Duagh Gravel GWB: Summary of Initial Characterisation.

Hydrometric Area Local Authority	Associated surface water features	Associated terrestrial ecosystem(s)	Area (km^2)
23 Kerry Co. Co.	**Rivers**: Feale	Lower River Shannon SAC (O Riain, 2004)	4

Topo-graphy		An elongate (9 km) narrow (500 m wide) sand/gravel deposit occupies the River Feale river valley between Listowel and Abbeyfeale, orientated NW-SE, as shown in Figure 1. The river Feale flows in a northwesterly direction, flowing out of the Mullaghareirk Mountains. The deposit lies in a relatively flat low-lying area, situated at 30-50 m OAD. On either side of the river valley the slopes rise steeply to over 200 m OAD.
Geology and Aquifers	**Aquifer categories**	The sand/gravel deposit classified as a **Locally Important Sand and Gravel Aquifers (Lg)**. It is approximately 4 km^2 in area and is likely to have greater than 5 m of saturated sand/gravel in most parts of the deposit (DELG/EPA/GSI (1999). The aquifer is surrounded by the Abbeyfeale GWB, composed primarily of a Locally important aquifer which is moderately productive only in local zones (**Ll**).
	Main aquifer lithologies	Glaciofluvial sand/gravel deposits and alluvial sand/gravel deposits.
	Key structures	N/A
	Key properties	Yields of up 342 m^3/d are recorded from an infiltration gallery located near Duagh. Sand/gravel aquifers generally consist of unconsolidated coarse grained material, usually containing less than 8% fines (O'Suilleabháin, 2000) resulting in an intergranular porosity and relatively high permeabilities and storativity. Permeability is generally greater than 10 m/d (O'Suilleabháin, 2000). Typically transmissivity is generally greater, ranging from 200 – 1500 m^2/d. Groundwater is likely to be unconfined. The groundwater gradient is approximately 0.002. Storativity is expected to be high (10%). Specific dry weather flow is 0.54 $l/s/km^2$ upstream of the aquifer at Abbeyfeale (23006) and 2.31 $l/s/km^2$, downstream of the aquifer at Listowel (23002), indicating that the baseflow to the Feale increases four fold over a 13 km distance across a Namurian sandstones (Locally important aquifer). This contribution of baseflow to the Feale is probably from the sand/gravel aquifer and not from the Namurian sandstones.
	Thickness	The thickness of the sand/gravel deposit approximately 10 m.
Overlying Strata	**Lithologies**	Alluvium is extensive along the Feale river valley (Meehan, 2004).
	Thickness	The thickness of alluvium is generally less than 3 m.
	% area aquifer near surface	*[Further Information to be added at a later date]*
	Vulnerability	*[Further Information to be added at a later date]*
Recharge	**Main recharge mechanisms**	Diffuse recharge occurs via rainfall percolating through the unsaturated sand/gravel, from runoff from the hills on either side, and possibly from the Feale river itself.
	Est. recharge rates	*[Information to be added to and checked]*
Discharge	**Large springs and large known abstractions (m^3/d)**	*[Information to be added to and checked]*
	Main discharge mechanisms	Groundwater is expected to discharge to the Feale river. Flow gauges located just upstream and downstream of the aquifer, suggest that there is a significant contribution from the sand/gravel.
	Hydrochemical Signature	There are no data available, however alkalinity, hardness and conductivity are expected to be high. The groundwater is expected to have a calcium bicarbonate signature.
Groundwater Flow Paths		The length of flow paths depends on the size of the sand/gravel deposit and on local groundwater divides. locally important sand/gravel aquifers are expected to have relatively short flow paths, i.e., up to several hundreds of metres. The GWB is a long sinuous aquifer parallel to a river, thus flow paths are expected to be relatively short. Sand/gravel has an intergranular porosity, thus groundwater flow is diffuse. Groundwater flow directions are subparallel to the streams and main river valleys.
Groundwater & Surface water interactions		In general groundwater from sand/gravel deposits located in river valleys discharges to the streams/rivers flowing through the valley. Hydraulic connection between the groundwater in the aquifer and the river is expected to be high, thus water will be able move into and out of the aquifer depending on the river stage.

Conceptual model	• An elongate, narrow sand/gravel aquifer occupies the Feale river valley between Listowel and Abbeyfeale, orientated NW-SE. • The deposit lies in a relatively flat low-lying area, situated at 30-50 m OAD. • Transmissivities expected to be high. Storativity is expected to be high (10%). Groundwater is likely to be unconfined. • The groundwater gradient is approximately 0.002. • Water levels are close to ground level. • Diffuse recharge occurs via rainfall percolating through the unsaturated sand/gravel, from runoff from the hills on either side, and possibly from the Feale river itself. • Groundwater discharges to Feale. • Flow path lengths are expected to be relatively short, up to several hundred metres.
Attachments	Figure 1
Instrumentation	**Stream gauges:** 23002, 23006. **EPA Water Level Monitoring boreholes:** none **EPA Representative Monitoring points:** none
Information Sources	DELG/EPA/GSI (1999) *Groundwater Protection Schemes.* Department of the Environment and Local Government, Environmental Protection Agency and Geological Survey of Ireland. O'Suilleabháin, C., (2000). Assessing the boundary between high and moderately permeable subsoils. Unpublished MSc., University of Dublin. Department of Civil, Structural and Environmental Engineering, Trinity College Dublin. Meehan, R.T., (2004) *Subsoils Map for county Kerry*. Map produced as part of EPA Soil and Subsoil Mapping Project (formerly FIPS-IFS). Teagasc, Kinsealy.
Disclaimer	Note that all calculation and interpretations presented in this report represent estimations based on the information sources described above and established hydrogeological formulae

Figure 1 Location and boundaries of GWB