Newtown GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km^2)
15 Nore & 14 Barrow Laois Kilkenny Carlow Co Cos		Dinin, Clogh, Castlecomer Stream, Coolcullen.	None	121
Topography		This groundwater body is found on top of the Castlecomer Plateau. The term Plateau is perhaps tentative, as little of this area is actually flat. The elevation rises steeply from the Barrow valley in the east to elevations of 330m OD. The broad north-south ridge of elevated land then drops off more slowly to the east, particularly towards the Dinin River. Surface drainage from this groundwater body radiates out in all directions to the Nore and Barrow Catchments.		
Geology and Aquifers	Aquifer type(s) Main aquifer lithologies	**Pu** – Poor Aquifer, generally unproductive CQ - Coolbaun Formation - A Cyclic repetition of shale, sandstone, seatearth and coal		
	Key structures.	The Castlecomer Plateau is a large elevated structural basin. The rocks were folded by the Variscan Orogeny (c. 300 million years ago). The main compression was east-west which created north-south trending folds, but the rocks at the northern and southern ends of the plateau dip towards the center, thus creating the basin-like structure. The folding also created two major sets of faults along ENE-WSW and NNW-SSE directions. D. Daly et al (1980) demonstrated that some faults act as barriers to groundwater flow, while other enhances groundwater flow.		
	Key properties	No information is available on the hydrogeological properties of this groundwater body. Estimated transmissivities can be considered to range 1 – 6m^2/d.		
	Thickness	The thickness of this groundwater body is considered to be that distance from the top of the Coolbaun Formation to the underlying sandstone aquifer. The thickness ranges from over 250 metres to 0m where it pinches out at the perimeter of the plateau.		
Overlying Strata	Lithologies	Glacial till derived from limestone. There are deposits of Alluvium along river channels, which can be quite deep and may contain gravel layers.		
	Thickness	Thickness of subsoil varies from 0 to >10m and generally increases towards the centre of this groundwater body.		
	% area aquifer near surface	There is a relatively high percentage - around 40% of the area has rock less than 1m from the surface.		
	Vulnerability	There is mixed vulnerability over this groundwater body. The overall area is EXTREME but within this are two large areas of LOW vulnerability, one to the north of Castlecomer town and a smaller one to the east. There are also large areas of rock close to surface.		
Recharge	Main recharge mechanisms	The superficial cover over the bedrock is generally less than 5 metres thick. However, the low permeability of the bedrock will impede recharge..		
	Est. recharge rates	*[Information will be added at a later date]*		
Discharge	Springs and large known abstractions	Clogh/Castlecomer RS (IG - 820), Carlow WS (Ardnataggle (LAO)Spring - 909), Muckalee Co-Op (20), Castlecomer Yarns,		
	Main discharge mechanisms	The main discharge areas from this aquifer are to the overlying streams. Most groundwater flow will occur in the uppermost weathered layers of the bedrock.		
	Hydrochemical Signature	The bedrock strata of this groundwater body are **siliceous**. The groundwater has a magnesium bicarbonate signature. The groundwater is "moderately hard" and has typical electrical conductivity of around 550 µs/cm.		
Groundwater Flow Paths		Groundwater flow paths in this area are considered to be short because the bedrock is not considered to constitute a major aquifer. Therefore it is likely that most groundwater flow circulates in the upper few metres, recharging and discharging in local zones. The age of the groundwater is considered to be young.		
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		The area consisting of the Coolbaun Formation defines the extent of this groundwater body. This rock is considered to be a generally unproductive aquifer. The most groundwater flow will occur closest to the surface where recharge and discharge take place in the same area. The age of groundwater in this area will be young but increasing in age with depth where groundwater circulation is much slower. This groundwater body confines the underlying Castlecomer GWB, which is a mare productive sandstone aquifer. Wells drilled within the Newtown GWB will intercept the Clay Gall Sandstone formation at the base of the Coolbaun Formation. Many of these well will have and artesian flow from them.		

Attachments	(Fig 1) Durov Plot of Chemical Data
Instrumentation	Stream gauge: 15019, 15036, 15017, 15016, 15013 Borehole Hydrograph: none EPA Representative Monitoring boreholes: Swan (#28 – S564824), Castlecomer Yarns (#40 – S536733)
Information Sources	Daly, D., Lloyd, J.W., Misstear, B.D.R., & Daly, E.P., 1980. Fault control of groundwater flow and hydrochemistry in the aquifer system of the Castlecomer Plateau, Ireland. Quarterly Journal of Engineering Geology, London, vol. 13, pp 167-175. Misstear, B.D.R., Daly, E.P., Daly, D., & Lloyd, J.W., 1980. The groundwater resources of the Castlecomer Plateau. Geological Survey of Ireland, Report Series RS 80/3.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae