

## Water Framework Directive Groundwater Monitoring Programme

### Site Information

### Dunshaughlin Bore (College Park)



Dunshaughlin Bore (College Park) is one of six abstraction wells that service the Dunshaughlin public water supply. The scheme has a total abstraction rate of 3,635 m<sup>3</sup>/day, with the College Park borehole (PW7) having an abstraction rate of up to 900 m<sup>3</sup>/day.

SITE INFORMATION					
Site Name:	Dunshaughlin Bore (College Park)		County:	Meath	
RBD:	ERBD		EU Reporting Code:	IE_EA_G_002_17_002	
Easting:	296604		GWB Name:	Trim	
Northing:	252256		GWB Code:	IE_EA_G_002	
Site Use:	Drinking Water (PWS)		Drinking Water Code:	2300PUB1007	
Hydrometric Area:	7		Water Level Monitoring Network:	Level	Flow
Townland:	Knocks			N	N
Ownership:	Meath Co Co				
Water Quality Monitoring Network:	Surveillance		Operational (Point)		Operational (Diffuse)
	Y		N		N
Site Comments:	The topography is relatively flat and undulating. Agriculture is the principle activity outside of the village area with most of the land used for new housing developments and green belt areas.				

SITE DIRECTIONS	
Location and Access Information:	From Navan take the N2 towards Dublin. In Dunshaughlin town go straight at the lights (through crossroads with R125) and after 0.5 km turn right behind a school. Drive for about 300 meters until you see a small park on the right-hand side. The first well is located on the left-hand side in front of the entrance to the park. The second is inside the park along the fence on right-hand side after about 150 meters.
Additional Comments:	---

WELL INFORMATION					
Monitoring Point Type:	BH	Abstraction Rate (m³/d):	900	Ground Elevation (m OD):	96.9
Borehole Log Available:	Y	Total Drilled Depth (m bgl):	101.8	Depth to Bedrock (m bgl):	6
Top of Casing (m agl):	---	Upper Casing Diameter (mm):	457	Lower Casing Diameter (mm):	305
Final Borehole Depth (m):	---	Upper Casing Bottom Depth (m bgl) :	21	Lower Casing Bottom Depth (m bgl):	---
Screen Interval (m bgl):	21-77.4	Screen Type (PVC,Steel,other):	PVC and Johnson SS	Screen Slot Size (mm):	3
Grout Type (cement,bentonite):	Cement	Grouted above (m bgl):	21	Grout Volume Injected (m³):	---
Gravel Pack Interval (m bgl):	10 to 100	Gravel Pack Volume (m³):	---	Open Hole Interval (m bgl):	---
Potential Yield (m³/day):	1200	Comments on Monitoring Site:	PW1 to PW6 were drilled in 2004. The well details here are given for PW7 at College Park. PW7 was drilled in 2006 by Dunnes Well Drilling (WYG, Simon Scholl was reporting hydrogeologist) to replace the old production well (PW1) which had become blocked. 0.1 m cap below screen. TD=77.4 m bgl. Borehole collapsed at 77.4 m bgl. Water strike at 89.9 mbgl. Old well, PW1 had estimated specific capacity of 24 m³/d/m, and transmissivity in range of 50-60 m²/d.		
Specific Capacity (m³/d/m):	69.6				
Static Water Level (m bgl):	1.23				
Scheme Name:	Dunshaughlin WSS	Number of Abstraction Points in the Scheme:	7	Source Report Available	Y
Source Report Info:	The GSI completed a Groundwater Source Protection Report in 2004. However, the scheme has changed significantly since this was published.				
Scheme Summary:	Dunshaughlin WSS has 7 production boreholes that I produce up to 3,635 m³/day. The boreholes are numbered PW1 to PW7 and are located throughout Dunshaughlin, mainly N-NW.				

HYDROGEOLOGY								
GEOLOGY	Soil:	Made/Built land (Made)					Subsoil Permeability:	Low
	Subsoil:	n.a. (Made)						
	Bedrock:	Dinantian Upper Impure Limestones						
HYDROGEOLOGY	Aquifer Category:	Lm	Vulnerability at Monitoring site:	Low		Flow Regime:	Productive fissured bedrock	
ZONE OF CONTRIBUTION	Estimated ZOC Size (km²):	3.3	ZOC Delineated By:	CDM (HM)		Recharge Estimate (mm/yr):	150	
	ZOC Delineation Comments:	ZOC delineated for PW7, using abstraction rate of 900 m³/d plus 50% (safety margin/buffer). Vulnerability in area is low. Recharge correspondingly low (<100 mm) except area to S where vulnerability is extreme and recharge is higher (>200 mm between Dunshaughlin and Rath Hill). Bulk recharge is approx. 150 mm/yr . ZOC extends north to include GSI-mapped fault near Cookstown (presumed zone of greater fracture permeability). No surface water influence is expected due to low vulnerability (till = 6 m thick and cased off). ZOC shown represents PW7 only. Other wells in the PWS also pump, and could influence actual shape of ZOC to PW7, however, most are further N and NW, and on the N side of referenced fault, and inferred to induce flow from the N.						
Groundwater Vulnerability within ZOC (% area):	Extreme (X)	Extreme (E)	High	Moderate	Low	High to Low	Unclassified	
	0.63	5.7	10.47	22.98	55.87	0	4.98	
HYDROCHEMISTRY								
Hydrochemical Signature:	Ca-HCO3		Additional Water Chemistry Information:	During the monitoring period: The average nitrate concentration was <1 mg/l NO3 and the maximum nitrate concentration was 2 mg/l NO3. The average ammonium concentration was 0.085 mg/l N and the maximum ammonium concentration was 0.343 mg/l N. The average molybdate reductive phosphorus (MRP) concentration was 0.009 mg/l P and the maximum MRP concentration was 0.033 mg/l P. The average chloride concentration was 20.4 mg/l Cl and the maximum chloride concentration was 27.1 mg/l Cl.				
Alkalinity (mg/l HCO3):	Average:	Range:						
	322	230-390						
Hardness (mg/l CaCO3):	Average:	Range:						
	397	281-465						
Conductivity (uS/cm):	Average:	Range:						
	744	506-855						
Monitoring Record Period:	From:	To:						
	2007	2010						
RISK ASSESSMENT								
Pressure (e.g., Nitrates, Phosphates, Abstractions):	Diffuse		Typical Contaminants:		Nitrate			
Risk Category:	At risk, high confidence		GWB Status:		Good			
Impact Potential within ZOC (% area):	Extreme:	High:	Moderate:		Low:	Negligible:		
	0.00	7.48	3.78		50.79	37.95		
OTHER INFORMATION								
PW6 is used to monitor water levels by the EPA (not pumped). Yields and/or abstraction rates from 7 wells range from 200-1,500 m³/d. Scheme being upgraded: Laying of collector mains to connect seven production wells to a new treatment facility; construction of a new water treatment plant with a capacity to produce 3,635m³/d of potable treated water, facility to expand to 7,000m³/d in the future. New pumping station and clearwater balancing tank to transfer water to an elevated water tower. Construction of a 3,000m³ capacity, 42m high (from existing ground level) elevated water tower with a top water level of 139m AOD. Provision of a SCADA/telemetry system to efficiently manage the scheme.								





Site Location



Well Cover



Sampling Point

## 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

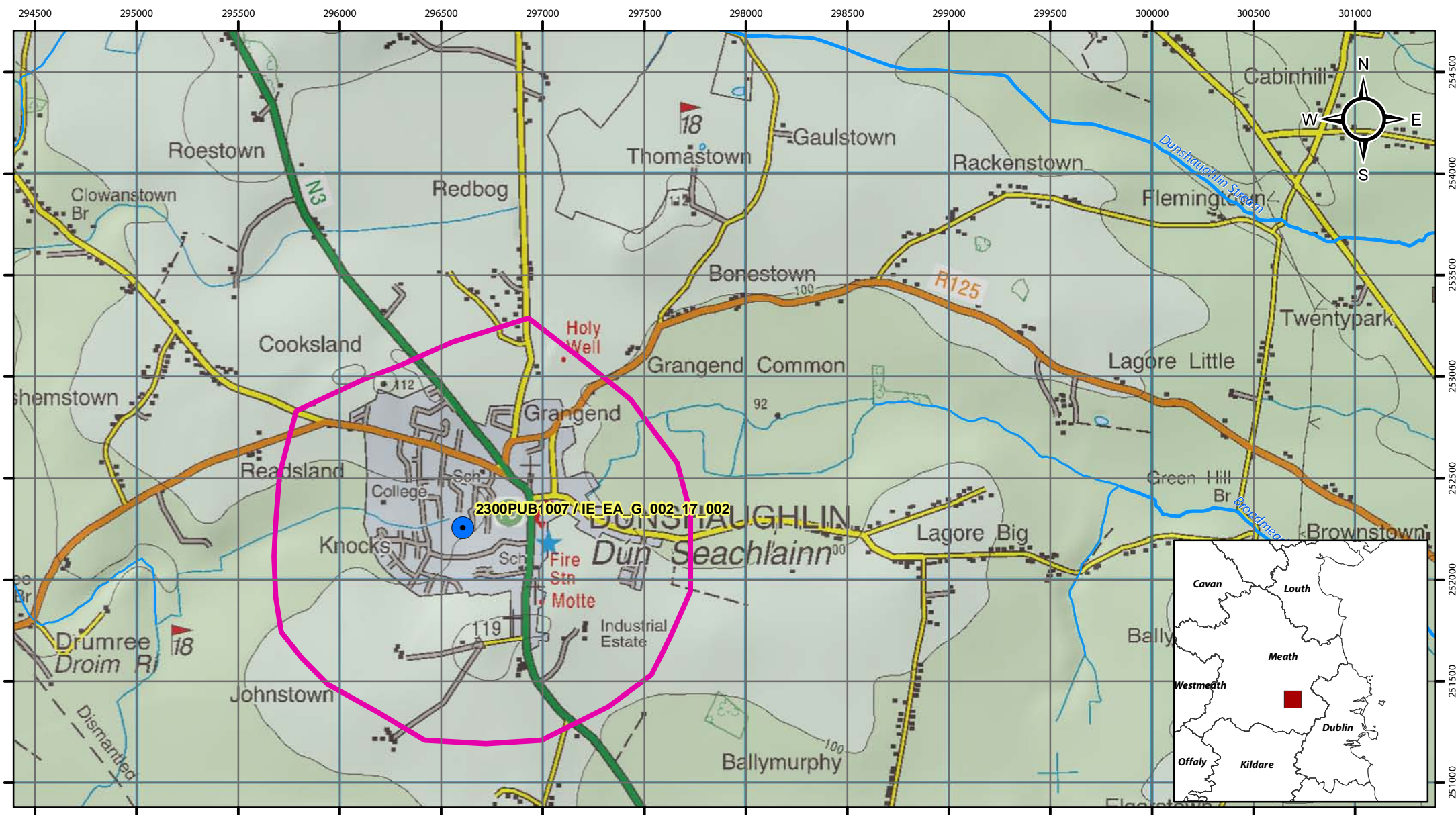
General Downgradient Distances (XL) applied to boreholes sourced in bedrock aquifers are constrained to estimate approximate limits based on data at the GSI. In some cases they may be higher or lower depending on local conditions.

Rk, Rkd, Lk	225 m
Lm	150 m
LI, PI	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:	15/06/2004
Version 1:	Prepared by	CDM (HM)	Date:	Feb 2011
Version 2:	Prepared by		Date:	
Version 3:	Prepared by		Date:	
Version 4:	Prepared by		Date:	



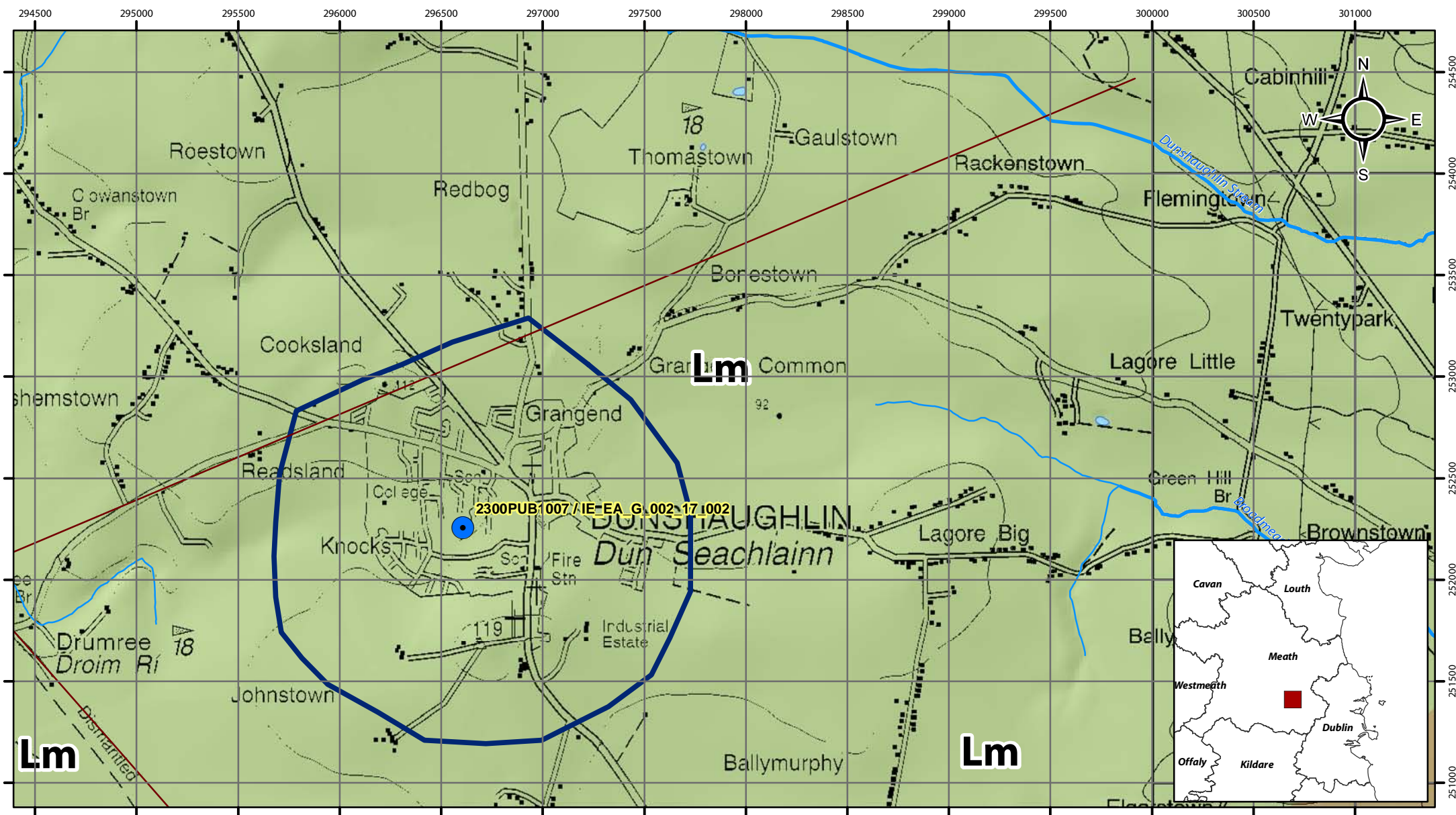


## Location Map for Dunshaughlin Bore/College Park

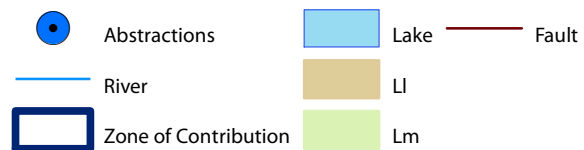
- Abstractions
- River
- Zone of Contribution

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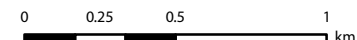
0 0.25 0.5 1  
km



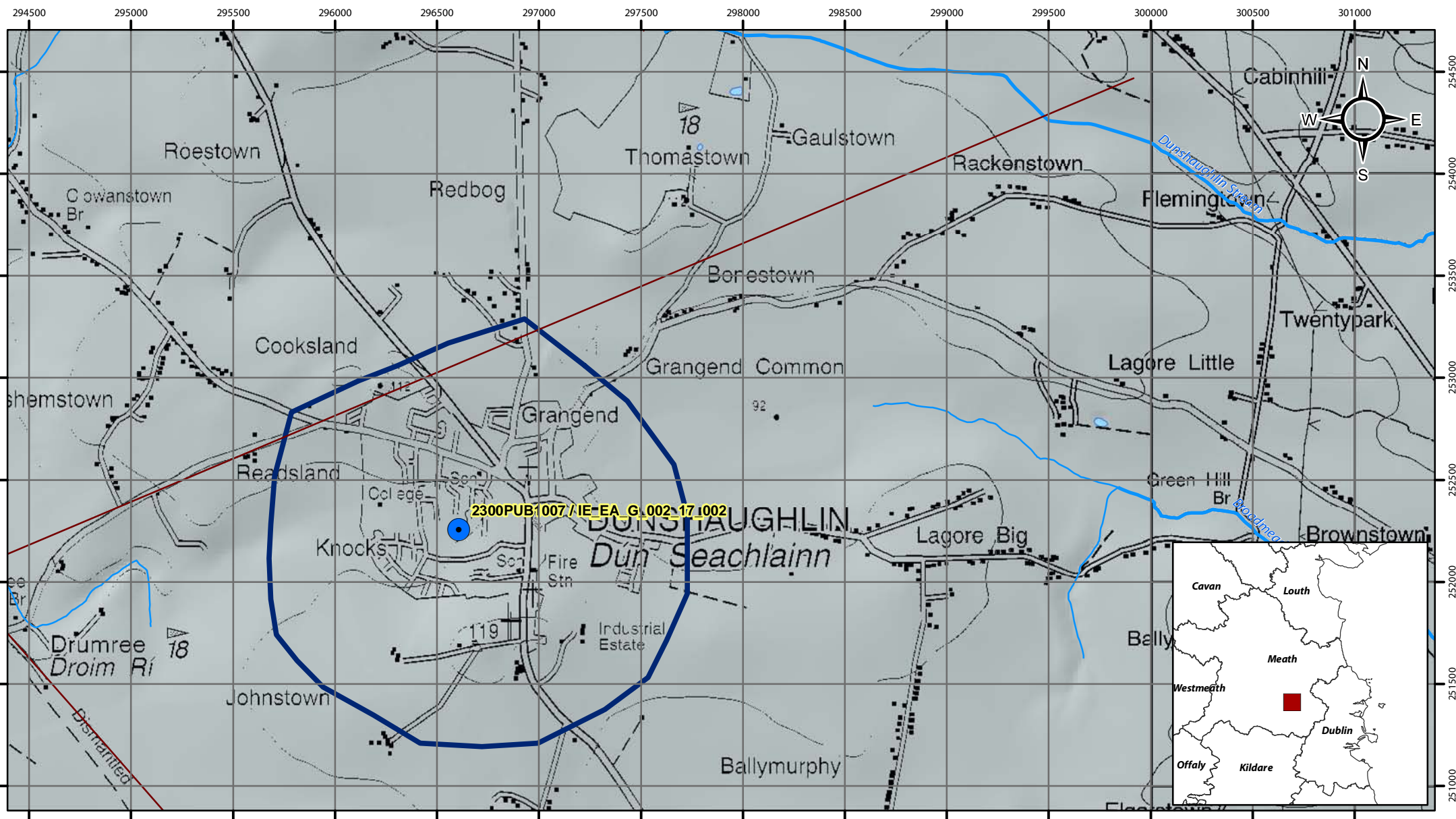
## Aquifer Category Map for Dunshaughlin Bore/College Park



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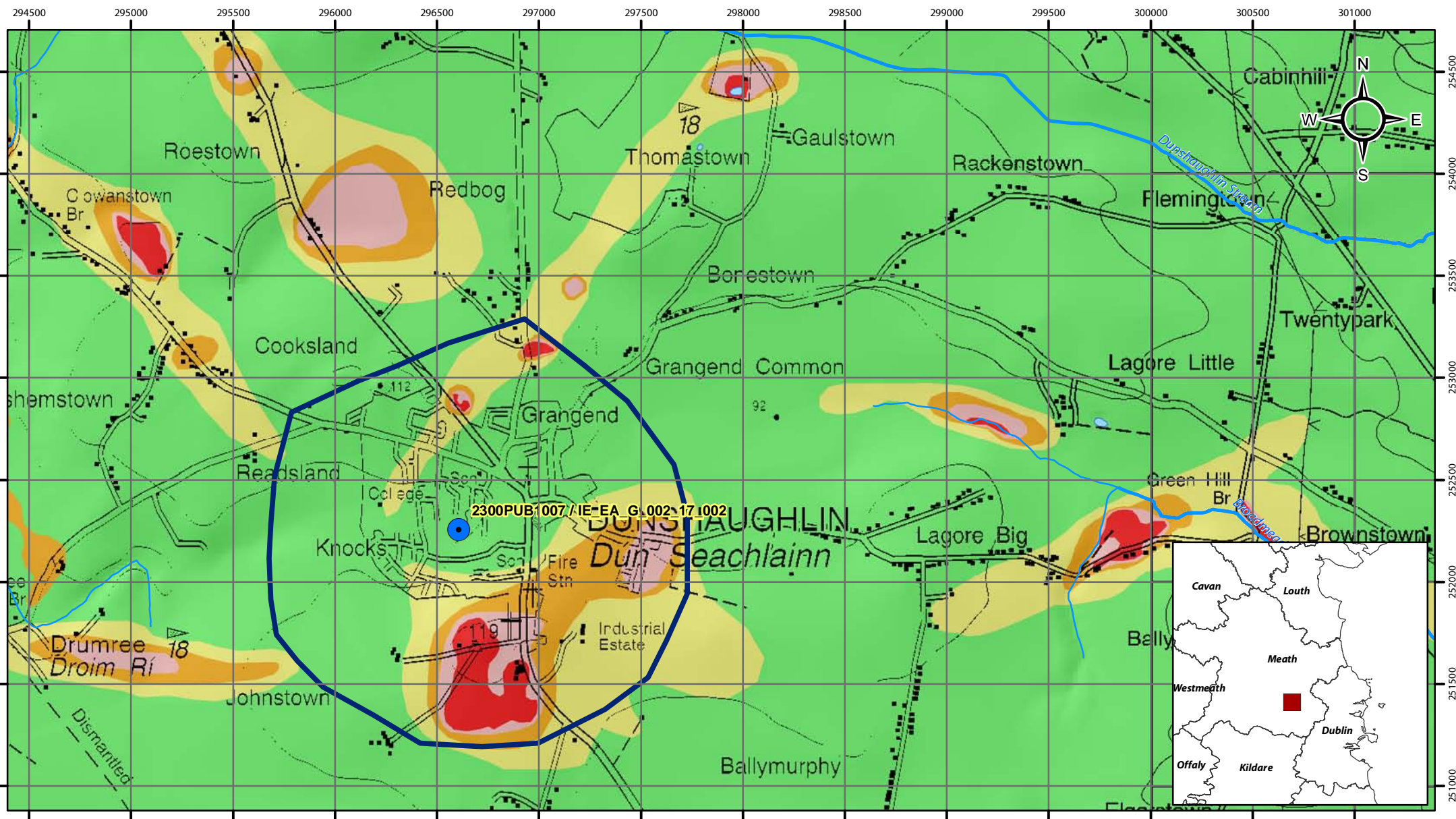
## Bedrock Map for Dunshaughlin Bore/College Park

- Abstractions
- Lake
- Fault
- River
- Dinantian Upper Impure Limestones
- Zone of Contribution

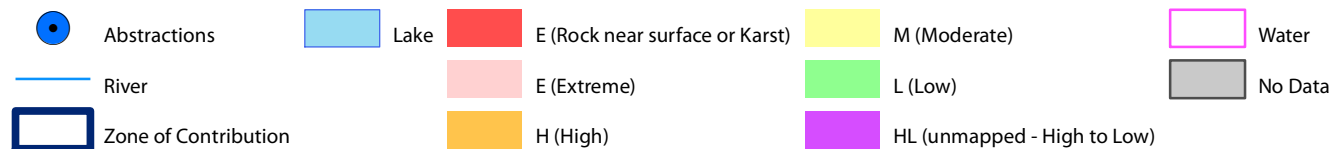
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0 0.25 0.5 1  
km

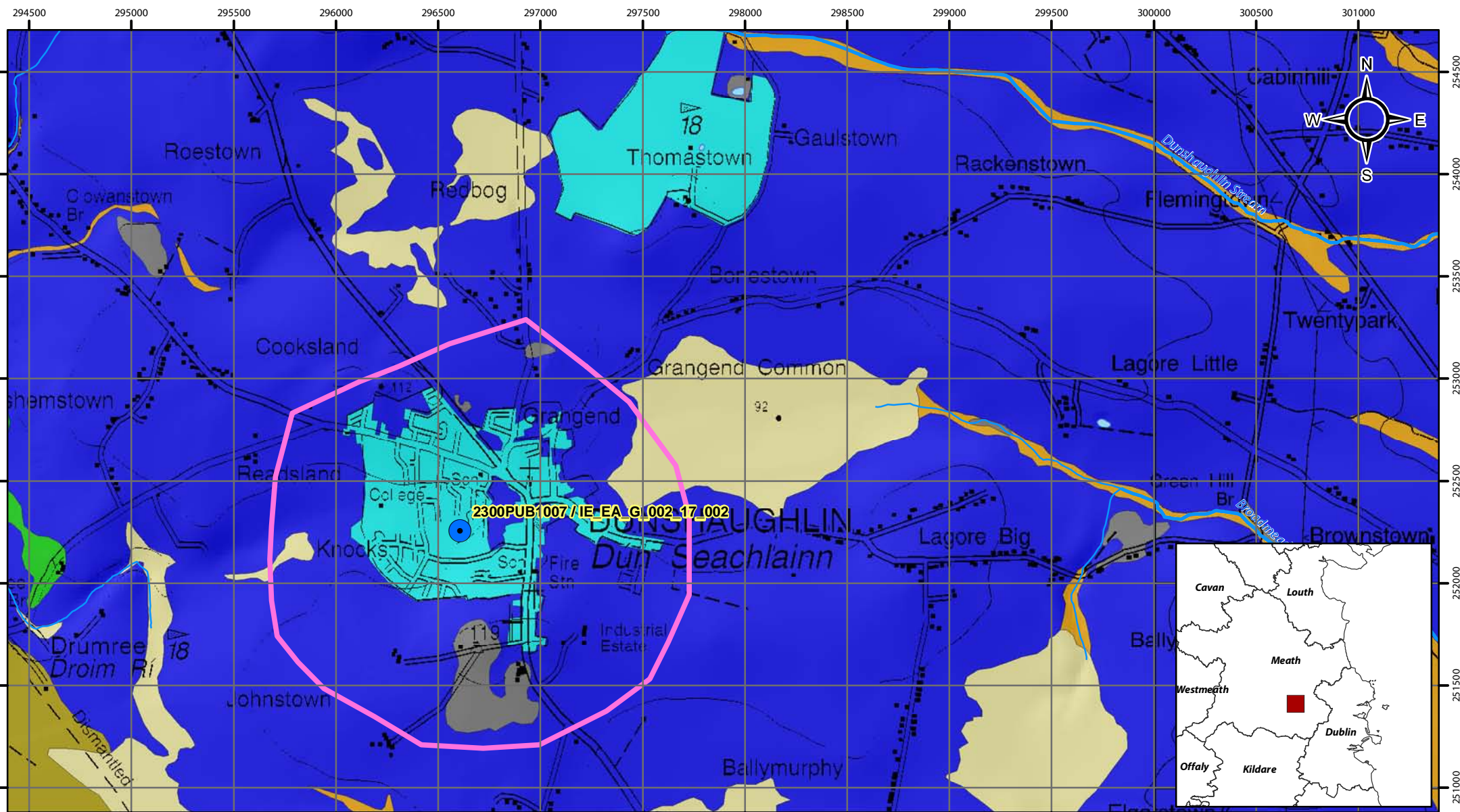




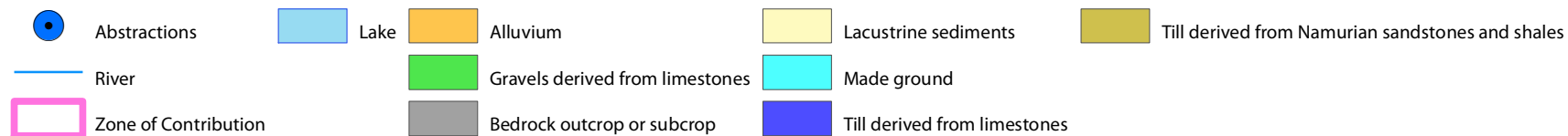
## Groundwater Vulnerability Map for Dunshaughlin Bore/College Park



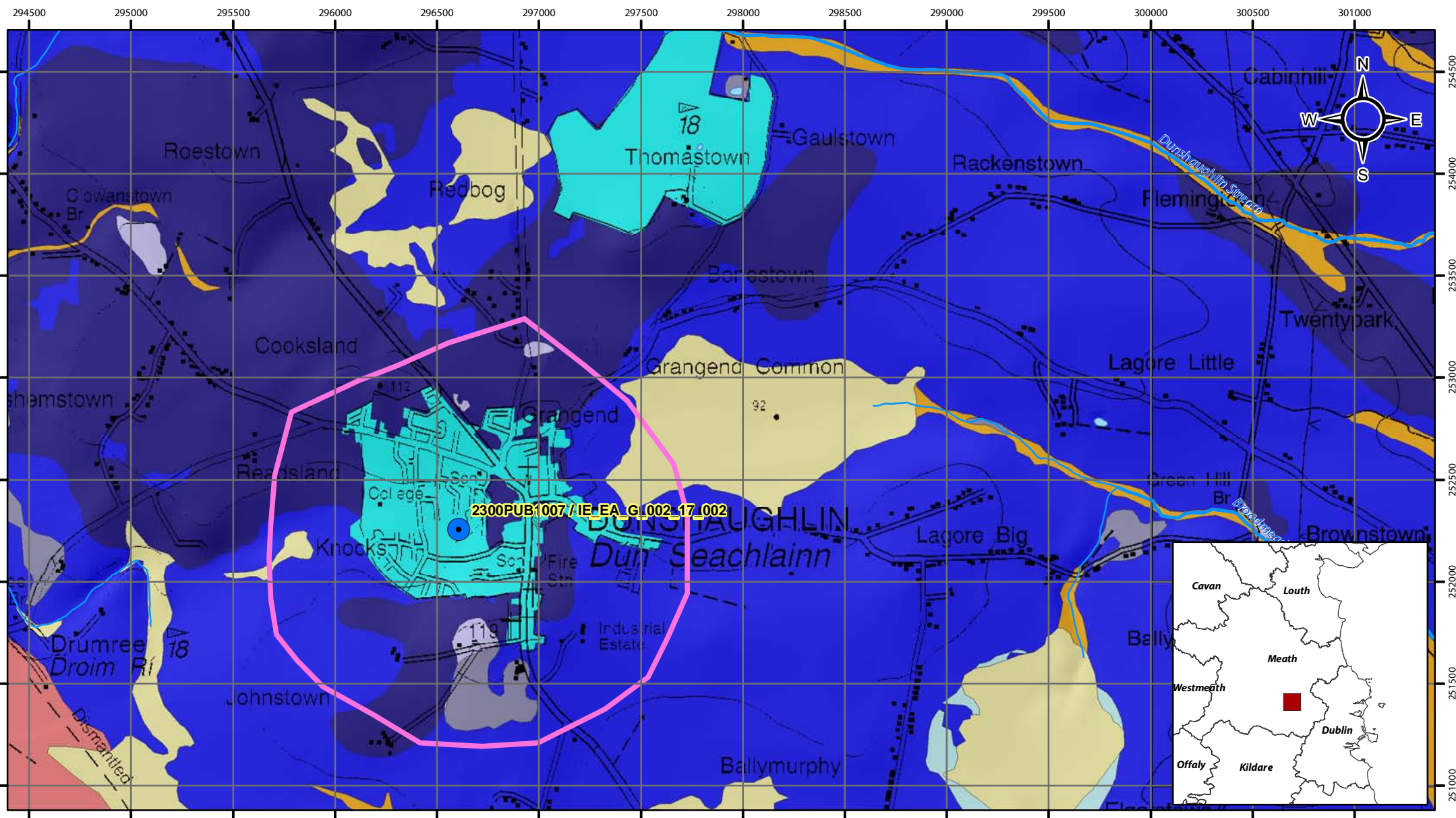




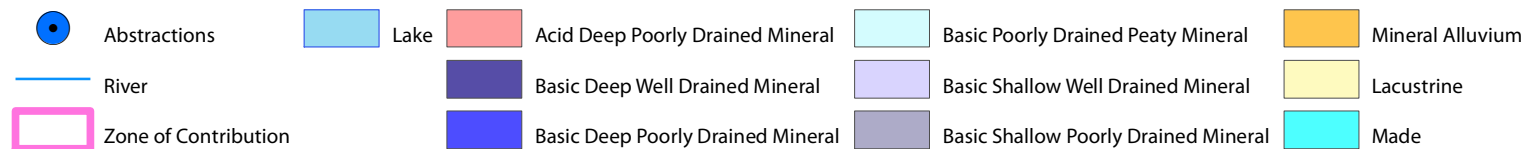
## Subsoils Map for Dunshaughlin Bore/College Park







## Soils Map for Dunshaughlin Bore/College Park



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0 0.25 0.5 1 km