Narraghmore GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water bodies	Associated terrestrial ecosystems	Area (km2)
14 – Barrow Kildare Co Co	Greese, Bothoge		28

Topography		It is a relatively long, narrow and sinuous deposit, trapped between the foothills of the Dublin-Wicklow mountains to the east and Bullhill and Old Kilcullen to the west. To the west the land rises to a north-south ridge in Narraghmore Demesne, rising to about 140 m O.D. To the southeast the highest hill in the area occurs in Boleybeg, named Nine Tree Hill (168 m O.D.).
Geology and Aquifers	Aquifer type(s) Main aquifer lithologies	Lg: Locally Important Sand and Gravel aquifer. Sand & Gravel.
	Key structures.	
	Key properties	No site-specific data are available but permeability tends to be high in sand & gravels are 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 portion of this deposit with an interpreted depth of over 10m occupies an area of considerably more than 10 km^2. Generally, depth to bedrock is >10 m in the vicinity of the seven springs source. Further west the depth to bedrock decreases significantly and there are areas of shallow rock and outcrop.
Overlying Strata	Lithologies	N/A
	Thickness	N/A
	% area aquifer near surface	High
	Vulnerability	Areas of EXTREME vulnerability are constrained to where the depth to the saturated zone is less than 3m. HIGH vulnerability areas are distributed over the rest of the sand & gravel.
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. Recharge is generated from rainfall directly on the groundwater body. The proportion of runoff generated from effective rainfall is estimated to be in the order to 20%.
	Est. recharge rates	*[Information will be added at a later date]*
Discharge	Springs and large known abstractions (m^3/d)	There is a large group water scheme located in this portion known as the Lipstown-Narraghmore Group Water Scheme. The yield of this spring is in the order of 1300-1800 m^3/d, which under the GSI classification for spring yields is an "Intermediate" sized spring. Avonmore Creameries (Ballitore - 10)
	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 seven springs source occur at a point where the ground slope becomes very gentle and where the subsoils change from gravels to peat downstream.
	Hydrochemical Signature	The deposits in this aquifer are **Calcareous**. The hydrochemical analyses show that the water is moderately hard, with total hardness values of 160mg/l (equivalent $CaCO_3$) and EC values of 645-720 µS/cm, typical of limestone rock units or sand & gravel deposits. No limestone rock units occupy the area around Narraghmore, suggesting that the groundwater is mostly derived from the sand & gravel aquifer which is mapped at the source.
Groundwater Flow Paths		Water levels are close to the ground surface in the low-lying area around the springs. Water levels elsewhere appear 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. The hydrogeological data near the spring suggest local gradients are in the order of 0.02-0.002.
Groundwater & surface water interactions		Baseflow figures are obtainable for the River Greese in this area from EPA river flow measurements taken at Ballitore River Gauge and are calculated to be approximately 2.0 l/sec/km, a figure that is interpreted to reflect contributions from the sand & gravel deposits during summer periods.
Conceptual model		This groundwater body is a gravel aquifer located in south Kildare, east of the Barrow, considered to be a locally important aquifer. The groundwater is at least highly vulnerable because there are no overlying subsoils and the gravels are permeable. Groundwater flows in a diffuse manner. A series of springs discharging from the groundwater body are used as a public groundwater source. It is likely that the seasonal and annual fluctuations in flow from the seven springs are quite narrow, demonstrated by well hydrographs in nearby sand & gravel aquifers which show a narrow range in the fluctuation of the water levels, generally in the order of 1-2 m

Attachments	
Instrumentation	Stream gauge: 14038 (1.9), 14057 Borehole Hydrograph: none EPA Representative Monitoring boreholes:
Information Sources	Kelly C, Fitzsimons V (2002) Lipstown - Narraghmore Group Water Scheme, 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