



An
Bord
Pleanála

**Technical
ABP-317106-23**

To: Cait Ryan.

From: Emmet Smyth.

**Re: Residential development comprising of 97 No. residential units and
creche at Baunacloka, Raheen, Co. Limerick.**

Date: 4th July 2025.

Background:

The proposed development comprises the construction of 97 No. residential units and a creche, pumping station with a pumped rising main connection to existing infrastructure at the Raheen roundabout with the construction of all associated roads pavements, car parking street lighting, foul and surface water drainage and all ancillary site development works on lands at Baunacloka, Raheen, Co. Limerick.

The Board issued a Section 132 notice on 8th November 2024, requesting information pertaining to 2 items. Consequently the following advice is requested from the Environment Team and is summarised as follows. My responses in Bold Italics.

Questions 1(a) The findings of the soakaway investigation report include details of 2 trial hole tests and the resulting soil infiltration rates. Are the trial hole test results acceptable, and if so, which of the 2no. stated soil infiltration rates would Environment recommend be chosen for design and calculation purposes?

Yes the infiltration rates returned are acceptable and have been carried out in accordance with the requirements of the BRE 365 Digest methodology.

The 2 results soil infiltration characteristics would be indicative of a well-drained material with good permeability characteristics typically being in the range of 1×10^{-6} to 1×10^{-3} . The lowest percolation rate acceptable for soakaway efficiency is 1×10^{-6} m/s, the returned results are well above this level. No water table or mottling was observed within the trial hole. The trial hole is required to discharge full to half volume within 24 hours and both tests have met this requirement. The rationale for the use of the slower returned infiltration rate is primarily down to the different behaviour of the waters used for the testing and how storm waters interact with the in-situ soil material. Generally speaking rainwater run-off infiltrates quicker than water used during the testing.

(b) Is the information submitted in response to Item 1(a) of the section 132 notice adequate to ascertain whether the proposed SUDS measures and specifically the soakaway can adequately manage surface water generated by the proposed development entirely within the site?

Yes I am satisfied that the information submitted in response to item 1(a) of the Section 132 notice is adequate to demonstrate the soil material at the site can adequately deal with the generated surface waters from the proposed development.

(2) The cover letter from EOB Management Services (engineering consultants) states the independent soakaway investigation has established a value for the site at 237mm/hr, and that in the Flow calculations a conservative 100mm/hr is used to account for any variations across the site giving a safety factor of 2.37.

Is the value of 237mm/hr stated to be established in the Soakaway Investigation (a) correctly applied and (b) acceptable?

The use of 237mm/hr correlates to the slower of the soil infiltration value in the BRE 365 test. Taking into account the potential for soil infiltration variations the more conservative figure of 100mm/hr is being utilised. It would be deemed acceptable to given that the site is located within an area of well drained limestone tills but with a more poorer drained component to the west of the site.

(3) Is the information submitted in response to Item 1(a) and (b) (namely the Hydrogeological Site Investigation) adequate to ascertain if there would be any hydrological, hydrogeological or other impacts (either by way of surface water or groundwater) from the proposed development on pNHA Loughmore Commons Turlough (Site Code 000438)?

Geologically speaking the site may be described as follows; high vulnerability typically rated given that the GSI rated the area around the site as moderately permeable subsoils means that 1.5 to 8 metres of subsoils exist within the site. This has been supported within the hydrogeological site investigation where trial pitting established a depth of soils across the site varying from 1400mm to 5800mm across the site. The aquifer. The soils underlying the site are a limestone till of the soil group of Grey brown podzolic a deep and well drained material and again the trial pitting would appear to verify this. The aquifer underlying the site is a locally important aquifer which is generally moderately productive. The assessment states that the likely groundwater flow is in the direction of the Loughmore Common Turlough. This would likely be the expected groundwater flow towards this water feature given the lack of other watercourses in the area and the relative level ground in the area. The applicant has not definitively established the direction of groundwater flow in the area. A groundwater gradient would appear to be evident given the disparity between the groundwater strikes at MW-1 and MW-2, 5.4 metres and 8.2 metres BGL respectively.

The hydrogeological site investigation report submitted focuses on 2 key facets pertaining to the previous activities onsite and the potential for residual contamination. These are as follows:

Ground waters: The applicant bored 2 groundwater wells for the purpose of assessing the condition of the groundwaters underlying the site with both wells being located downgradient of the previous scrap metal activity site. In field measurement for the following parameters was carried out pH, Conductivity and temperature with all falling within range. Further analysis of the groundwater was carried out for the following parameters given the previous activities at the site, these parameters are as follows, heavy metals (lead, nickel, copper, zinc, arsenic, antimony, cadmium, chromium and mercury) in addition to the following VOC's, Petrol range organics, diesel range organics, benzene, toluene, ethylbenzene, Xylene and PAH's. There was no detection of the following parameters within the groundwaters, PAH's, Petrol range organics, diesel range organics, benzene, toluene, ethylbenzene, Xylene. There was no detection of heavy metals within the groundwaters with the exception of Nickel which was detected at 5mg/l which is below the parametric value of 20 mg/l for Nickel in the drinking Water Regulations 2023 and is also below the EPA's interim guidance value. There is no legacy issue relating to groundwaters from the previous site activity and

from this we can also state that the previous activities onsite have not impacted the condition of the groundwaters (aquifer) underlying the site.

The applicant undertook soil analysis excavating 12 trial pits all the way to bedrock which appeared to be typical of karst limestone and based on the description of the bedrock it would appear to be epikarst which highly irregular and fractured. In field evidence pointed to no contamination of the soils, samples were further analysed for the following parameters

VOC's, Petrol range organics, diesel range organics, benzene, toluene, ethylbenzene, Xylene and PAH's. The applicant utilised an EPA list showing indicative of typical background levels in Irish soils and the Dutch Quality Guidelines. Overall the returned results would appear to indicate that previous activities on the site have not impacted on the soil quality at the site subject of this development. There were some elevated results for Nickel and Copper but these fall well within the ranges expected to be observed in Irish soils. Minor elevations in lead within trial hole 7 were observed marginally exceeding the levels expected in Irish soils but well below the Dutch Interim guidance value of 530mg/kg. Overall it can be said that the report has demonstrated that the previous activities on this site have not impacted on the underlying soils and groundwaters.

A brief background on the Turloughs to help understand the potential for impact. Turloughs are ephemeral lakes by nature and are classified under the Water Framework Directive as Groundwater Dependent Terrestrial Ecosystems (GWDTE's) and a priority habitat under the Habitats Directive. These fill primarily by inflows of groundwater via conduits and springs and by the input of some surface water runoff. Whilst the hydrogeological report submitted addresses the existing condition of the site and its impacts to the site from previous site activities it neglects to address the potential for impacts from the proposed development on the pNHA Loughmore Commons Turlough. They conclude that no contamination has been identified in the soils or groundwaters beneath the site and as such they state that consequently there will be no risk to Loughmore Commons Turlough.

However during the trial pitting the applicant referenced as undulating and very broken rock which would be typical of Karst. This could be epikarst and can have a bearing on the rate and quantity of recharge entering the locally important aquifer underlying the site. Epikarst can be described as the unsaturated zone of the limestone near the surface where significant weathering and fracturing and solutional enlargement can occur. Typically depths of where epikarst is found ranges between 3-10 metres below

ground which would appear to correlate with the depths to rock on the site. This rock is often highly irregular and fractured with a high level of permeability due to chemical solution occurring within this zone. These fractures tend to reduce with depth giving way to largely un-weathered rock below with diminishing permeabilities with increasing depth. This leads us to conclude that the connectivity between epikarst and water table can be sporadic at best. Given that permeability decreases with depth recharge to the aquifer is limited. The GSI has the site mapped the recharge coefficient for the site at as a limestone till and a cut peat with recharge coefficients of 60% and 10% respectively. Given the proximity of the cut peat to the site its reasonable to assume that the mapping may not be as accurate down at the site scale and that this poorer draining component may form part of the site, and given this subsoil conditions there may very well be negligible impact on the condition of groundwaters from the proposed development however the potential for the impact on the dynamic of groundwater flow through the site has not been addressed with particular regard to conservation of the pNHA Loughmore Common Turlough. Any impact on the surface waters from the proposed development has not been addressed in the report either.

In my opinion the report concentrates on demonstrating the condition of the soils and the groundwaters underlying the site after its previous activities on the site but it does not further develop this to adequately ascertain if there would be any hydrological, hydrogeological or other impacts (either by way of surface water or groundwater) from the proposed development on pNHA Loughmore Commons Turlough.

Emmet Smyth,
Inspectorate Scientist
Date: 4th July 2025.