

Water Framework Directive Groundwater Monitoring Programme

Site Information **Tooreen/Aghamore**



Tooreen Aghamore is a spring which is used as a group water supply. It has an average abstraction rate of 1000 m³/day, but the overall spring discharge is much greater, close to 10,000 m³/day (average).



Mayo

August 2011

SITE INFORMATION					
Site Name:	Tooreen/Aghamore		County:	Mayo	
RBD:	WRBD		EU Reporting Code:	IE_WE_G_0033_16_020	
Easting:	149428		GWB Name:	Swinford	
Northing:	284811		GWB Code:	IE_WE_G_0033	
Site Use:	Drinking Water (GWS)		Drinking Water Code:	2200PRI2111	
Hydrometric Area:	34		Water Level Monitoring Network:	Level	Flow
Townland:	CROSSBEG			N	Y
Ownership:	Tooreen Aghamore Group Water Scheme				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		Y
Site Comments:	The spring source is protected by a cover structure. The sample is taken directly from the spring source.				

SITE DIRECTIONS	
Location and Access Information:	Located 5km north of Ballyhaunis. Drive north on the N83 from Ballyhaunis. After c. 4 km from town centre, exit the N83 onto a road which leads vaguely left at Collnaha South. Follow this road for 1.5 km and turn right onto dirt lane which after a sharp right and left turn leads straight to source.
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	Spring	Abstraction Rate (m³/d):	~1000	Ground Elevation (m OD):	88
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:	The abstraction rate is uncertain in 2010, but in the order of 1000 m³/d. The distribution network has high losses due to leaks.		
Specific Capacity (m³/d/m):	---				
Static Water Level (m bgl):	---				
Scheme Name:	Tooreen/ Aghamore GWS	Number of Abstraction Points in the Scheme:	1	Source Report Available	N
Source Report Info:	---				
Scheme Summary:	Tooreen/ Aghamore is a GWS that serves about 500 houses. The source is a single spring.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Cutaway/cutover peat (Cut)					Subsoil Permeability:	Low
	Subsoil:	Peat (Cut)						
	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):	15.16	ZOC Delineated By:	Tobin (CK)		Recharge Estimate (mm/yr):	577	
	ZOC Delineation Comments:	The spring occurs at a break in slope coincident with a till/peat boundary. Groundwater flow directions assumed to be mainly from the NW. The area northwest of the spring is devoid of drainage relative to the areas in the greater region, due to a high proportion of gravels exposed at the surface and areas of shallow rock. It is assumed that the ZOC occurs mainly in this area, and the boundaries are based on topography. The ZOC is based on a total discharge of approximately 10,000m ³ /day.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	1.48	1.47	0	0	0	97.05	0	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO ₃		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was 11 mg/l NO ₃ and the maximum nitrate concentration was 16 mg/l NO ₃ . The average ammonium concentration was 0.036 mg/l N and the maximum ammonium concentration was 0.31 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.008 mg/l P and the maximum MRP concentration was 0.02 mg/l P. The average chloride concentration was 13.7 mg/l Cl and the maximum chloride concentration was 18 mg/l Cl.				
Alkalinity (mg/l HCO ₃):	Average:	Range:						
	359	330-390						
Hardness (mg/l CaCO ₃):	Average:	Range:						
	389	335-446						
Conductivity (uS/cm):	Average:	Range:						
	668	477-763						
Monitoring Record Period:	From:	To:						
	2007	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	2.62	86.30		0.24	10.84		
OTHER INFORMATION								



Site



Spring



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 NO₃)

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

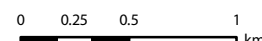
It is assumed that groundwater downgradient of a spring cannot flow back up to the spring, however a precautionary 30m buffer is generally applied which allows for instances where pumping under dry weather periods may induce a drawdown or where the ground may be sloping toward the spring from the downgradient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

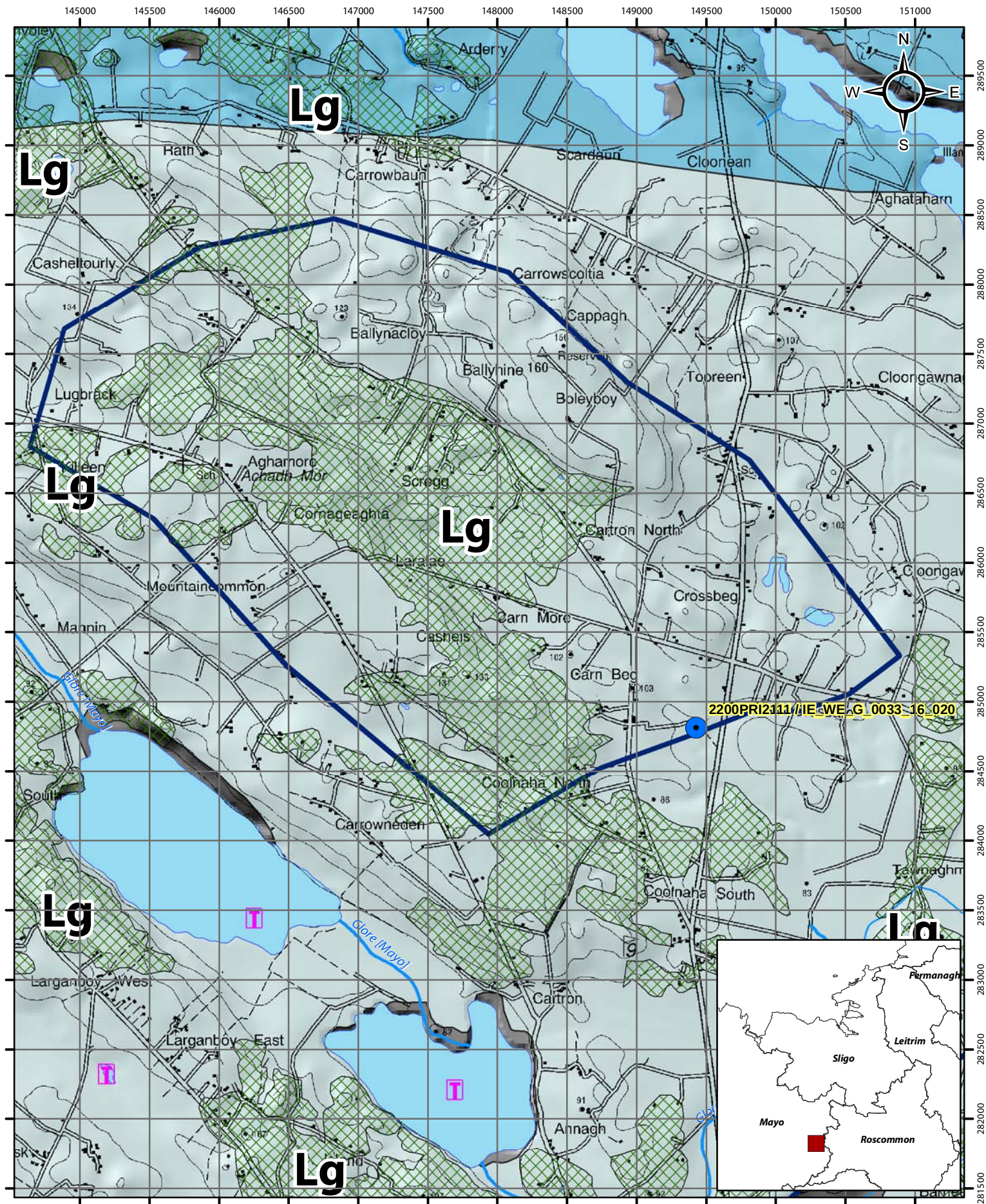
Version 0:	Prepared by		Date:	
Version 1:	Prepared by	Tobin (CK)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	

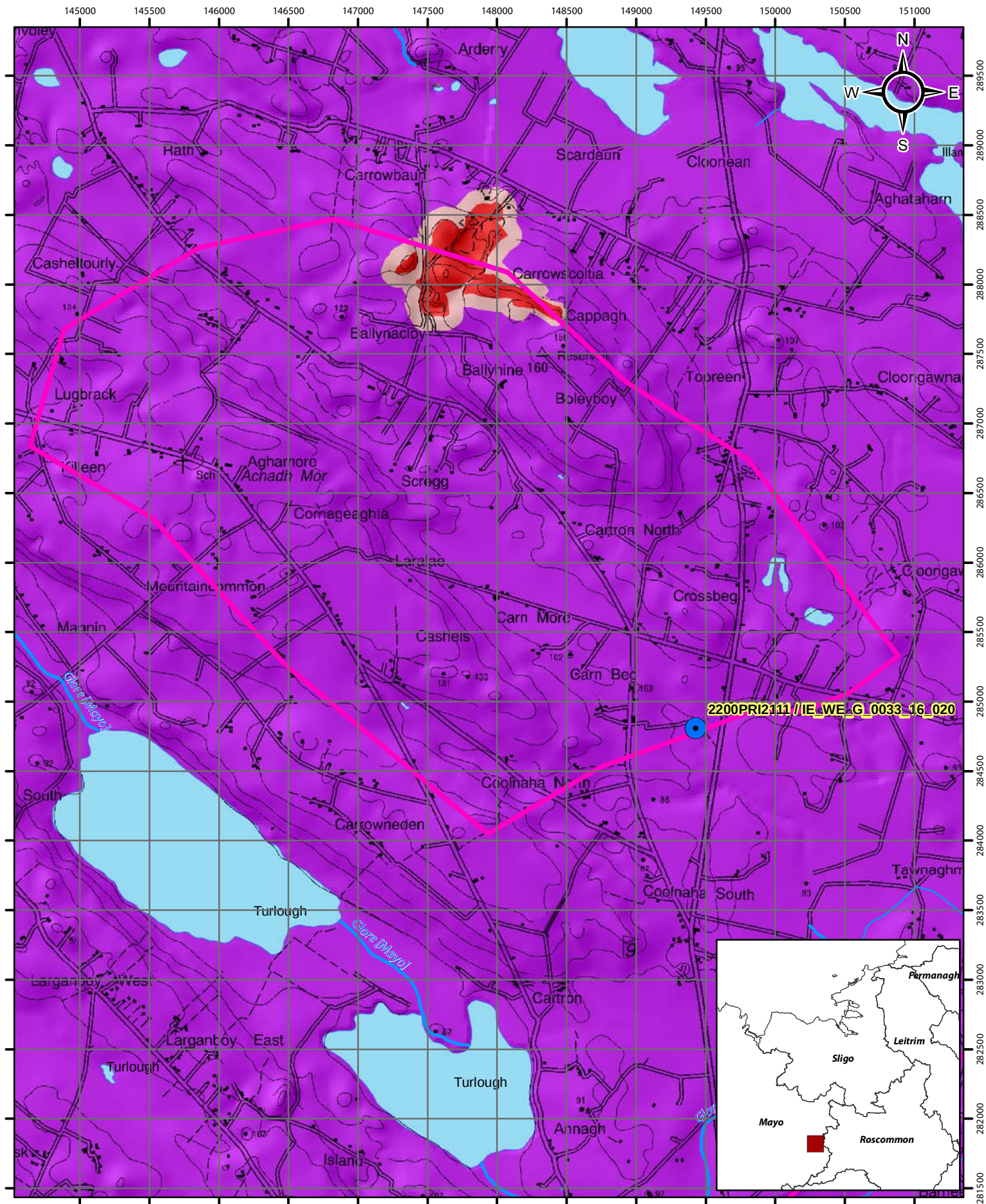
Location Map for Tooreen/Aghamore

-  Abstractions
 Zone of Contribution
 River

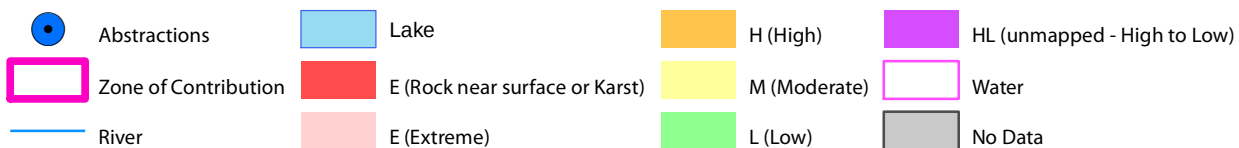
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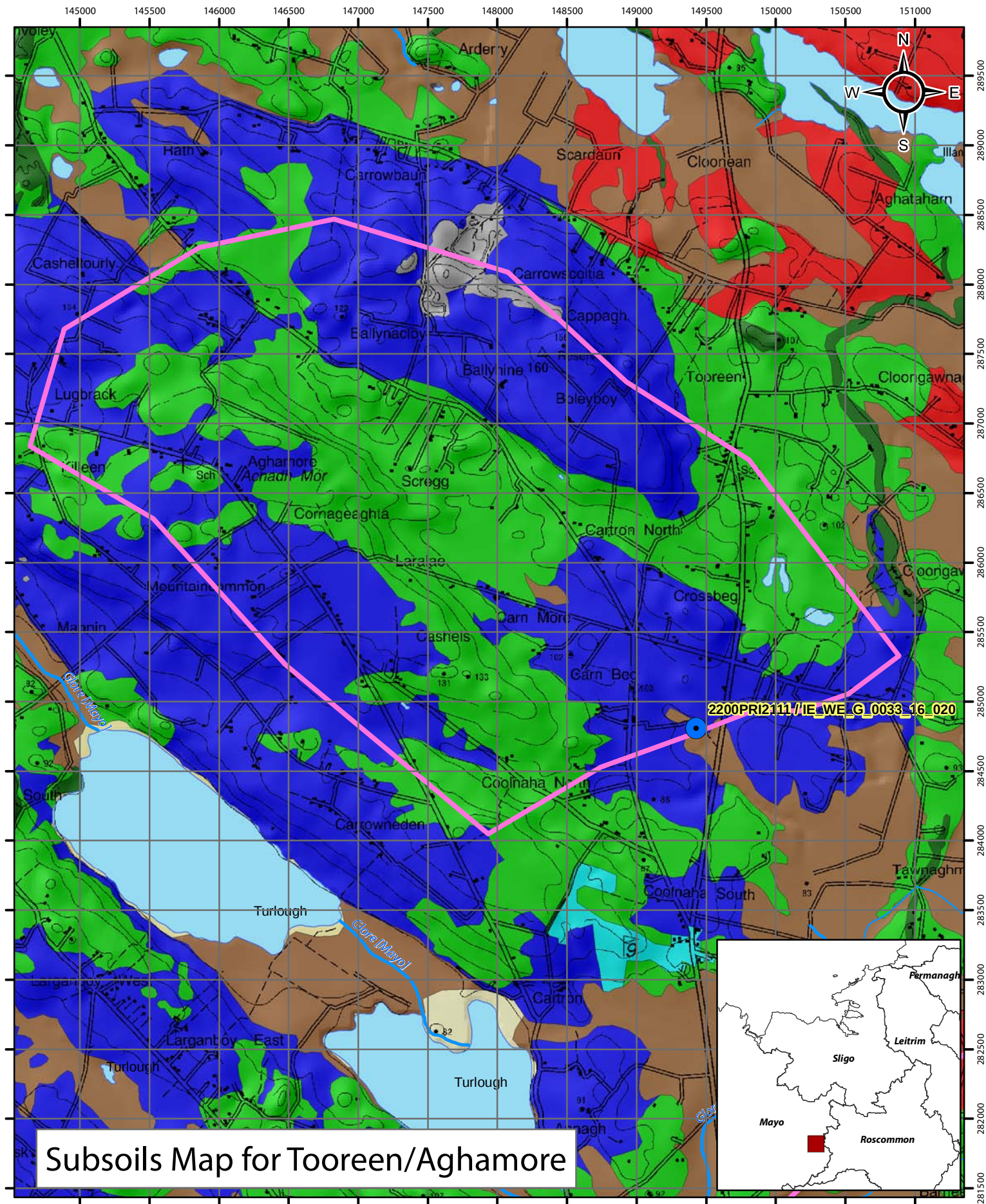


Groundwater Vulnerability Map for Tooreen/Aghamore



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0 0.25 0.5 1
km



- | | | | |
|----------------------|-------------|---------------------------------|--|
| Abstractions | Water | Cutover raised peat | Karstified bedrock outcrop or subcrop |
| Zone of Contribution | Fen peat | Lacustrine sediments | Till derived from Devonian sandstones |
| River | Lake marl | Till derived from limestones | Esker comprised of gravels of basic reaction |
| Lake | Made ground | Gravels derived from limestones | |

