, Fuer, Grange Stream, Powerstown, Ballynaboley Stream.	Oakpark, Cloghristick Wood, Pollardstown Fen, Emo Court, Great Heath of Portlaoise, Derries Wood, Dunamase Woods, Stradbally Hill, Clophook Wood, Barrow Valley.	774
<b>Topography</b>		The overall topography of this GWB shows higher elevation to the northeast and west. Therefore the drainage is southwards as represented by the River Barrow. To the east rise the Blackstairs Mountains, which can extend to elevations of 800m in places. To the west is the Castlecomer Plateau, which rises to 330m. To the north there are no extensive elevated areas, but the higher topography in this region represents the boundary between the Eastern and Southeastern River Basin Districts.		
<b>Geology and Aquifers</b>	Aquifer type(s)	<b>Rk:</b> Regionally important karstified aquifer. This groundwater body is considered a major aquifer. It comprises water-bearing units of pure limestone and dolomitised limestone and Calp. The dolomitisation is not complete and therefore there may be areas of undolomitized limestone that act as aquitards.		
	Main aquifer lithologies	BM : Ballyadams Formation – Pale-grey thick-bedded pure fossiliferous limestone MI – Milford Formation - Varied limestone succession (partly dolomitised), dominantly coarse-grained, with some finer beds. CL - Clogrennan Formation - Thinly bedded bluish-grey pure limestones, regularly cherty. RK – Rickardstown Formation. – Cherty often dolomitised limestone. AW – Allenwood Formation - Mainly pale grey, pure massive limestone, commonly dolomitised. Dolomite – Various lithologies in the area have been dolomitised - where limestone has been altered by the replacement of calcium carbonate (CaCO <sub>3</sub> ) by magnesium carbonate (CaMg(CO <sub>3</sub> ) <sub>2</sub> ).		
	Key structures.	The dolomite aquifer is presumed to be of “replacement” origin and hence may contain some primary permeability. The dominant secondary permeability of the dolomite results from the development of fissures by the solution of bedding planes and joints. In the undolomitised pure limestones only secondary permeability exists.		
	Key properties	The transmissivity of the dolomites can range from 20-200m <sup>2</sup> /d, with a specific yield less than 2% (storage coefficient 10 <sup>-4</sup> ) Transmissivity is lower on the slopes of the Castlecomer Plateau and increasing down the Barrow Valley.		
<b>Overlying Strata</b>	Thickness	Fissuring in the dolomites should extend to over 200m. Fissuring in the pure limestones is common in the upper 20m of the aquifer, but rapidly reducing with depth and probably does not exist below 90m.		
	Lithologies	Sands and gravels overlie significant areas of this groundwater body and are themselves discrete groundwater bodies. The sands and gravels are very coarse and poorly sorted and are similar to those seen in the Nore Basin. Clay layers often separate individual layers of the sands and gravels. In other areas, Till derived from limestone is the dominant overlying material.		
	Thickness	In the Barrow valley the thickness of the gravels is commonly over 10m. This thickness reduces to the south.		
	% area aquifer near surface	<i>[Information will be added at a later date]</i>		
<b>Recharge</b>	Vulnerability	<i>[Information will be added at a later date]</i>		
	Main recharge mechanisms	In the Barrow valley the aquifer will mainly recharge along the slopes of the Castlecomer Plateau, because of a thin subsoil covering. As streams cross the shale/limestone area, water frequently enters the aquifer via swallow holes.		
	Est. recharge rates	<i>[Information will be added at a later date]</i>		

<b>Discharge</b>	Springs and large known abstractions	Emo (200), Portlaoise WS (Ballydavis (4300), Meelick (773), Derrygarron & Darkin Well) (Portlaoise WS), Heath GWS (110), Vicarstown (41), Kyle (350), Orchard (250), Coolenaugh (10), Ballinabranna (150), Tomard GWS (2), Old Leighlin (10), Leighlinbridge Borehole No 1 (330), Leighlinbridge Borehole No.2 (350), Bagenalstown Borehole A (1554), Bagenalstown Borehole B (1554), Bagenalstown Borehole C (1554), Paulstown (910). KILDARE :Bracknagh (200), Rathangan (Spring), Monasterevin WS(spring at Hybla), Avonmore Creameries (273), Pollardstown Fen (Spring), Osborne Lodge, McDonagh (Curragh Camp) (450), Hare Park (Curragh Camp) (1000), Kildare Chillings Co. (700), Tully Springs, Maddenstown, Kildangan WS (28), Kildangan Housing WS (50), Monasterevin WS (BH No.1 & 2 ) (550), Kilberry (B na M) (41), Kilberry Area WS (90), Kilberry Area WS (400), Kilberry Housing WS (24), Churchtown WS (120) , Castlemitchell GWS (18), Castlemitchel Housing (10), Castlemitchel Quarry (10), Belview, near Athy (36), Irish Board Mills (Barrowford Rd, Athy - 10), Athy WS (Townparks Bore, Infiltration Gallery, Greysland Bore (650)), Minch Norton & Co (Athy 205), Amalgamated Meat Packers (Bagenalstown - 500)
	Main discharge mechanisms	It is probable that the bulk of the discharge from the aquifer enters the river in the lower section between Milford and Bagenalstown where there is a restriction in the cross-sectional area of this aquifer.
	Hydrochemical Signature	The bedrock strata of this aquifer are <b>Calcareous</b> . <i>[More information will be added at a later date.]</i>
<b>Groundwater Flow Paths</b>	There is hydraulic continuity between the Barrow Valley sands and gravels and the underlying aquifer. Under natural non-pumping conditions the flow regime in the aquifer is severely restricted, as there is no natural discharge down-dip. Hence the aquifer will be full of water and circulation will be limited to the near surface zone. Under pumping conditions leakage will occur from the sands and gravels into the aquifer.	
<b>Groundwater and surface water interactions.</b>	There appears to be swallowholes in the west of the Barrow valley along the slopes of the Castlecomer Plateau.	
<b>Conceptual model</b>	The Barrow Valley has been divided into three areas (Daly & Wright 1979): (i) A recharge area along the slopes of the Castlecomer Plateau where the water table is 15 – 30m b.g.l. and there is an annual water level fluctuation of 10-20m. (ii) An intermediate area where the aquifer is covered by extensive till deposits of 10-20m thickness, the water table is usually within 5-15m of the surface with an annual fluctuation of less than 7.5m. Both confined and unconfined conditions exist here, depending on the subsoil. (iii) A discharge zone occurs where the aquifer comes in contact with the Barrow River either directly or through the overlying sands and gravels. Here the water table is within 5m of the surface and fluctuations will be less than 2.5m and mostly controlled by the levels in the river.	
<b>Attachments</b>	(Figure 1) Map of GW body incl. Aquifers, Monitoring boreholes, public supplies and water quality data (Figure 2) Durov plot. – To Follow	
<b>Instrumentation</b>	<p><b>Stream gauge:</b> 14019, 14007, 14044, 14031, 14011, 14005, 14011, 14005, 14006, 14031, 14030, 14007, 14044, 14020, 14041, 14019, 14045, 14055, 14034, 14022, 14001, 14056, 14013, 14056, 14017, 14052.</p> <p><b>Borehole Hydrograph: EPA Monitoring Boreholes:</b> Bagenalstown Railway station (S708614 - #CAR002), Celtic Linnin , Carlow (S724768 - #CAR011), Carlow Sugar Factory (S720785 - #CAR013), Landfill Site Carlow &amp; Kilkenny (S712742 - #CAR014), Tully (N730118 - #KID078) (N736110 - #KID077), Vickerstown (N614002 - #LAO030), Ballygormill (S526931 - #LAO056), Timahoe (S537902 - #LAO055), Tomaclavin (S587901 - #LAO054), Ballylinan (S643886 - #LAO061), Kilmore (S681885 - #LAO062),</p> <p><b>EPA Representative Monitoring boreholes:</b>  <u>Carlow:</u> Oakpark (#15 - S730800), Carlow Sugar Factory (#13 - S720785), Celtic Linen, Carlow (#11 - S724768), Mortartstown GWS (#14 - S712742), Leighlin Bridge (#9 - S708675), Orchard Springs (#16 - S707677), Rathduff GWS (#17 - S715638), Bagenalstown (#1 - S713620), (#2 - S708619), (#3 - S710620), Aughney Springs (#10 - S720619). Corcoran's Carlow Town (#12 - S717766).  <u>Kildare:</u> Pollardstown Fen (#23 - N772154), Hybla (N642125), Hare Park (Curragh Camp (#42 - N770115)), Osbourne Lodge (#74 - N755146), McDonagh Pump Stn (#50 - N78817, Monasterevin (#14 &amp; 15 - N642125), Kilberry WS (#9 - N662000), Curchtown WS (#18 – S640955), Laois : Coolenaugh (#13 - S678836), Paulstown Castle (S660570), Portlaoise WS (#23 - N494019, #21 - N502007 &amp; N478972)</p>	
<b>Information Sources</b>	Daly E.P. (1981) Nitrate Levels in the Aquifers of the Barrow River Valley. GSI.	
<b>Disclaimer</b>	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae	

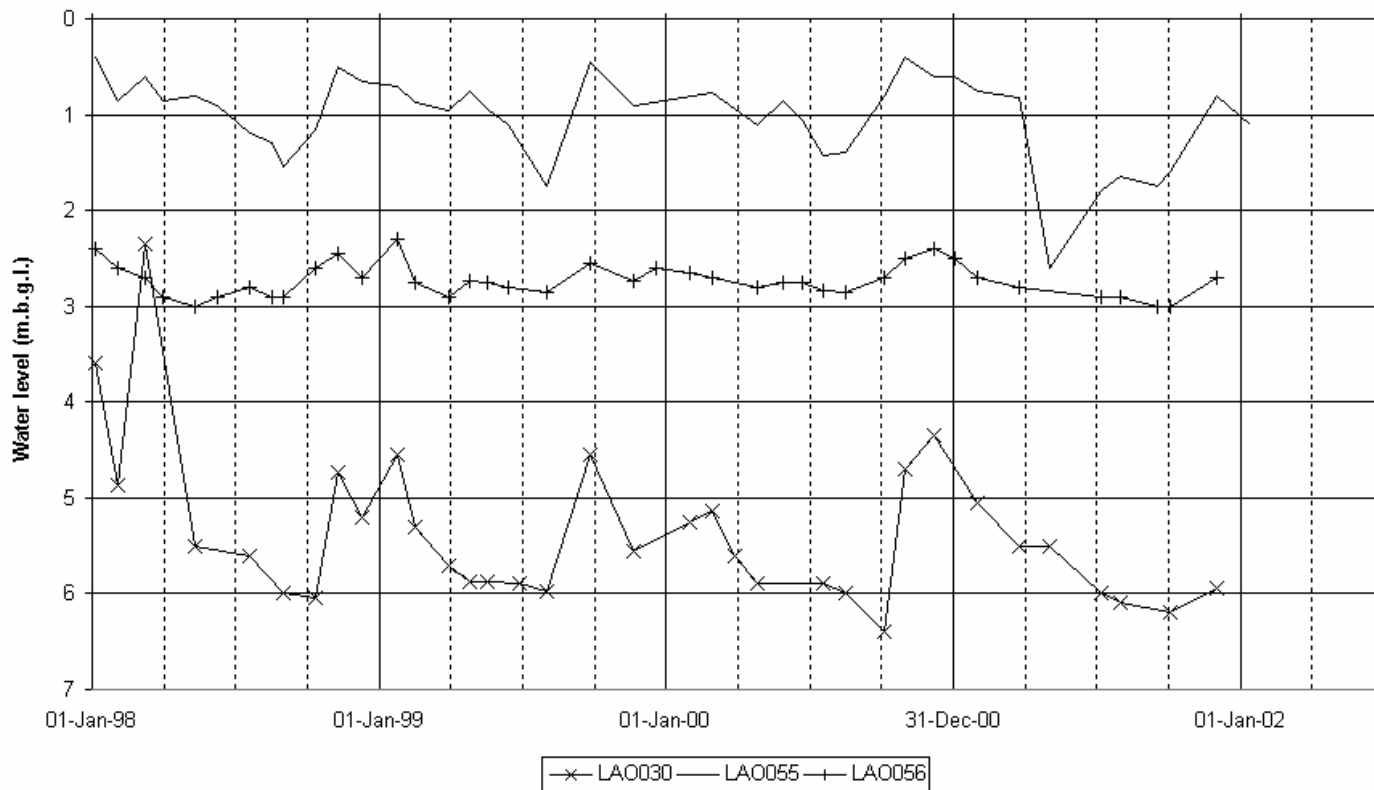
### EPA Well Hydrographs for Carlow



### EPA Well Hydrographs for Kildare



### EPA Well Hydrographs in Laos



### EPA Well Hydrographs in Laos

