Timahoe GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water bodies	Associated terrestrial ecosystems	Area (km^2)
14 – Barrow Laois Co Co	Stradbally, Crooked		12.5

Topography		The northern part of the topographic catchment lies between 90 and 120 metres (300-400 ft) above sea level on very level or gently undulating land. Towards the south the topography slopes steeply upwards to Fossy Mountain which reaches over 300 m (1,000 ft) and forms part of the northern scarp of the Castlecomer Plateau.
Geology and Aquifers	Aquifer type(s) Main aquifer lithologies	**Lg** : Locally Important Sand/Gravel Aquifer **Sand and Gravel.** The subsoils of the area consist of esker sands and gravels, limestone sands and gravels, tills and alluvium. The Timahoe Esker is a prominent feature, traversing a sinuous course from east to west, but much of the esker has been removed by gravel working. The deposits consist of clean, well-sorted sands and gravels showing layering, channel features and imbrication. Layers of very fine sand were noted at one locality.
	Key structures.	
	Key properties	No site-specific data are available but permeability tends to be high in sand & gravels, often in the order of 20-70 m/d. Conservative estimates of the porosity of sand & gravel aquifers tend to be about 0.07-0.08, based on porosity values other parts of the country.
	Thickness	The thickness of the gravel deposit varies over its area but it is only considered to be a gravel aquifer, and hence a groundwater body, where that thickness exceeds 10m.
Overlying Strata	Lithologies	None
	Thickness	
	% area aquifer near surface	HIGH
	Vulnerability	HIGH
Recharge	Main recharge mechanisms	The subsoils are dominated by gravels, which have high rates of infiltration. This is supported by the free draining nature of the land. Therefore recharge is generated from rainfall that falls directly on the groundwater body. The proportion of runoff generated from effective rainfall is estimated to be less than 20%.
	Est. recharge rates	*[Information to be added at a later date]*
Discharge	Springs and large known abstractions	Rathineska G.W.S. (182 m^3/d), Orchard Spring (250 m^3/d), Kyle Spring (5,000 m^3/d). The underlying karstified limestone supports the discharge of Kyle spring.
	Main discharge mechanisms	The dominant types of discharge mechanisms in this groundwater body are likely to be baseflow to streams and seepages at the extremities of the sand and gravel deposit. The springs are likely to occur at a point where the ground slope becomes very gentle or where the subsoils change from gravels to peat or boulder clay downstream.
	Hydrochemical Signature	The deposits in this aquifer are **Calcareous**. The hydrochemical analyses of Kyle Spring show the water is moderately hard (318 mg/l $CaCO_3$) and has high electrical conductivity (~565 µS/cm). According to the limited chemical analyses water quality at Orchard Spring is very similar to that of Kyle. These values are typical of a carbonate aquifer, suggesting relatively long residence times.
Groundwater Flow Paths		Water levels are close to the ground surface in the vicinity of the springs. Water levels elsewhere are considered to be in the region of 3-7 m below ground level. Groundwater gradients in sand & gravel are expected to be quite flat. Data from other parts of the country indicate that gradients in gravel aquifers are in the order of 0.002 to 0.004. Groundwater flow through the aquifer is diffuse. The direction of groundwater flow will be towards the tributaries of the River Barrow in the north.
Groundwater & surface water interactions		Kyle Spring lies in an extensive alluvial flat, which is drained by two main canalised streams: the Crooked River drains the eastern side of the flat, and the Timahoe/Bauteogue River drains the western side (west of the Timahoe - Stradbally road). The spring itself discharges into an unnamed stream, which runs parallel to the Crooked River and then joins it about 1km north of the spring. North of Timogue Bridge, Crooked River becomes the Timogue River. Just south of Stradbally, the Bauteogue and Timogue join to become the Stradbally River. The streams which cross the alluvial flat flow in artificial channels of considerable age. Therefore these streams are not in hydraulic connection with the gravel/limestone aquifer in this area.
Conceptual model		The groundwater body is considered to be a locally important gravel aquifer. There are no overlying deposits and therefore a high proportion of effective rainfall will infiltrate through the permeable deposits to the water table. This also means that the vulnerability of the groundwater resource is high. The groundwater flow will be diffuse and the direction of groundwater flow is to the northeast. The groundwater body will discharge as baseflow to the associated surface water bodies and also as seepages and springs.

Attachments	
Instrumentation	Stream gauge: None Borehole Hydrograph: None EPA Representative Monitoring boreholes: None
Information Sources	Daly EP (1983) Water in the Landscape: Groundwater Resources in Laois. In: "Laois, an environmental history". Ed. Feehan J. Ballykilcavan Press. Deakin J, Fitzsimons V, Gately C, Wright G (2002) *County Laois Groundwater Protection Scheme.* Geological Survey of Ireland. McHugh M, Wright G (2002) *Kyle & Orchard Springs (Stradbally, Ballylynan & Timahoe Public Water Supplies) Groundwater Source Protection Zones*. 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