

Water Framework Directive Groundwater Monitoring Programme

Site Information

Ballindine



Ballindine is a spring that was used for the town's water supply, but is now disused. This site is located in a karst limestone aquifer. The spring is included in the surveillance and operational monitoring networks. The spring has an estimated mean flow of 3,000m³/day.



Mayo

August 2011

SITE INFORMATION					
Site Name:	Ballindine		County:	Mayo	
RBD:	WRBD		EU Reporting Code:	IE_WE_G_0019_16_001	
Easting:	136208		GWB Name:	Cong-robe	
Northing:	269814		GWB Code:	IE_WE_G_0019	
Site Use:	Monitoring Only		Drinking Water Code:	---	
Hydrometric Area:	30		Water Level Monitoring Network:	Level	Flow
Townland:	BALLINDINE NORTH			Y	Y
Ownership:	Mayo County Council				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		Y
Site Comments:	Surrounded by grassland and peat, frequently flooded.				
SITE DIRECTIONS					
Location and Access Information:	Located 1km north west of Ballindine, off a minor road off the N17. The spring is located in a field approximately 100m from the road. The Local Authority has a right of way through adjacent field. The sample is taken from the overflow of the spring chamber.				
Additional Comments:	Ballindine - has been discontinued (June 2010). This is now part of the Lough Mask regional scheme.				
WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	0	Ground Elevation (m OD):	---
Borehole Log Available:	---	Total Drilled Depth (m bgl):	n/a	Depth to Bedrock (m bgl):	---
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	---	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:	Estimated mean spring flow is approximately 3,000 m³/d.		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Ballindine	Number of Abstraction Points in the Scheme:	0	Source Report Available	N
Source Report Info:	---				
Scheme Summary:	Ballindine is a spring that was used for the town's water supply, but is now disused.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Deep well drained mineral (BminDW)					Subsoil Permeability:	Moderate
	Subsoil:	Tills (diamictos) (TLs)						
	Bedrock:	Dinantian Pure Bedded Limestones						
HYDROGEOLOGY	Aquifer Category:	Rkc	Vulnerability at Monitoring site:	High to Low		Flow Regime:	Karstified	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km ²):	8.92	ZOC Delineated By:	Tobin (CK)		Recharge Estimate (mm/yr):	300	
	ZOC Delineation Comments:	Recharge, spring flow rate, topography. Two spot measurements available. Groundwater flow directions assumed to be SE-NW and most easterly groundwater divide assumed to occur between Lisduff and Burris. Area delineated is conservative and suggests the most likely contributing area to the spring. Variance of electrical conductivity suggests a mixture of conduit and diffuse flow mechanisms.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	0	0	0	0	0	98.49	1.51	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 10 mg/l NO3 and the maximum nitrate concentration was 25 mg/l NO3. The average ammonium concentration was 0.032 mg/l N and the maximum ammonium concentration was 0.261 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.029 mg/l P and the maximum MRP concentration was 0.127 mg/l P. The average chloride concentration was 19.8 mg/l Cl and the maximum chloride concentration was 28.2 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	340	100-460						
Hardness (mg/l CaCO3):	Average:	Range:						
	365	126-466						
Conductivity (uS/cm):	Average:	Range:						
	695	477-802						
Monitoring Record Period:	From:	To:						
	1995	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:		Phosphate			
Risk Category:	At risk, high confidence		GWB Status:		Poor			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:		Low:	Negligible:		
	0.00	0.00	63.83		5.07	31.10		
OTHER INFORMATION								



Spring Source



Site



Weir

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).

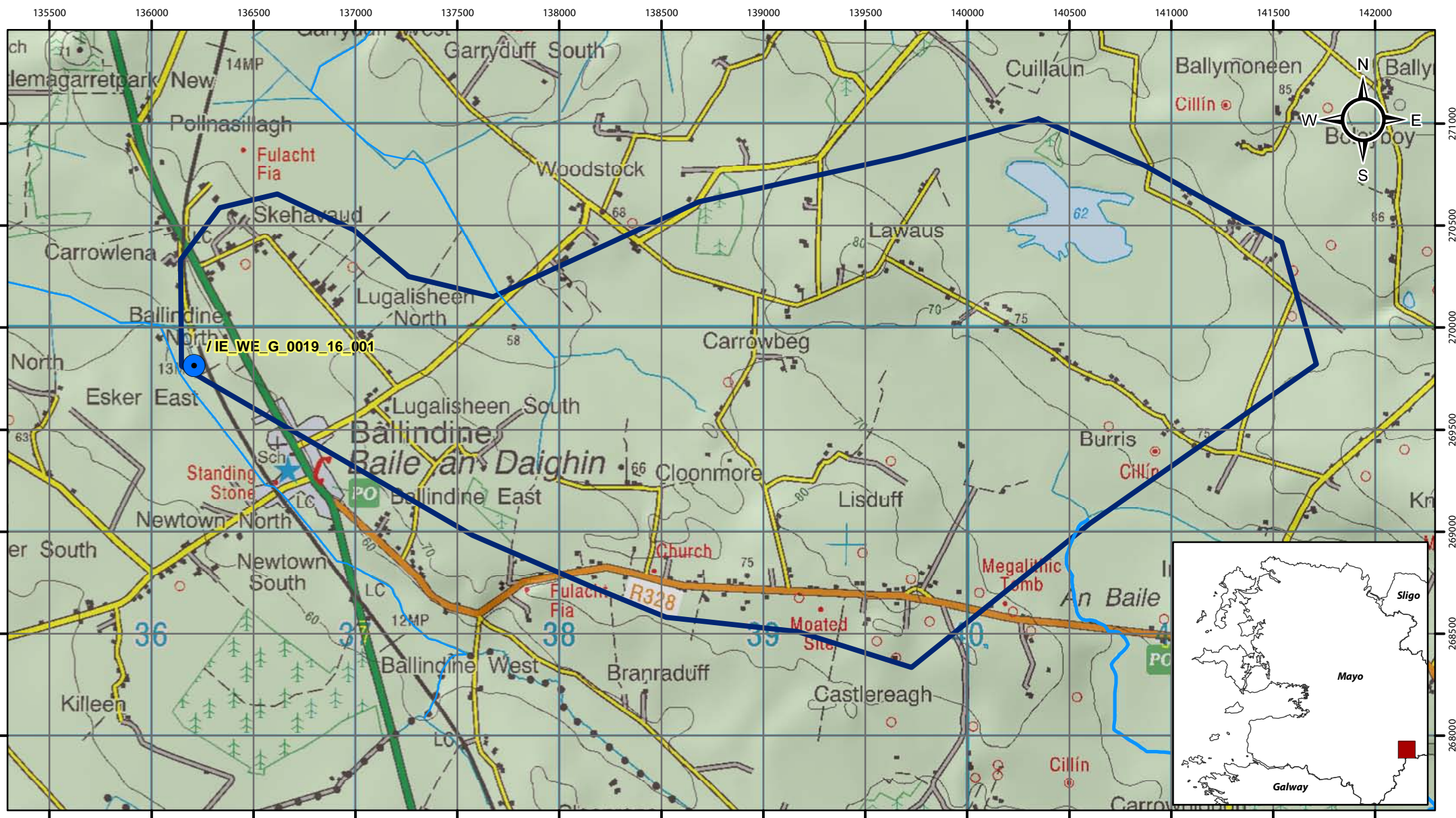
General Downgradient Distances

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.

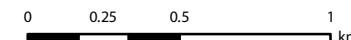
Version 0:	Prepared by		Date:	
Version 1:	Prepared by	Tobin (CK)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

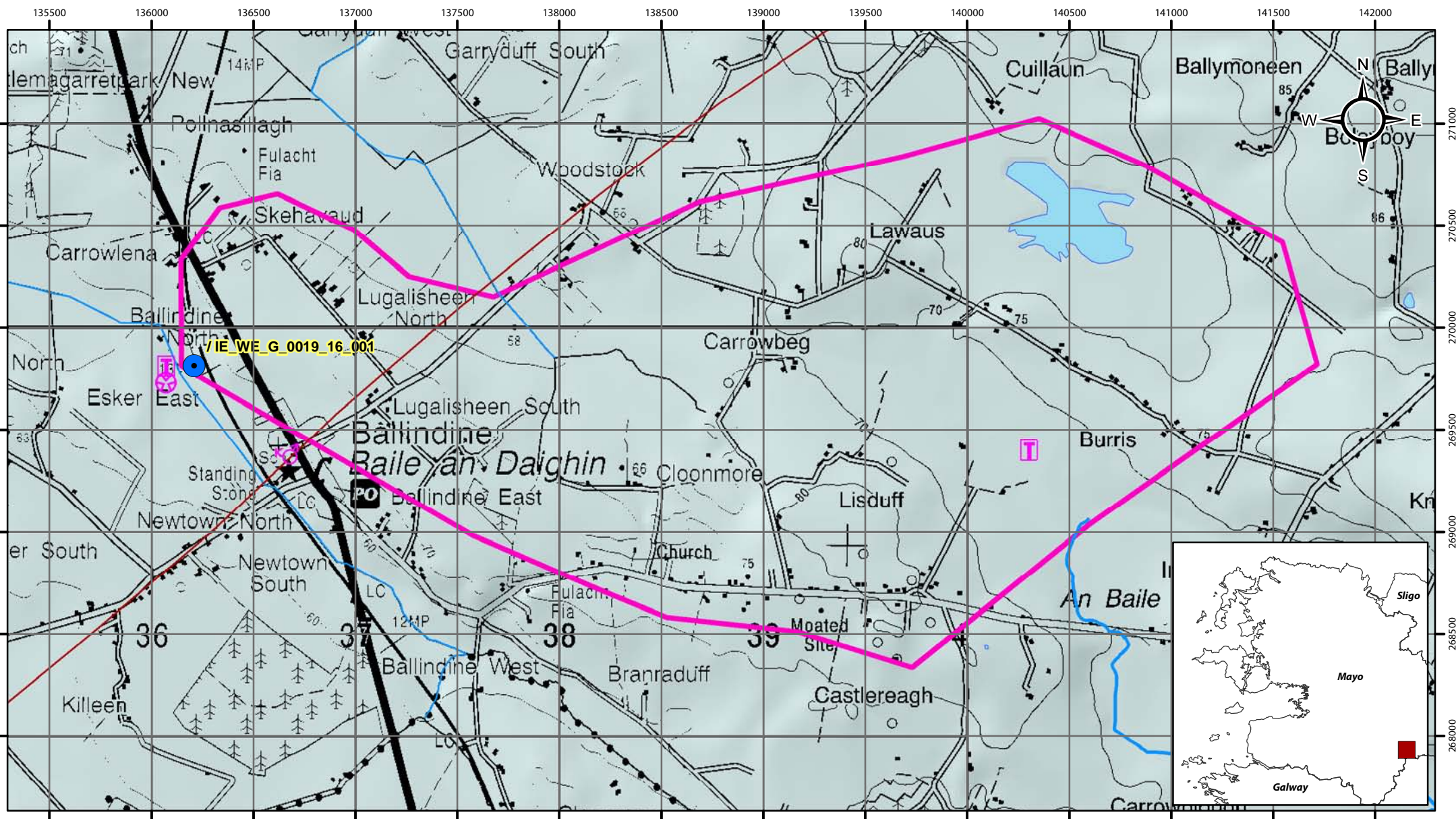


Location Map for Ballindine










- Abstractions
- River
- Zone of Contribution

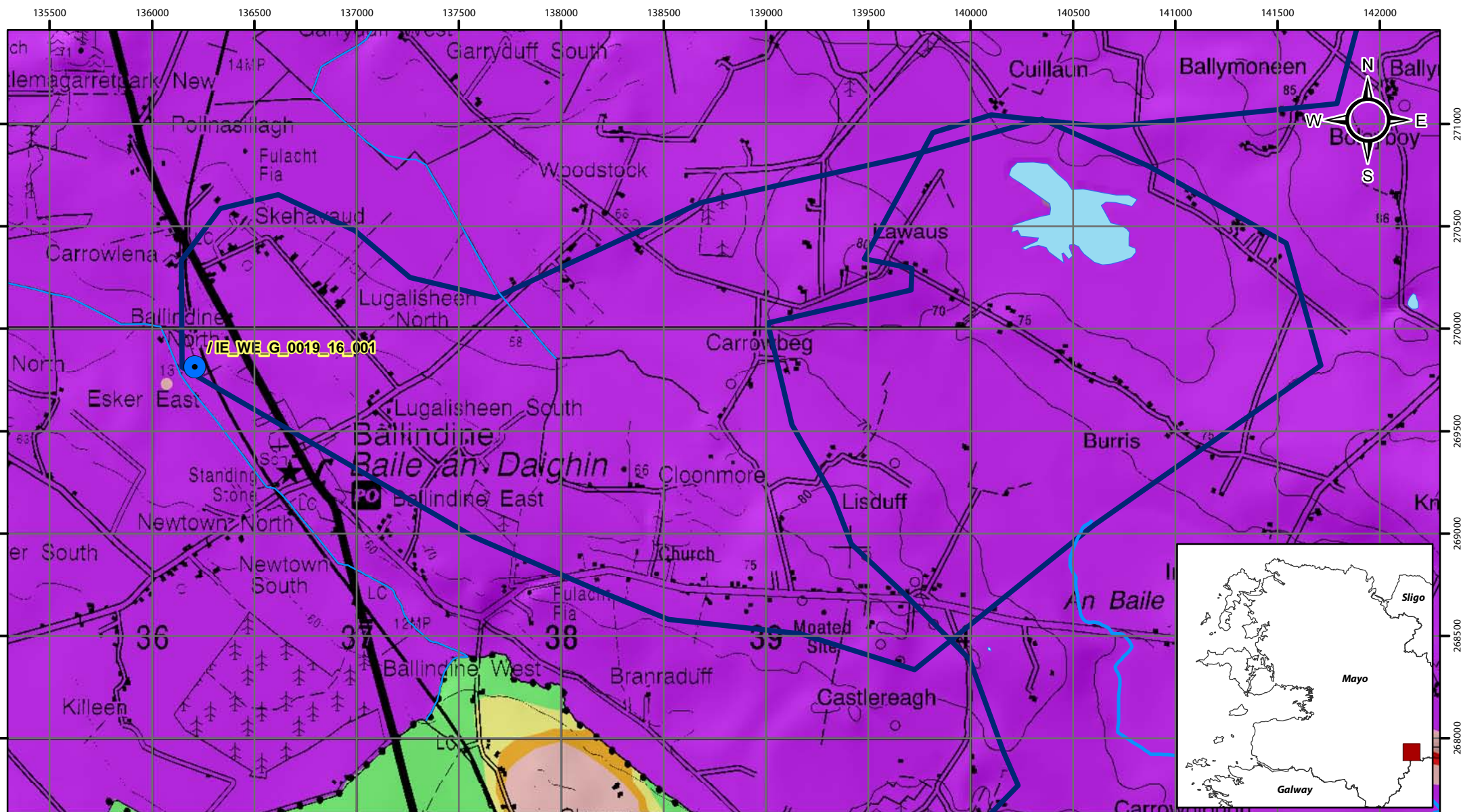
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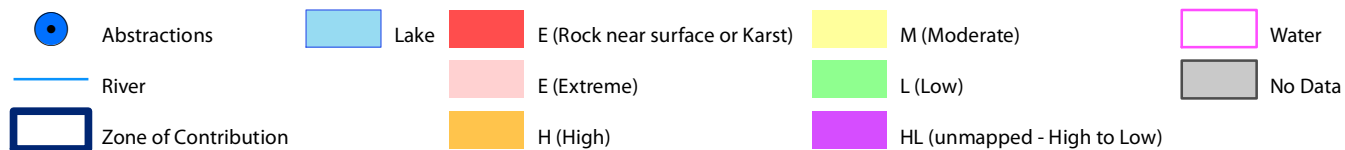


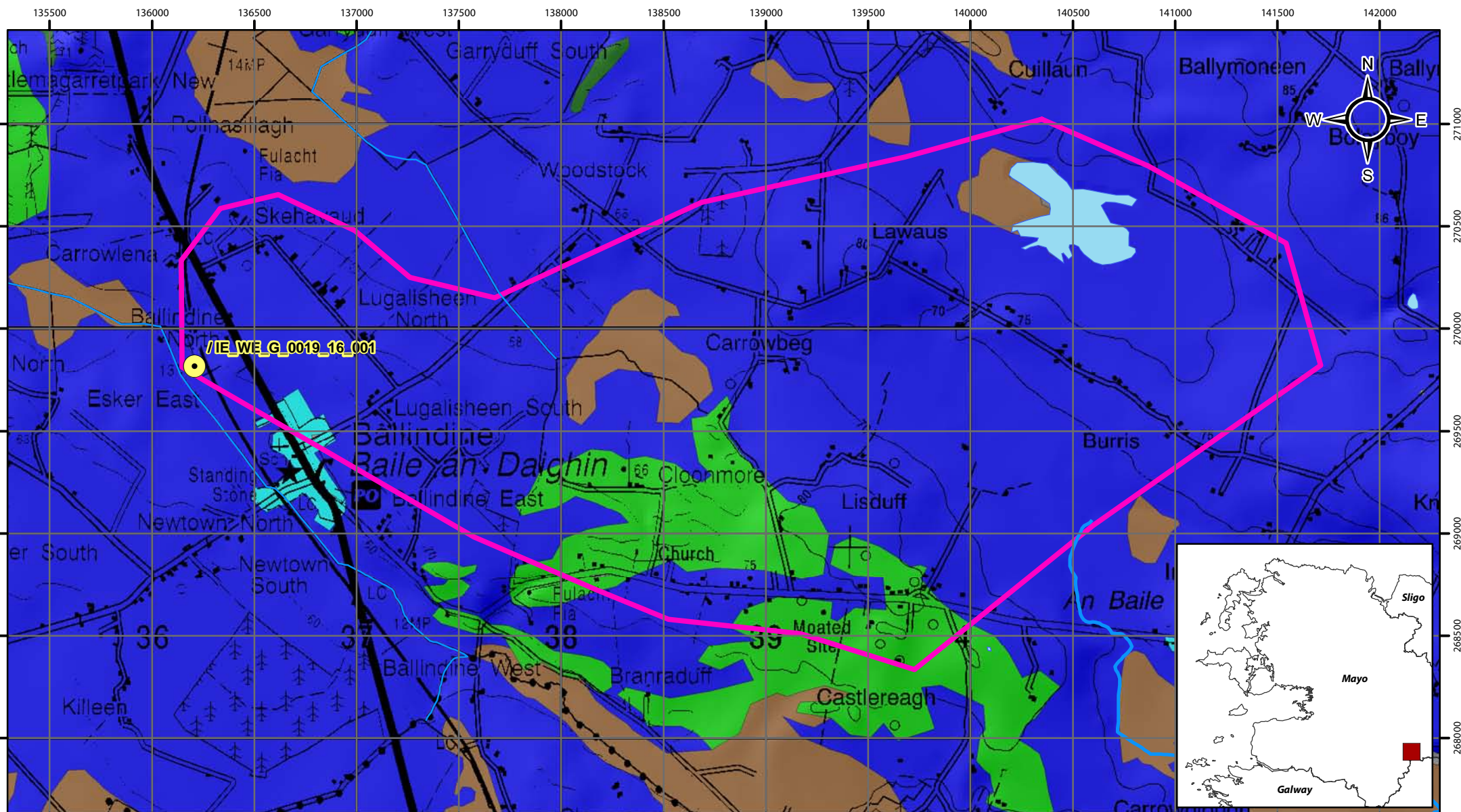
Bedrock Map for Ballindine

- | | | | | | |
|--|----------------------|---|----------------------------------|---|---------------------|
|  | Abstractions |  | Lake |  | Enclosed Depression |
|  | River |  | Dinantian Pure Bedded Limestones |  | Spring |
|  | Zone of Contribution |  | Fault |  | Turlough |














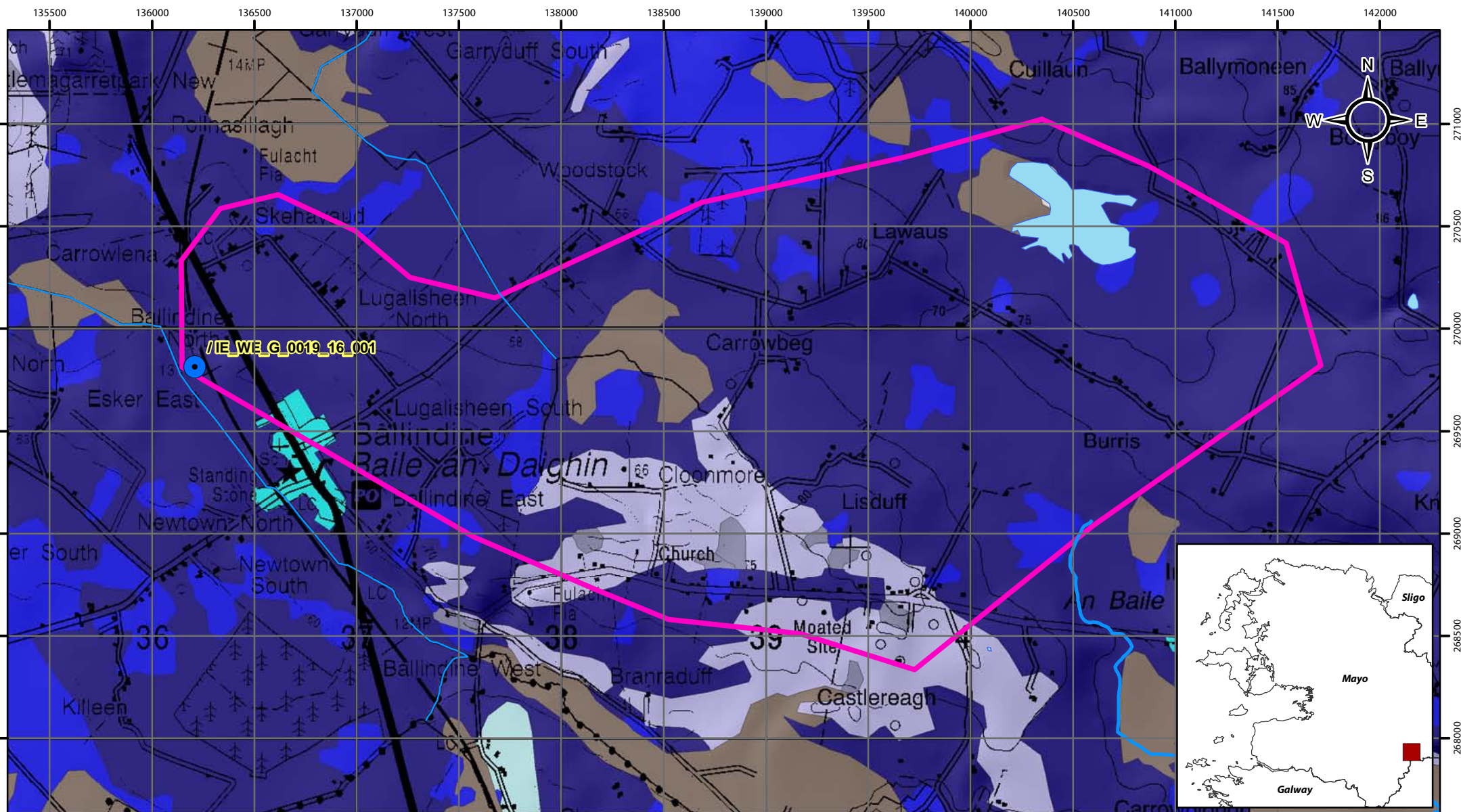
Groundwater Vulnerability Map for Ballindine





Subsoils Map for Ballindine

- | | | | | |
|---|--|---|---|---|
|  Abstractions |  Lake |  Cutover raised peat |  Karsified bedrock outcrop or subcrop |  Water |
|  River |  Esker comprised of gravels of basic reaction |  Made ground | | |
|  Zone of Contribution |  Gravels derived from limestones |  Till derived from limestones | | |



Soils Map for Ballindine

