

## Water Framework Directive Groundwater Monitoring Programme

### Site Information

### Bawnboy



Bawnboy is a borehole used as a public water supply. The abstraction rate is 233m<sup>3</sup>/day. The GSI prepared a source protection report in 2009.



Cavan

August 2011

SITE INFORMATION					
Site Name:	Bawnboy		County:	Cavan	
RBD:	NWIRBD		EU Reporting Code:	IEGBNI_NW_G_031_02_002	
Easting:	220818		GWB Name:	Newtown-Ballyconnell	
Northing:	318046		GWB Code:	IEGBNI_NW_G_031	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	0200PUB1007	
Hydrometric Area:	36		Water Level Monitoring Network:	Level	Flow
Townland:	KILSOB			N	N
Ownership:	Cavan County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	---				
SITE DIRECTIONS					
Location and Access Information:	The site is located approximately 1km south of Bawnboy in the townland of Kilsob. The site is accessed from a secondary road south of the village off the N87. This well has replaced older wells				
Additional Comments:	---				
WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	233	Ground Elevation (m OD):	136
Borehole Log Available:	---	Total Drilled Depth (m bgl):	42.7	Depth to Bedrock (m bgl):	10
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	400	Lower Casing Diameter (mm):	200
Final Borehole Depth (m):	39	Upper Casing Bottom Depth (m bgl) :	20	Lower Casing Bottom Depth (m bgl):	36
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):	39-42.7
Potential Yield (m³/day):	1706	Comments on Monitoring Site:	---		
Specific Capacity (m³/d/m):	117				
Static Water Level (m bgl):	3.8				
Scheme Name:	Bawnboy	Number of Abstraction Points in the Scheme:	1	Source Report Available	Y
Source Report Info:	Source report prepared by GSI in 2009.				
Scheme Summary:	The scheme consists of one borehole. The production well was originally a trial well but was found to provide and adequate supply and a pump was installed. It replaced a shallower borehole which could not meet the projected demand. The casing depth is 39m for a borehole with a total depth of 42.7m				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep poorly drained mineral (AminPD)					Subsoil Permeability:	Low
	Subsoil:	Unknown (TCSsCh)						
	Bedrock:	Dinantian Pure Bedded Limestones						
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	Low			Flow Regime:	Karstified
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	0.84	ZOC Delineated By:	GSI			Recharge Estimate (mm/yr):	145
	ZOC Delineation Comments:	The GSI delineated a ZOC based on abstraction, recharge and topography. See the source report for details.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	0.54	6.14	14.45	48.03	30.84	0	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 3 mg/l NO3 and the maximum nitrate concentration was 5 mg/l NO3. The average ammonium concentration was 0.018 mg/l N and the maximum ammonium concentration was 0.05 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.021 mg/l P and the maximum MRP concentration was 0.12 mg/l P. The average chloride concentration was 12.5 mg/l Cl and the maximum chloride concentration was 20 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	200	123-290						
Hardness (mg/l CaCO3):	Average:	Range:						
	212	102-368						
Conductivity (uS/cm):	Average:	Range:						
	422	297-492						
Monitoring Record Period:	From:	To:						
	1996	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:		Phosphate			
Risk Category:	At risk, high confidence		GWB Status:		Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:		Low:	Negligible:		
	0.00	0.00	6.21		93.79	0.00		
OTHER INFORMATION								
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Site Location



Borehole Cover



Well head

## 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 NO<sub>3</sub>)

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

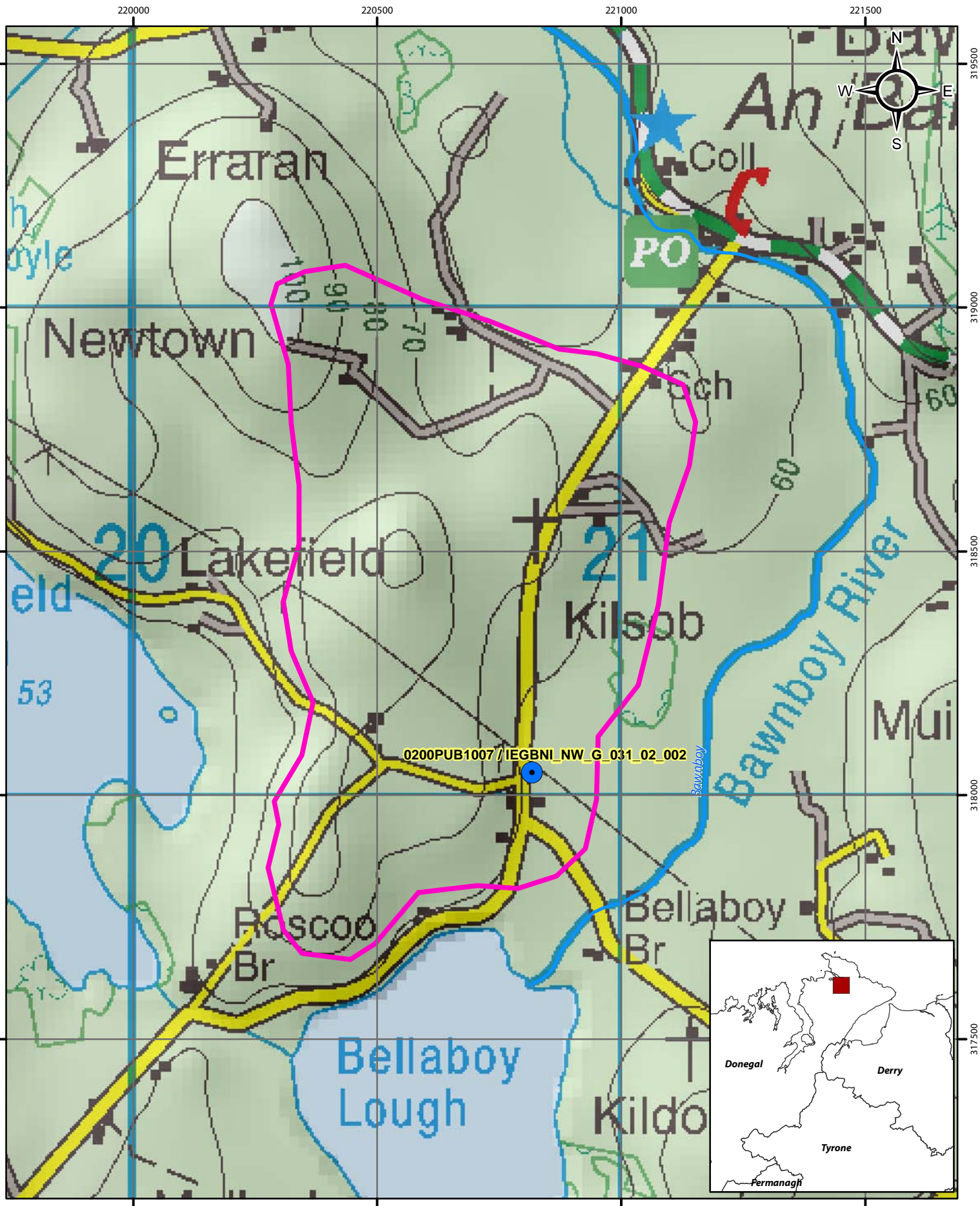
General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

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	OCM (DC)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

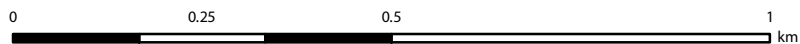




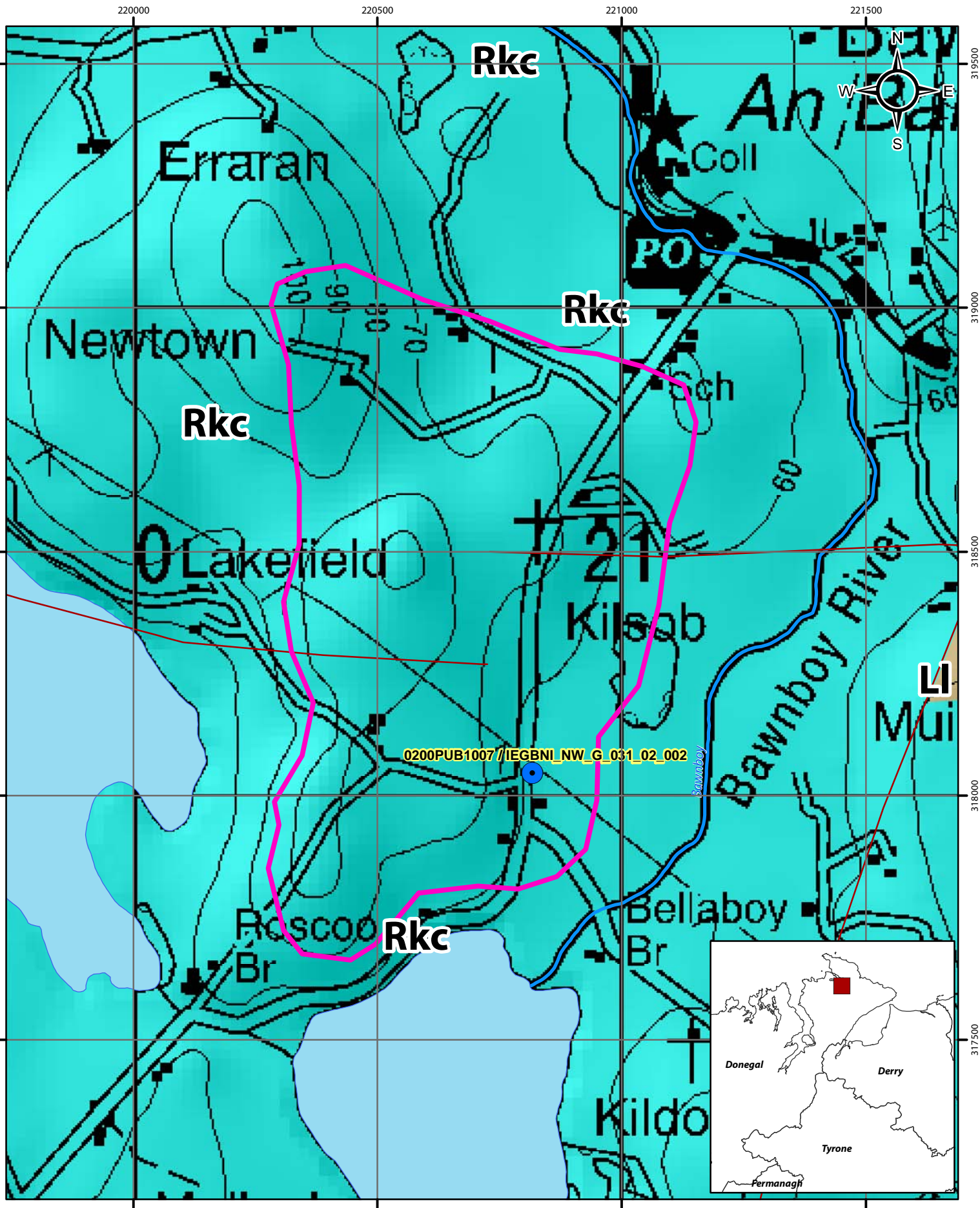
## Location Map for Bawnboy

-  Abstractions
-  River
-  Zone of Contribution








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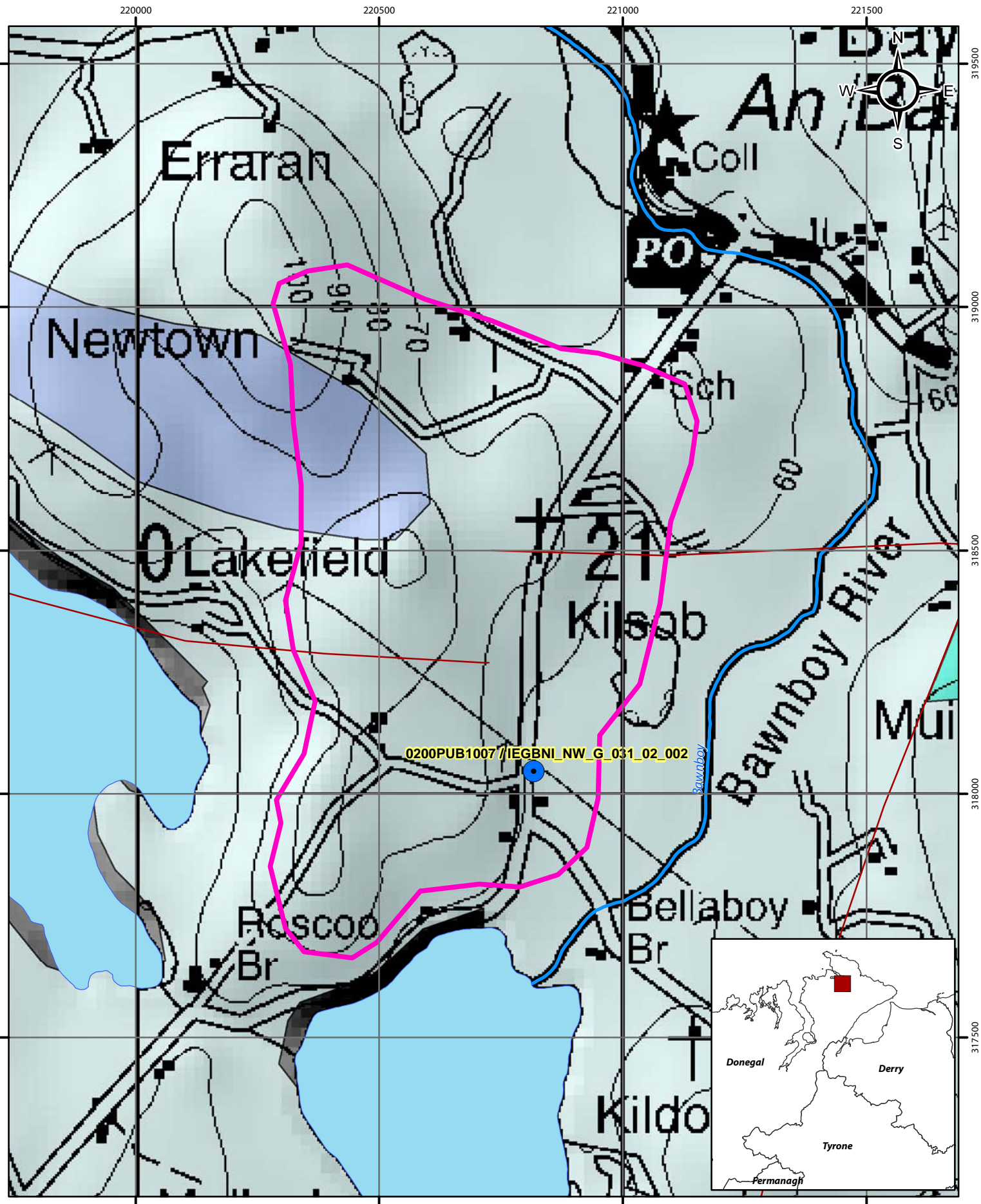
## Aquifer Category Map for Bawnboy

-  Abstractions
-  Lake
-  Fault
-  River
-  LI
-  Zone of Contribution
-  Rkc

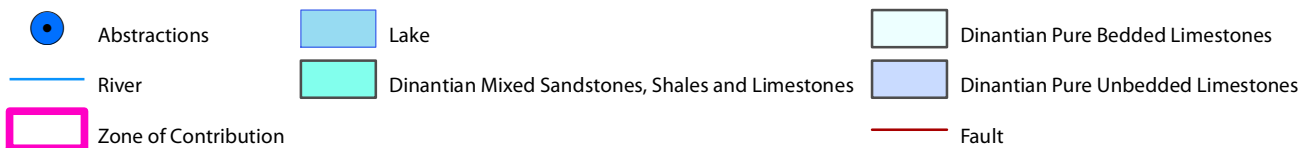
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0 0.25 0.5 1 km

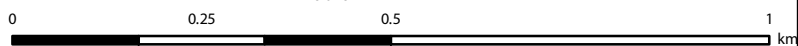




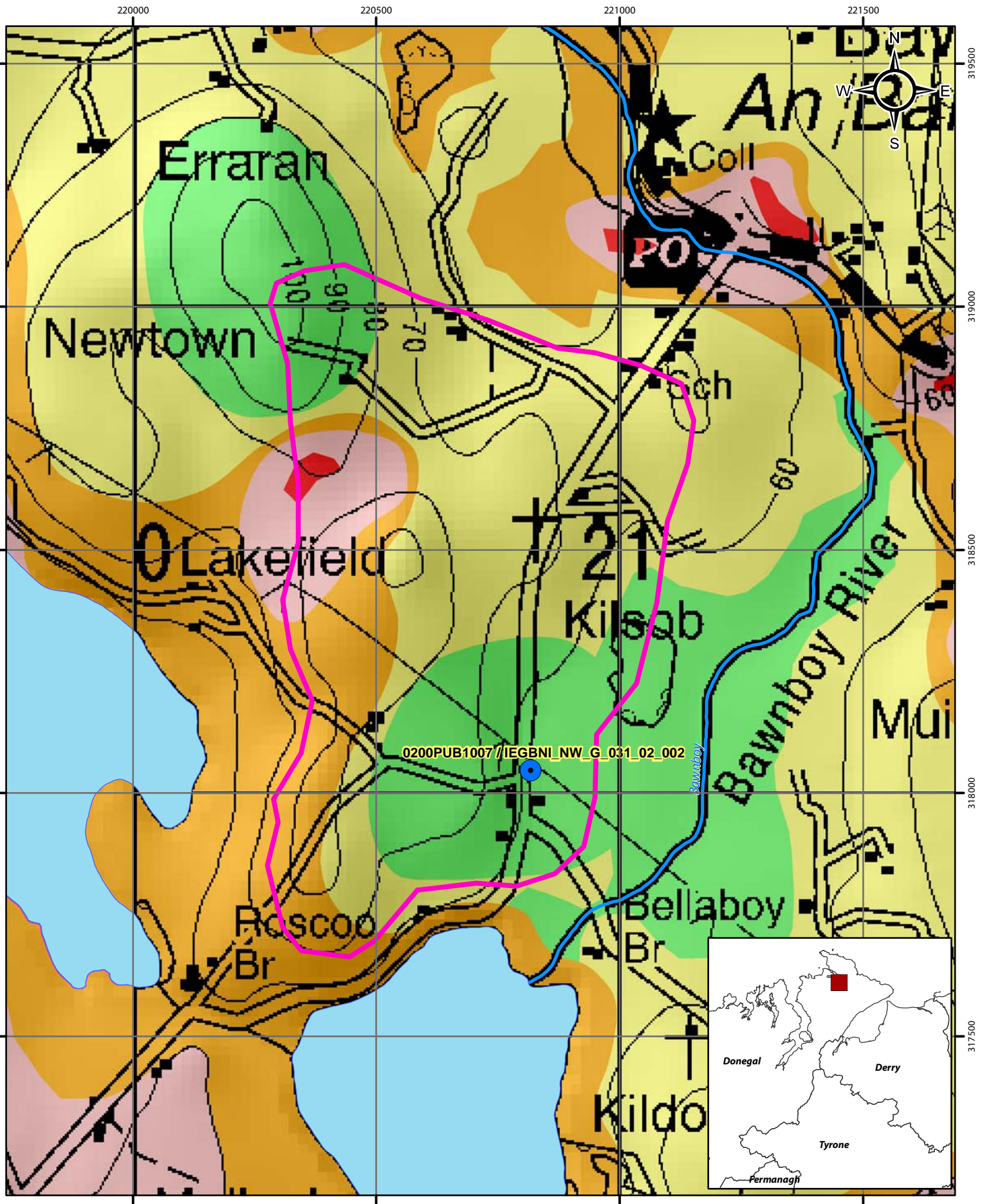
## Bedrock Map for Bawnboy



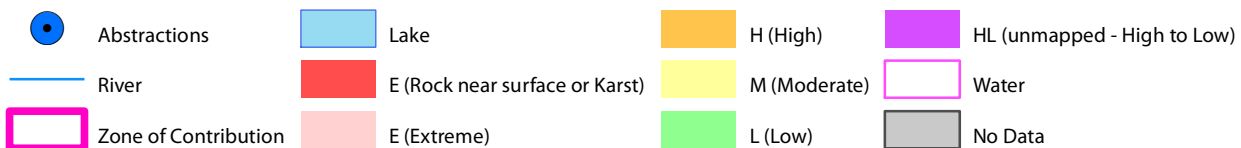
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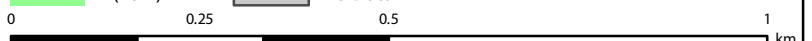




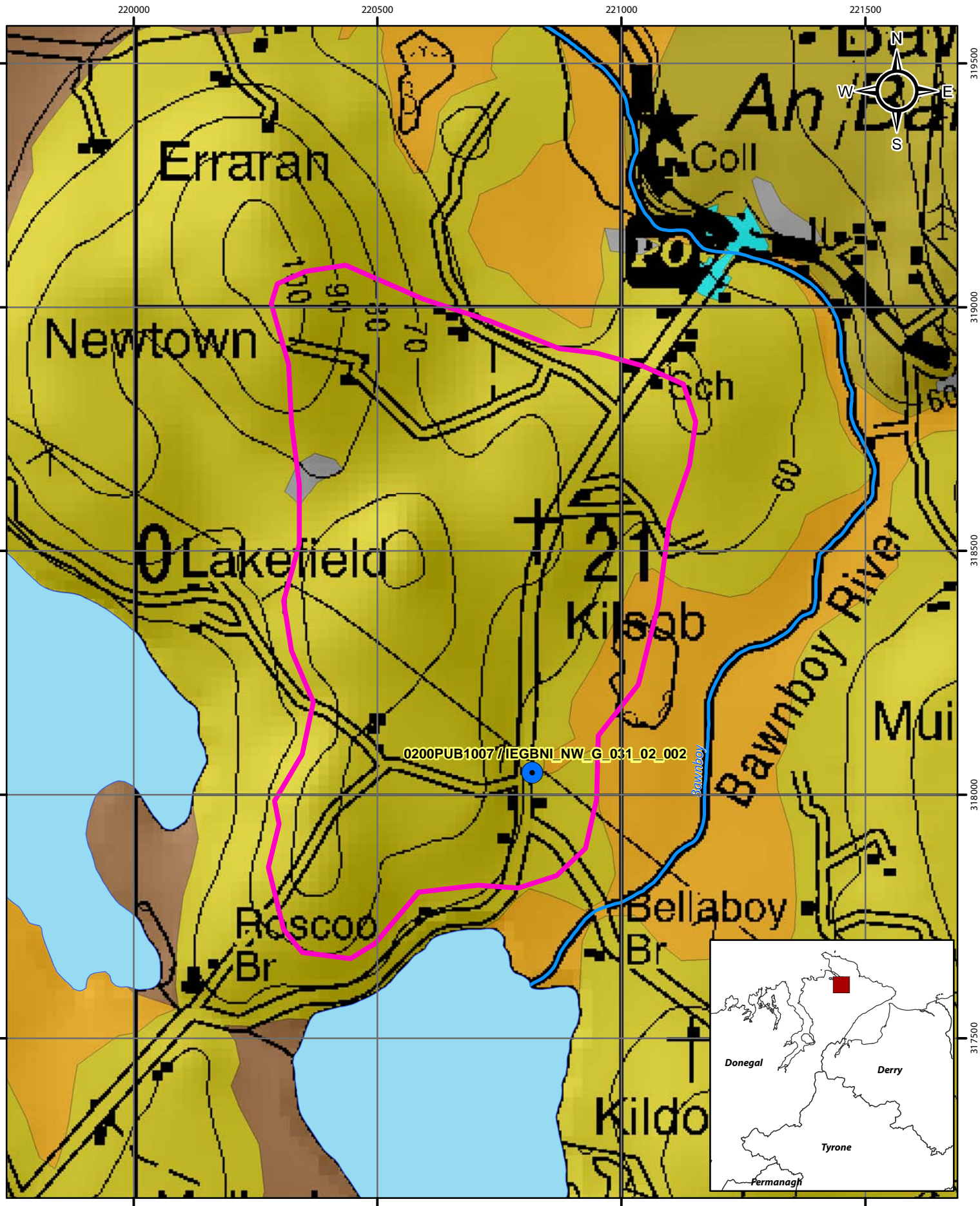
## Groundwater Vulnerability Map for Bawnboy



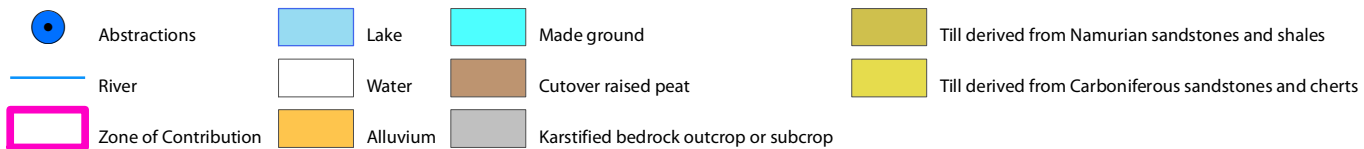
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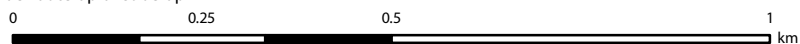




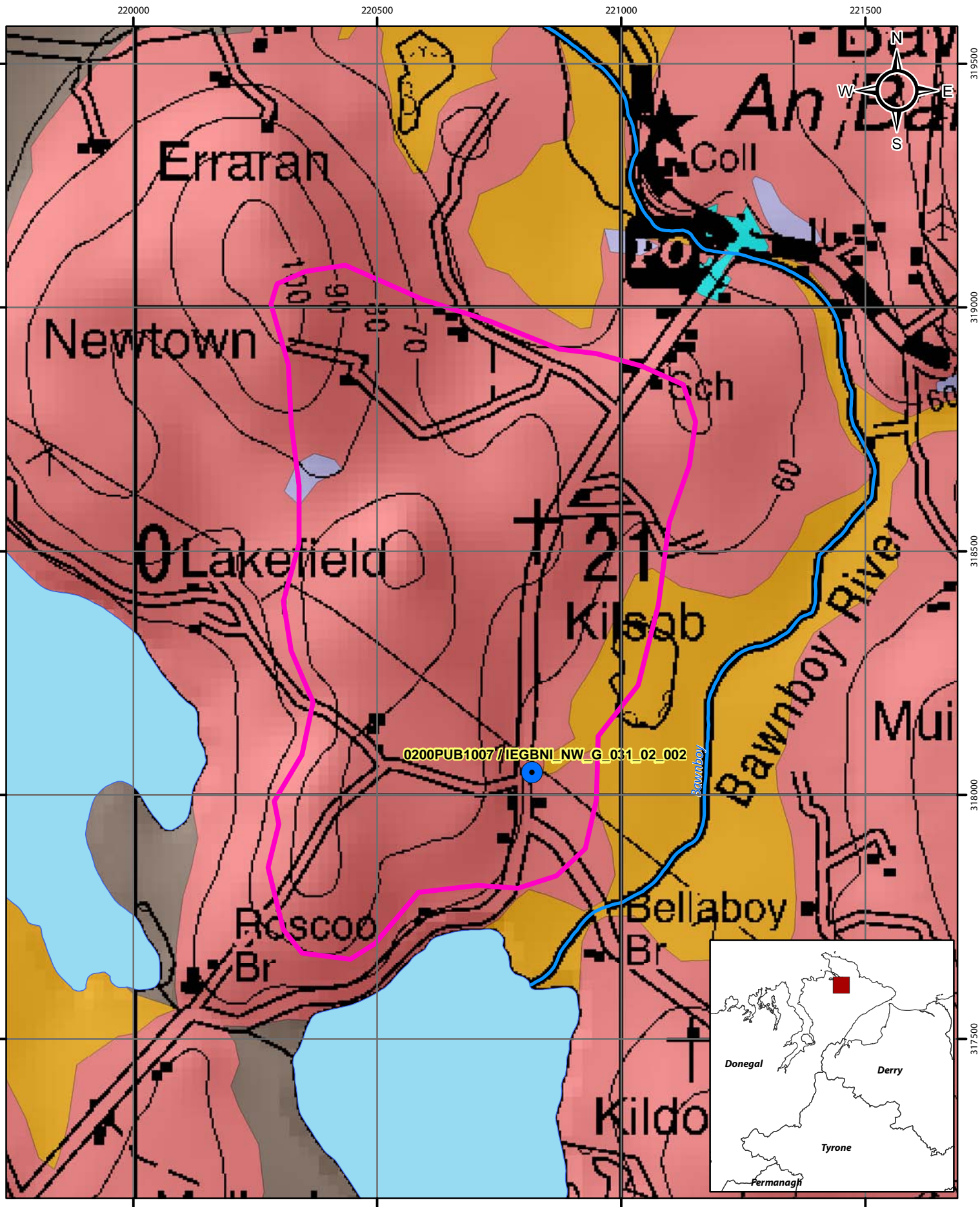
## Subsoils Map for Bawnboy



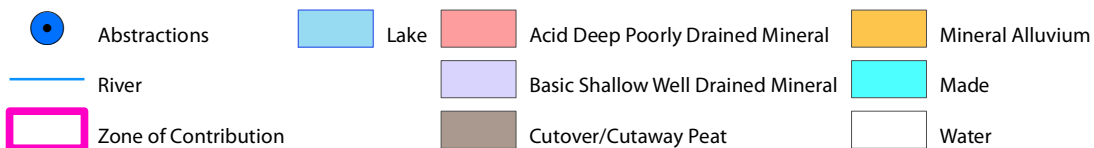
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## Soils Map for Bawnboy



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