
Water Framework Directive Groundwater Monitoring Programme

Site Information **Banagher BH**

Banagher is a public water supply scheme which comprises a groundwater and a surface water input (Shannon). Groundwater is supplied through two adjacent boreholes with an abstraction of 700m³/day. The GSI have published a source protection report for the site.




Offaly


August 2011

SITE INFORMATION					
Site Name:	Banagher BH		County:	Offaly	
RBD:	Shannon IRBD		EU Reporting Code:	IE_SH_G_040_19_001	
Easting:	202841		GWB Name:	Banagher	
Northing:	214032		GWB Code:	IE_SH_G_040	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2500PUB1001	
Hydrometric Area:	25		Water Level Monitoring Network:	Level	Flow
Townland:	BALLYEIGHTER			N	N
Ownership:	Offaly County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	Banagher PWS is situated in a Locally Important Aquifer (LI) / Dinantian Pure Unbedded Limestone. The water supply is included in the GW surveillance monitoring network.				
SITE DIRECTIONS					
Location and Access Information:	Take R439 out of Banagher heading southeast; at a junction marked by a church with a high steeple take the left passing alongside the northeastern side of the church - called Middle Road. Drive for 1.6km and pumphouse is on right hand side adjacent to the road.				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	700	Ground Elevation (m OD):	55
Borehole Log Available:	---	Total Drilled Depth (m bgl):	61, 59	Depth to Bedrock (m bgl):	9, 14
Top of Casing (m agl):	1.35, 1.41 mbgl	Upper Casing Diameter (mm):	250, 250	Lower Casing Diameter (mm):	---
Final Borehole Depth (m):	---	Upper Casing Bottom Depth (m bgl) :	---	Lower Casing Bottom Depth (m bgl):	---
Screen Interval (m bgl):	---	Screen Type (PVC,Steel,other):	---	Screen Slot Size (mm):	---
Grout Type (cement,bentonite):	---	Grouted above (m bgl):	---	Grout Volume Injected (m³):	---
Gravel Pack Interval (m bgl):	---	Gravel Pack Volume (m³):	---	Open Hole Interval (m bgl):	---
Potential Yield (m³/day):	---	Comments on Monitoring Site:	The pumping alternates between the adjacent boreholes. Details for depth to bedrock, drilled depth, casing are for PW1 and PW2. Both boreholes are set below ground in concrete chambers.		
Specific Capacity (m³/d/m):	40,25				
Static Water Level (m bgl):	2-5				
Scheme Name:	Banagher WSS	Number of Abstraction Points in the Scheme:	2	Source Report Available	Y
Source Report Info:	Source report prepared by GSI.				
Scheme Summary:	The scheme comprises a groundwater and a surface water input (Shannon). Groundwater provides about 60% of the total demand through two boreholes, drilled in 1986. The boreholes are alongside each other, each in its own separate concrete lined chamber with a padlocked galvanised cover. The water is chlorinated at the pumphouse on site, and pumped to a reservoir at Mullaghakaraun.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep poorly drained mineral (BminPD)					Subsoil Permeability:	Moderate
	Subsoil:	Tills (diamictos) (TLs)						
	Bedrock:	Dinantian Pure Unbedded Limestones						
HYDROGEOLOGY	Aquifer Category:	LI	Vulnerability at Monitoring site:	Moderate		Flow Regime:	Poorly productive	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	1.71	ZOC Delineated By:	GSI		Recharge Estimate (mm/yr):	184	
	ZOC Delineation Comments:	ZOC delineated by GSI on the basis of geology, hydrogeological mapping and topography. See GSI report available from Groundwater Section at GSI.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	0.17	10.18	75.74	13.92	0	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 14 mg/l NO3 and the maximum nitrate concentration was 26 mg/l NO3. The average ammonium concentration was 0.021 mg/l N and the maximum ammonium concentration was 0.116 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.007 mg/l P and the maximum MRP concentration was 0.029 mg/l P. The average chloride concentration was 17.4 mg/l Cl and the maximum chloride concentration was 25 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	354	178-480						
Hardness (mg/l CaCO3):	Average:	Range:						
	417	322-478						
Conductivity (uS/cm):	Average:	Range:						
	777	601-851						
Monitoring Record Period:	From:	To:						
	1996	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	---			Typical Contaminants:	---			
Risk Category:	Not at risk, low confidence			GWB Status:	Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:	Low:	Negligible:			
	0.00	50.93	5.27	8.84	34.96			
OTHER INFORMATION								



Sampling Point



Pump House



Borehole

Data Summary Sheet - July 2011

Disclaimer: The data in this document are based on the best available information and understanding at time of writing. Neither the Environmental Protection Agency, nor the individual bodies supplying data for this document and accompanying maps will be responsible for any loss or damage from the use or interpretation of these data.

Rock Unit Geology Map: GSI, 2009

Aquifer Type Map: GSI, 2009

Groundwater Vulnerability Map: GSI, 2009

Soils & Subsoils Type: Teagasc, 2007

Recharge Map: GSI, 2009

Impact Potential Map: EPA, 2009

Risk Assessment Map: EPA WFD Risk Assessment, 2006

Groundwater Body Status: EPA WFD Status Assessment, 2008

Water Quality Data: EPA WFD Monitoring, 2008

Groundwater Threshold Values

Groundwater threshold values for selected parameters:

Nitrate - General Chemical Test/ Drinking Water Test (37.5 mg/l N03)

Ammonium - Drinking Water Test (0.175 mg/l N) / Surface Water Test (0.065 mg/l N)

Molybdate Reactive Phosphorus (MRP) - Surface Water Test (0.035 mg/l P)

Chloride -Saline/Intrusive Test (24 mg/l) / Drinking Water Test (175 mg/l Cl)

Electrical Conductivity -Saline/Intrusive Test (800 µS/cm) / Drinking Water Test (1,875 µS/cm)

Further information on groundwater threshold values is contained in the Groundwater Regulations (S.I. No.9 of 2010).

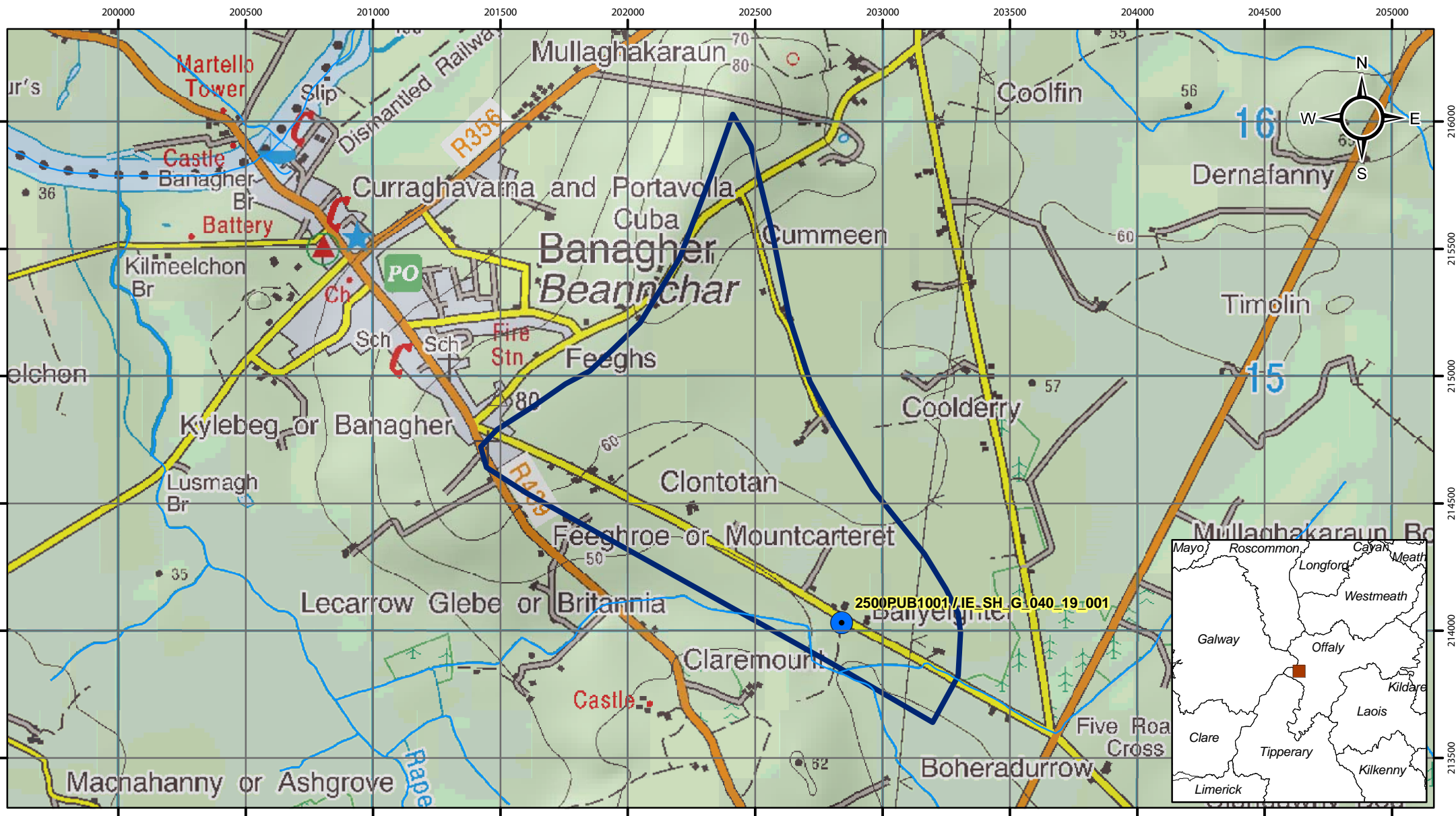
General Downgradient Distances

General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

Rk, Rkd, Lk	225 m
Lm	150 m
Ll, Pl	60 m

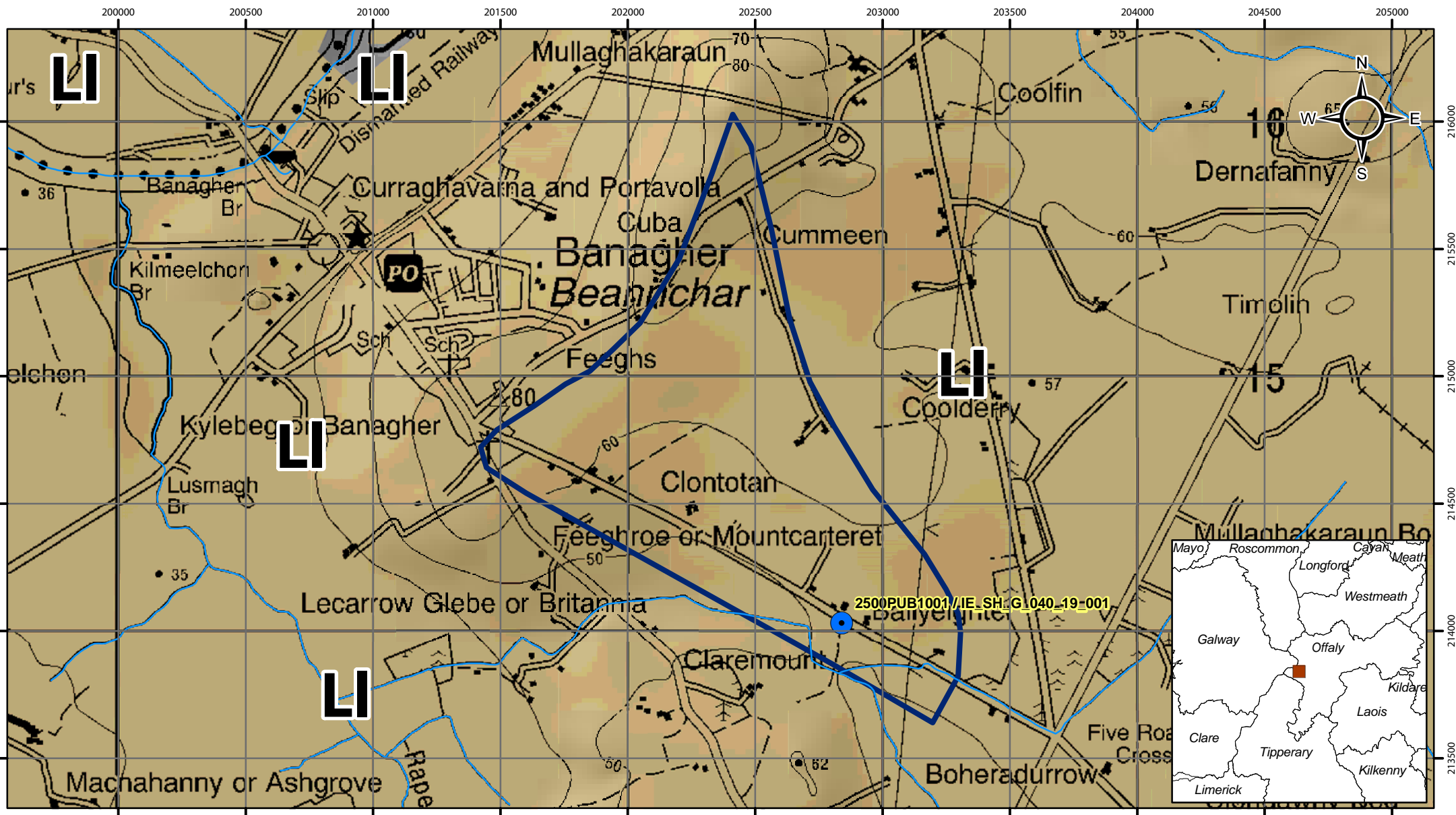
It is assumed that groundwater downgradient of a spring cannot flow back up to the spring, however a precautionary 30m buffer is generally applied which allows for instances where pumping under dry weather periods may induce a drawdown or where the ground may be sloping toward the spring from the downgradient side.

Version 0:	Prepared by	GSI	Date:	
Version 1:	Prepared by	Tobin (CK)	Date:	Apr 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	



Location Map for Banagher BH

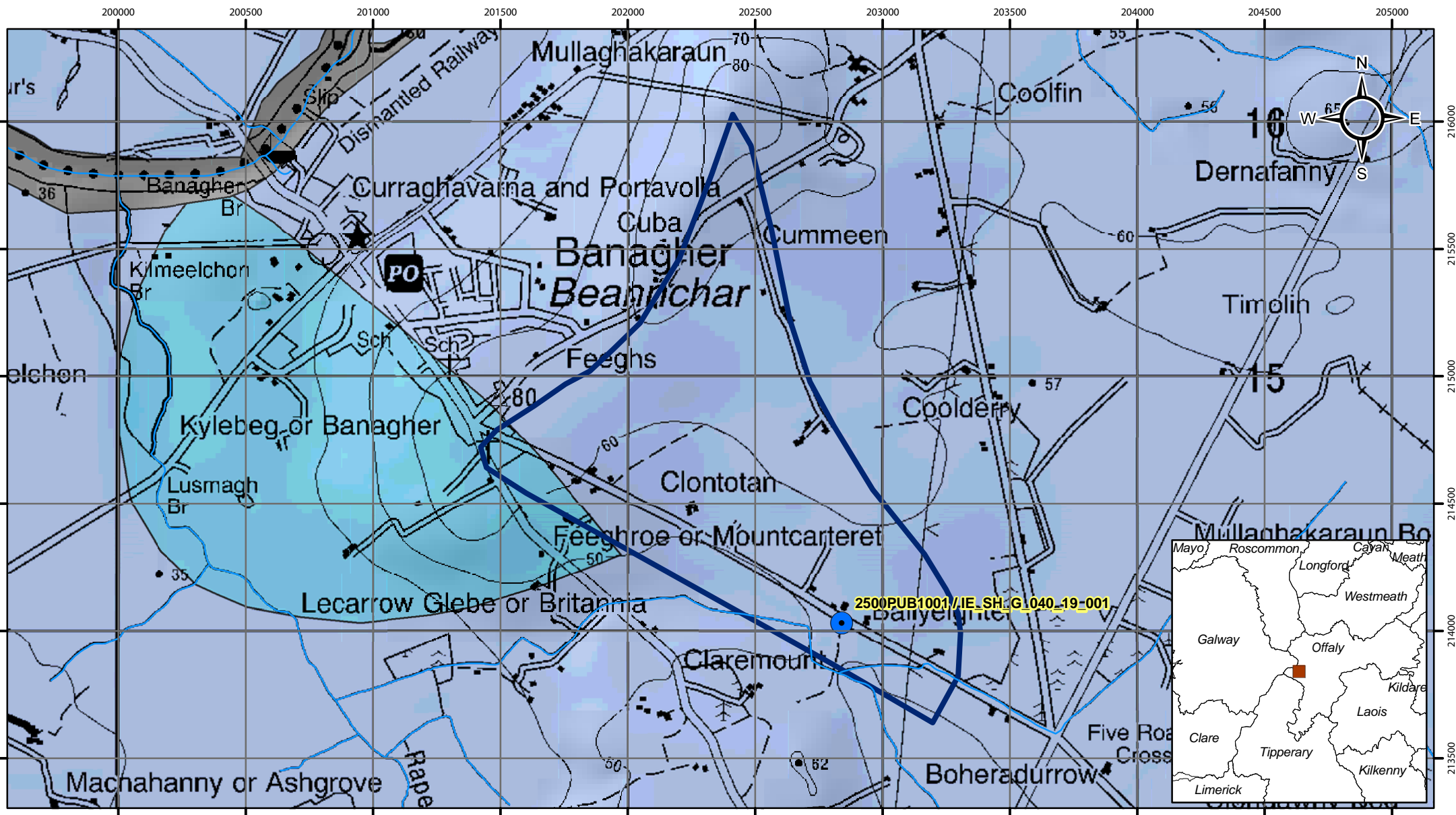
- Abstractions
- River
- Zone of Contribution



Aquifer Category for Banagher BH

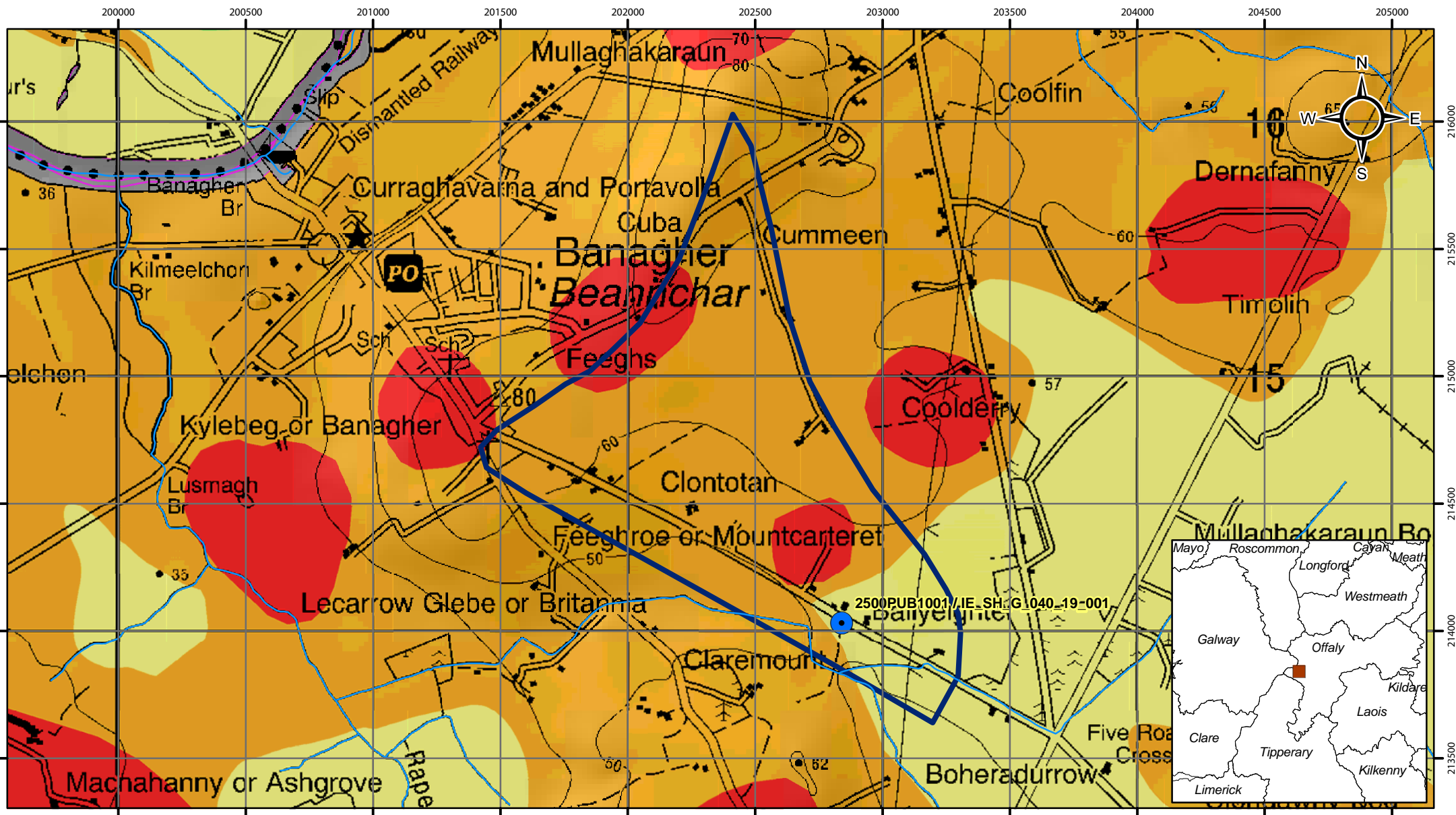
- Abstractions
- River
- Zone of Contribution

LI



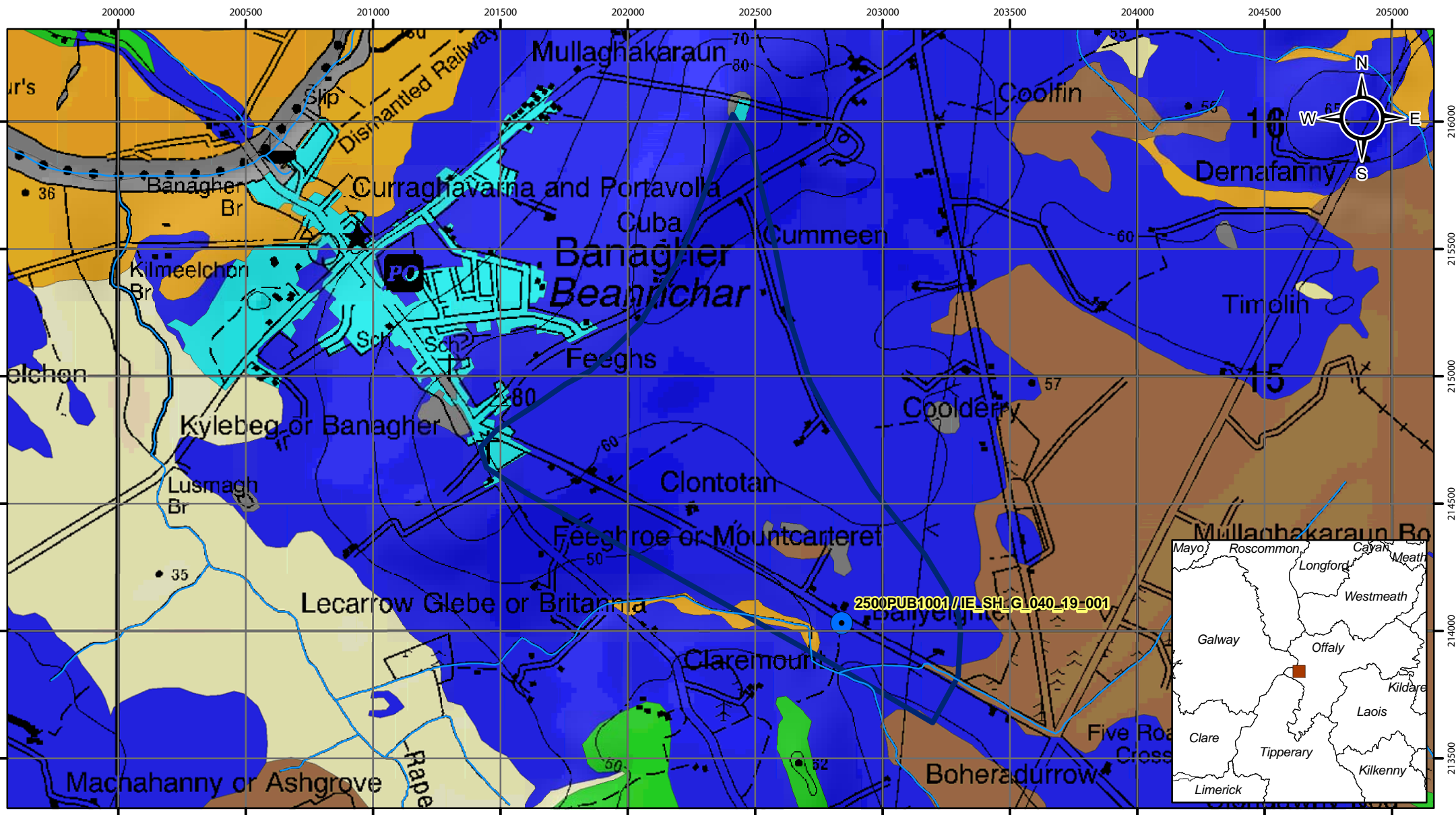
Bedrock Map for Banagher BH

- Abstractions
- River
- Zone of Contribution
- Dinantian Lower Impure Limestones
- Dinantian Pure Unbedded Limestones
- Dinantian Upper Impure Limestones

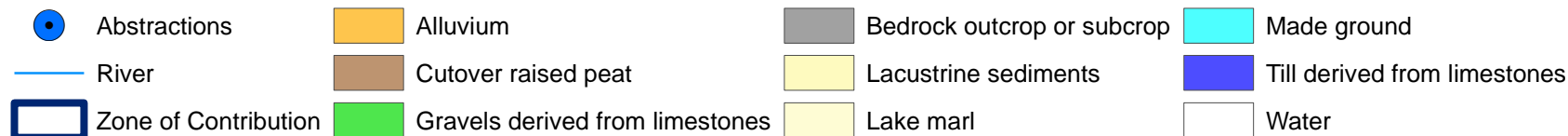


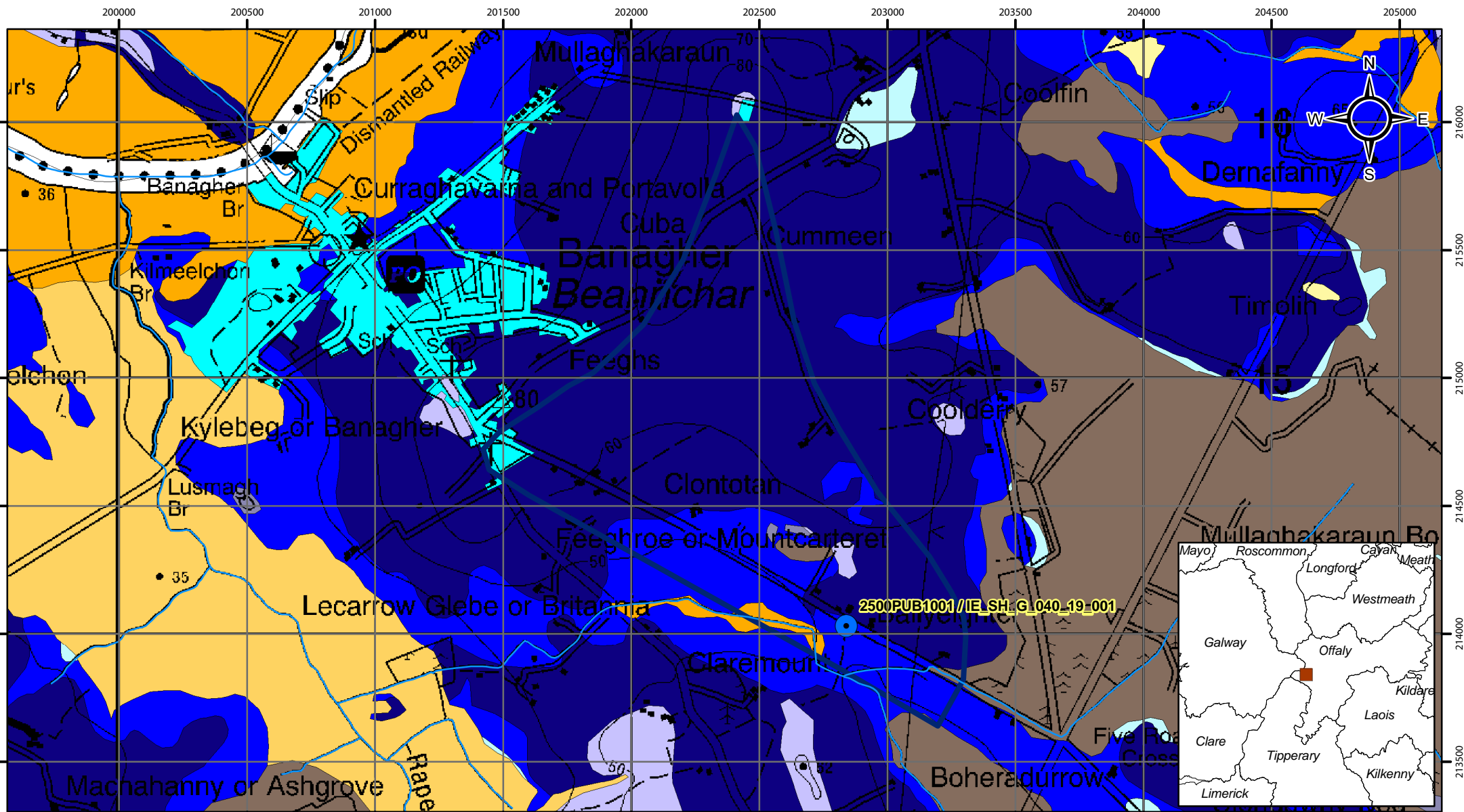
Groundwater Vulnerability for Banagher BH

- Abstractions
- River
- Zone of Contribution
- X (extreme - outcrop or rock close)
- E (extreme)
- M (moderate)
- L (low)
- H (high)
- Water



Subsoils Map for Banagher BH





Soils Map for Banagher BH

