

Ballymore Eustace GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority		Associated surface water bodies	Associated terrestrial ecosystems	Area (km ²)
Kildare Co. Co. Hydrometric Area 09		Liffey	Liffey Valley Meander Belt (393)	5
Topography		This GWB is located in east Co. Kildare around the town of Ballymore Eustace. The overall topography of the area has elevations reducing from Tipperkevin (around 180 m OD in places) in the northeast of the GWB towards the River Liffey (120 m OD) in the southwest. The land surface is quite hummocky in places exception for a rather flat area in the northeast. In general elevations fall towards the River Liffey.		
Geology and Aquifers	Aquifer type(s)	Lg: Locally Important Gravel Aquifer		
	Main aquifer lithologies	Sand and Gravel		
	Key structures.	N/A		
	Key properties	Though permeability testing data are limited, productivity, borehole logging and quarry data indicate that coarse material predominates and that permeability and storativity in the aquifer are high.		
	Thickness	By definition (DELG/EPA/GSI, 1999) this gravel deposit must be at least 10m thick. Drilling evidence from Kildare suggest the thickness of this deposit varies from 10 - 30 m		
Overlying Strata	Lithologies	There is an area of alluvium deposits in the northern are of the aquifer, which occupy the low-lying portion of the area. The gravel deposits either side of this is considered as one because it is assumed that they are connected beneath the narrow stretches of alluvium that separate them on the surface.		
	Thickness	Shallow		
	% Area aquifer near surface	High		
	Vulnerability	High		
Recharge	Main recharge mechanisms	This GWB is recharged from rainwater percolating through the topsoil and unsaturated sand and gravel deposits. Surface runoff from such gravel aquifers is considered to be low and no more than 20% of effective rainfall. The presence of less permeable layers in the deposit, even if thin, can create perched water tables and prevent recharge of the true water table. Where the water table lies below the local river network it is likely that some stream water may pass into the aquifer. This will be most likely in the higher elevations where a river flows onto the aquifer from where it has previously been flowing over impermeable subsoil or bedrock.		
	Est. recharge rates	<i>[Information to be added at a later date]</i>		
Discharge	Springs and large known abstractions	No known large abstractions. A number of small springs are located in the north of the aquifer, which appear to occur at a break in slope where the elevations level off from the northeast. The streams produced by these springs disappear after a short distance.		
	Main discharge mechanisms	Groundwater will leave this aquifer where the water table is above river stage and a permeable riverbed exists. There is also likely to be groundwater seepage from the extremities of the gravel body at the lower elevations, which may appear as springs, seeps or a rise in baseflow to a river. Water may also come to the surface where there is a boundary to groundwater flow i.e. an impermeable layer of till within the gravel deposit. There are a number of springs recorded in the north of the GWB, which are located at a break in slope along the foothills of the Wicklow Mountains.		
	Hydrochemical Signature	There is no information on the hydrochemical nature of the groundwater.		
Groundwater Flow Paths		Although the aquifer is permeable groundwater velocity is slow because storativity in the aquifer is high and water table elevations are generally subdued. This also means that discharge to rivers will not be flashy and will be sustained through drier periods of the year.		
Groundwater & surface water interactions		The “ Liffey Meander Valley Belt ” is located on the north bank of the River Liffey, about 1 km west of Ballymore Eustace. In this area the Liffey meanders through a broad flood plain bordered in places by steep slopes. A calcicolous seepage line along the base of the slope is included within the site, which would indicate groundwater discharging from the gravel aquifer to the north. The site contains ashwood, which merges into a dense growth of Lesser Pond-sedge, which grows with Marsh Marigold, Yellow Iris, Meadowsweet, Golden Saxifrage, and the Rushes. Important chironomid communities have been recorded from this area. This site is of scientific interest as ashwoods and marshy areas of this type are rare in Co Kildare		

Conceptual model	<p>This GWB is located around the town of Ballymore Eustace in east Co. Kildare. The general topography is quite varied with elevations falling from around 180 m OD in places in the north to 120 m OD in the south towards the River Liffey. The extent of the body is defined by the presence of gravel deposits in excess of 10m thick; in the south the contact with the River Liffey is taken as the boundary. The GWB is composed of permeable sand and gravel deposits with a high storativity. Recharge occurs diffusely through the overlying topsoil. The aquifer is generally unconfined, but may become locally confined where lower permeability deposits overlie the gravels. The water table within gravel aquifers is usually flat and therefore the depth to water will depend on the topography of the area. The flow paths within the aquifer are constrained by the extent of the deposit and therefore will not develop to a regional scale. Groundwater discharge will occur via springs and seeps along the lowest boundary of the body and also along river courses. There may also be discharge to rivers as baseflow where the water table lies above the river stage. There is a dependent ecosystem overlying the aquifer and the interaction between the groundwater such habitats should be examined closely. It appears the calcareous discharges from the gravel aquifer have a significant importance for this habitat.</p>
Attachments	
Instrumentation	<p>Stream gauge: None Borehole Hydrograph: None EPA Representative Monitoring boreholes: None</p>
Information Sources	<p>DELG/EPA/GSI (1999) <i>Groundwater Protection Schemes</i>. Department of Environment & Local Government, Environmental Protection Agency & Geological Survey of Ireland, joint publication. Kelly C, Fitzsimons V (2002) <i>County Kildare Groundwater Protection Scheme</i>. Report to Kildare County Council. Geological Survey of Ireland 55pp</p>
Disclaimer	<p>Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae</p>

