Technical Note to Inspector

ABP-321519-25

Development	Construction of dwelling house, installation of wastewater treatment system, and for all associated site works
Location	Dromsullivan South, Bantry, Co. Cork
Planning Authority	Cork County Council
Planning Authority Reg. Ref.	24500
Applicant(s)	Shauna O'Sullivan
Appellant(s)	Eugene O'Sullivan
Type of Application	Normal Planning Appeal
Inspector	Aisling Mac Namara
Scientist	Finbarr Quigley

Contents

1.0 Scope of Report

1.1.1. This note to the Inspector and available to the Commission is a written record of my review and examination of the submitted information provided by the applicant as it relates to certain environmental concerns around the development. In my capacity of Inspectorate Environmental Scientist, I have the relevant expertise to provide a professional opinion as to the adequacy of the information for the Inspector and the Commission to undertake a decision.

1.1.2. I have been requested to provide an opinion on the following aspects of the project:

- Whether or not the presence of made ground impacts a sites suitability for on-site wastewater treatment systems and on-site disposal of surface water,
- Concerns regarding the adequacy of the tests and the reliability of the conclusions,
- Whether separation distances and the design of the system is as per EPA Code of Practice,
- Whether site flood risk assessment is warranted,
- Whether the proposed well is at risk from potential surface water flooding and;
- Whether groundwater can accommodate proposed abstraction for new well

For the purpose of this technical note, I have reviewed the following documentation and reference material:

- The GSI Groundwater Data viewer www.gsi.geodata.gov.ie
- Code of Practice for Domestic Wastewater Treatment Systems (p.e. <10), EPA 2021
- Code of Practice for Domestic Wastewater Treatment Systems (p.e. <10), EPA 2009
- The OPW Floodinfo website www.floodinfo.ie
- Cork County Council Development Plan 2022 Map Browser www.corkcocoeur.maps.arcgis.com
- The appeal documents

2.0 Issues examined and suggestions for consideration

2.1. Presence of imported material

2.1.1. The site in question had a total of three trial holes excavated as part of the assessments carried out in relation to the suitability of the site for an onsite wastewater treatment system. Having reviewed all available trial hole logs and photographs there is no evidence that made ground (imported material) was encountered in any of the trial holes. The site suitability assessment report made no reference to imported material being present at the trial hole or percolation test hole locations.

2.1.2. The Area Engineers report following an inspection of the site on the 17th October 2024 included the following comment “There appeared to be a lot of material dumped on the site” but no further reference to the nature, quantity or exact location of this material was referenced in this or any further documents relating to the application.

2.1.3. Given that the photographs of each of the three trial holes examined appeared to show natural ground (soil, subsoil and bedrock) conditions and not imported material above the bedrock, it is appropriate to consider that the percolation tests carried out and reported related to the ability of the naturally occurring soil, subsoil and bedrock to attenuate wastewaters. Therefore, the presence or otherwise of imported material in other parts of the site would have no significant impact on the suitability of the site to safely attenuate the wastewater volumes proposed.

2.1.4. The proposal is to dispose of surface waters arising on site to a new soakaway area to be located to the east of the proposed sand polishing filter. This new soakaway will be designed in accordance with BRE Digest 365 procedures and there is no evidence that the presence of imported material on site will have a significant impact on the ability of the existing ground conditions to safely attenuate the surface water arising.

2.2. Site suitability assessment and the reliability of the conclusions

2.2.1. The site suitability assessment was carried in accordance with the requirements of the 2021 Code of Practice (CoP). In part 2.0 (General Details) of the Site

Characterisation Form, the sites groundwater vulnerability was incorrectly identified as High when it is Extreme (with rock present at or near the surface). Given that the Aquifer Category was noted to be Locally Important, the correct Groundwater Protection Response for the site was therefore R2[1] and not R1 as reported in the form submitted. This R2[1] response suggests the site could be suitable subject to normal good practice. Where domestic water supplies are located nearby, particular attention should be given to the depth of subsoil over bedrock such that the minimum depths required in Chapter 6 are met and the likelihood of microbial pollution is minimised.

Figures 2.1 and 2.2 Groundwater Vulnerability and Bedrock Aquifer data for the site

2.2.2. The trial hole log (Section 3.2) showed that the trial hole was excavated to 1.5m below ground level (bgl) where bedrock was encountered making further excavations unnecessary. This log appeared to show that the topsoil extended to 400mm bgl and a SILT/CLAY subsoil was noted down to 950mm bgl. The photographs of this trial hole submitted with the site assessment are somewhat unclear but do appear to show significant depths of fractured bedrock in the trial hole which is in line with the GSI map data which suggests that bedrock is at or near the surface at this location. No water or evidence of mottling was noted in the trial hole indicating that winter water levels are not likely to be above 1.5m bgl.

2.2.3. No subsurface percolation tests were conducted as part of the assessment. A surface percolation test was undertaken and a percolation value (PV) of 22.58 was recorded. The rationale for not undertaking the subsurface percolation test was not explained in the report however, it is assumed that this was due to the presence of bedrock in the trail hole within 1.5m bgl.

2.2.4. The report states that the surface percolation tests 'passed' and that a 6-person tank & filter with a PV of 22.58 required a depth of 1200mm free draining subsoil below the filter. Section 5.0 and 6.0 of the report concluded that a P6 Pumped Secondary Treatment Plant (compliant with EN12566-3) would be installed followed by a sand polishing filter.

2.2.5. Table 6.3 of the CoP describes the minimum unsaturated soil and/or subsoil depth requirements depending on the proposed methos of disposal. For polishing filters following secondary systems and infiltration areas following tertiary systems in a location with a GWPR of R2[1] the minimum depth of soil/subsoil is 0.9m. According to the trial hole log, this site has 0.95m of subsoil which makes it complaint with the depth requirement.

2.2.6. The Area Engineers report following an inspection of the site on the 17th October 2024 included the following comment "there is some worry about the percolation properties of the in-situ soil. The applicant shall be requested to open new trial hole adjacent to the proposed percolation area to confirm the soil profile and the water table depth." As a result of this, the applicant excavated two further trial holes on site and reported the findings of those trial holes in further information submitted to the PA on 13th November 2024.

2.2.7. The results of the new trial hole assessments showed that the water table was encountered at 1.18m bgl. The photographs of both of the new trial holes appeared to show significant depths of fractured bedrock (grey material) present in both excavations which again is in keeping with the GSI mapping for the site. Based on the photographic evidence and the GSI mapping, I do not believe the trial holes have demonstrated adequate (0.9m) depth of soil/soil above the water table or bedrock.

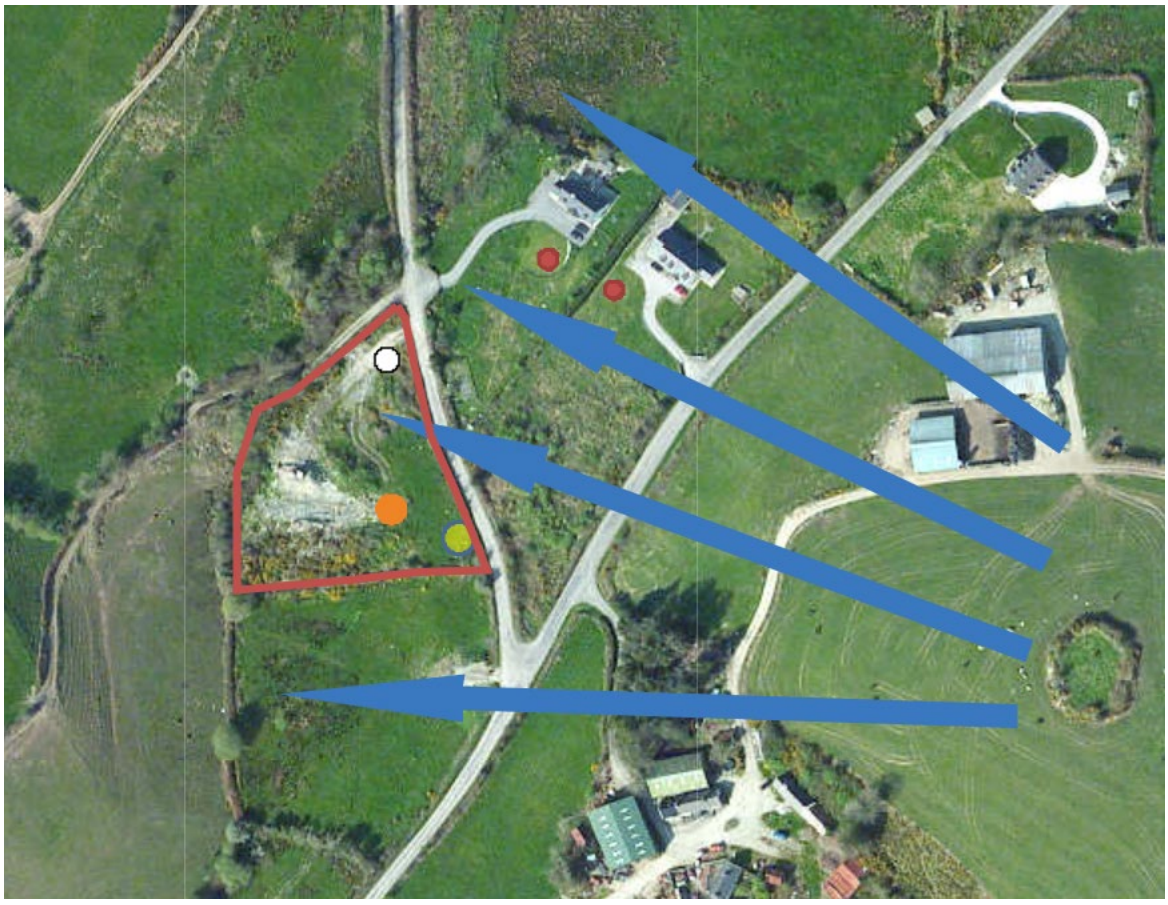
2.3. Whether separation distances are as per EPA Code of Practice

2.3.1. The minimum separation distances as outlined in Table 6.2 of the CoP can be achieved for all identified features which relate to this site. In particular, the upgradient domestic well distance of 15m is easily achieved from this location. However, Table 6.2 does identify that the soakaway for surface water drainage should be located down-gradient of the infiltration-treatment area. In this case, the applicant proposed to install the surface water soakaway upgradient of the

infiltration-treatment area. This should be highlighted as an issue that can be addressed through a condition, if the appeal is not successful. The proposed surface water soakaway should be moved to a downgradient location.

The location of the proposed drinking water well and its location relative to neighbouring wastewater treatment system was raised. Figure 2.3 shows the approx. location of the proposed well (in white) relative to the neighbouring wastewater treatment systems (in red) and the blue arrows indicate the groundwater flow direction. The groundwater is considered to be flowing from the elevated position to the ESE of the site towards the surface watercourse which runs along the NW and W boundary of the site.

Figure 2.3 Groundwater flow and location of features on the site



2.3.2. Given the groundwater flow direction, the wastewater from the neighbouring dwellings could be considered to be up-gradient from the proposed well at distances of 55m and 70m. The CoP specifies distances which new wastewater treatment systems should be located from existing wells and is not designed to be used as a guide to locating a new well. The EPA Safesystem Guidance on private well

protection and maintenance recommends that homeowners ensure that a wastewater system including septic tanks are not located within 30m of a well. The Institute of Geologists of Ireland have produced a guidance document (link) on Water Well Construction which identified that the minimum recommended distance (m) of a private well from likely pollution sources (incl. septic tank percolation area) was between 30 and 60m depending on the type and depth of subsoil present above bedrock. The proposed separation distances of 55m and 70m are considered to be sufficient to ensure the protection of drinking water supplies given the high groundwater vulnerability present at the two septic tanks near this site which indicates soil depths between 3-5m.

Figure 2.4 Excerpt from IGI Guide to Water Well Construction

Table 1. Recommended distance of a private well from likely pollution sources[1]

Type of subsoil	Depth of subsoil above bedrock* (metres)	Minimum distance (metres) where groundwater flow direction is known or can be estimated				Minimum distance (metres) where groundwater flow direction is unknown	
		up-gradient from well		*down-gradient from well*			
		farmyard	*septic tank percolation area/polishing filter/ oil tank*	*farmyard*	*septic tank percolation area/polishing filter/ oil tank*	*farmyard*	*septic tank percolation area/polishing filter/ oil tank*
Clay or Silt/Clay (low permeability, poor drainage)	1 - 3	100	40	50	15	100	40
	>3	75	30			75	30
	> 8	60				60	
Sandy clay, silt (moderate permeability)	1 - 2	120	45	50	15	120	45
	2 - 8	90	30			90	30
	> 8	90	30			90	30
Sand and gravel (high permeability, free draining)	1 - 2	150	60	50	15	150	60
	2 - 8	150	40			150	40
	> 8	120	30			120	30

2.4. Whether the design of the system is as per EPA Code of Practice

2.4.1. The applicant proposed to install a P6 Pumped Secondary Treatment Plant (compliant with EN12566-3) followed by a sand polishing filter. In Section 5.0, the applicant has proposed to install a $3m^2$ sand polishing filter. The size of this filter was calculated using a formula which is no longer applicable and in any case was incorrectly applied in this instance. The formula used in the report came from an

amendment to the 2009 version of the CoP which was published by the EPA in 2012. The formula was:

A = 0.125 x T^1, where A is the area (m^2/p.e.) of subsoil required for the discharge of tertiary treated effluent. T^1 is the T or P-Value (subsurface or surface percolation value).

The applicant calculated A to be 0.125 x 22.58 = 3 (rounded up from 2.82). However they should also have multiplied this value by the p.e. to be served. The value of A from the equation should have been 2.82 x 6 = 16.9m^2.

The 2021 CoP removed the need for this calculation and included a new method of calculating the required size of sand polishing filter and infiltration areas.

2.4.2. The 2021 CoP (Section 10.2.1) requires that the hydraulic loading of sand polishing filters used for tertiary treatment of wastewater from secondary treatment systems should not exceed 60l/m^2/day. The proposed development has been calculated to generate 900l/day (6 p.e x 150l/person/day) therefore, the required surface area for the sand polishing filter is 900/60 = 15m^2 which must be a minimum of 900mm deep. The final effluent from this sand polishing filter should be evenly discharged to a 300mm deep gravel distribution area sized in accordance with Table 10.1 (option 6) to be 7.5m^2 x 6 p.e. = 45m^2 in area.

2.4.3. In conclusion, based on the information submitted in the site assessment form, my calculations have shown that the dimensions of the sand polishing filter and infiltration bed to serve the proposed development should have been a 15m^2 sand polishing filter sitting on a 45m^2 gravel infiltration bed. The applicant has proposed that a 3m^2 sand filter be installed with a loading rate of 300l/m^2/day which is not in compliance with the CoP, 2021. This design could lead to overloading and potential failure of the sand polishing filter. Therefore, the onsite wastewater treatment system proposed should not be permitted.

2.5. Flood risk assessment

2.5.1. The appeal submission suggested that some of the site had flooded during an extreme weather event in 1986 (Hurricane Charlie). This submission also referred to flooding along the public road adjacent to the site during the same event and highlighted an increased risk of the site flooding due to the proposed new entrance.

2.5.2. The Area Engineer from the PA searched the PA Catchment Flood Relief Assessment and Management drawings and concluded that the site in question was located in Flood Zone C which covers areas considered to have a low probability of flooding from fluvial or tidal sources. The Engineers report suggested that the watercourse next to the site was not identified as a flood risk on the internal PA mapping and the nearest identified risk area was located 200m downstream of the site in question.

2.5.3. The Flood Zone Maps included in the Cork County Development Plan 2022-2028 were assessed and the site was found to be outside Flood Zones A and B.

Figure 2.5 Cork County Development Plan 2022-2028 Flood Zone A Map for the area surrounding the proposed development

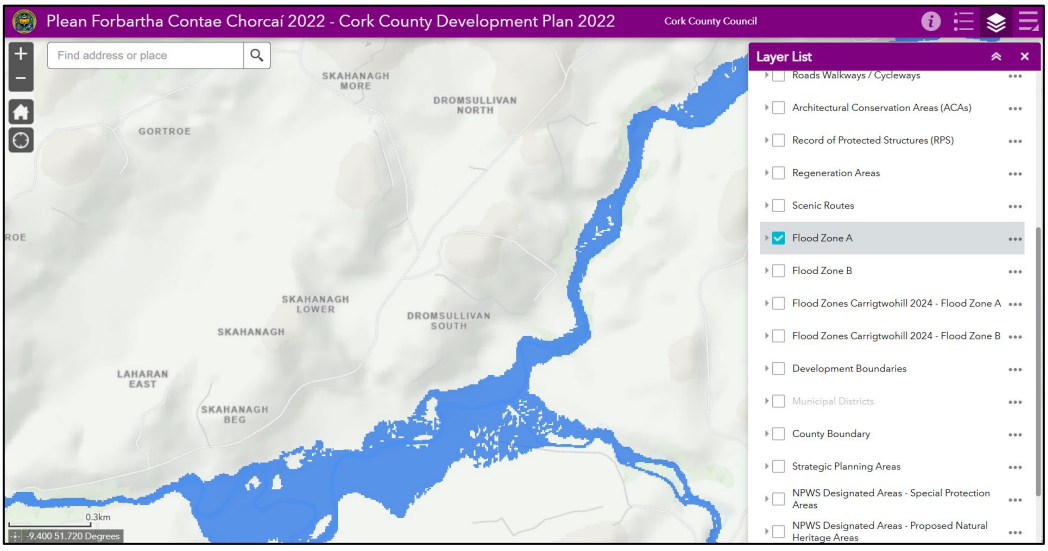
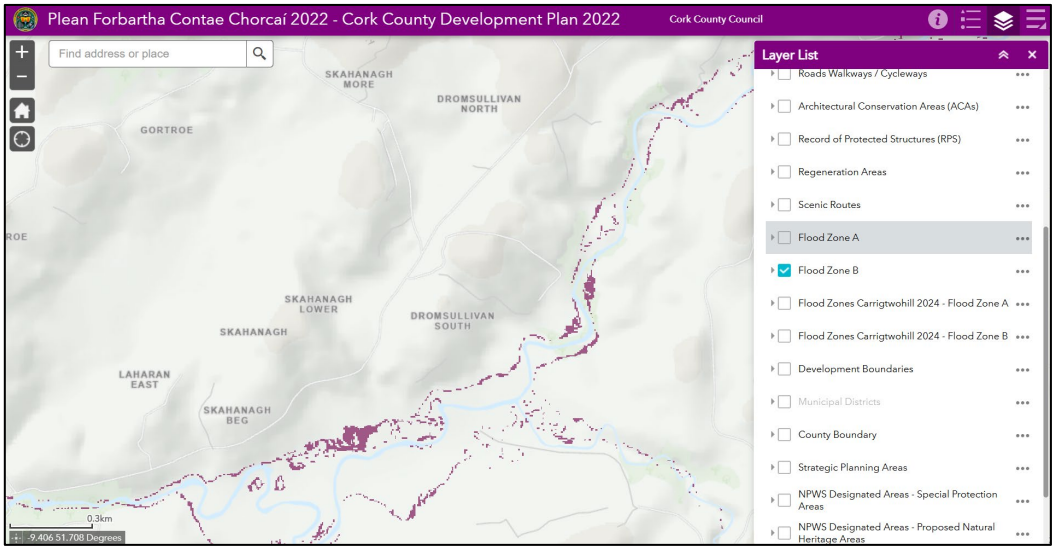


Figure 2.6 Cork County Development Plan 2022-2028 Flood Zone B Map for the area surrounding the proposed development



2.5.4. The OPW Flood Maps website (www.floodinfo.ie) was searched for evidence of historic flooding records for the location in question. Despite there being records of flood events for other locations (not nearby) since the early 1980's present on the website, none were found that related to the site in question. The OPW National Indicative Flood Maps (see figures 2.7 and 2.8) were assessed and the location was not within the Low or Medium Probability areas identified adjoining the river Mealagh to the south of the site.

Figure 2.7 OPW 1 in 100 (Medium Probability) Flood Map for the area surrounding the proposed development

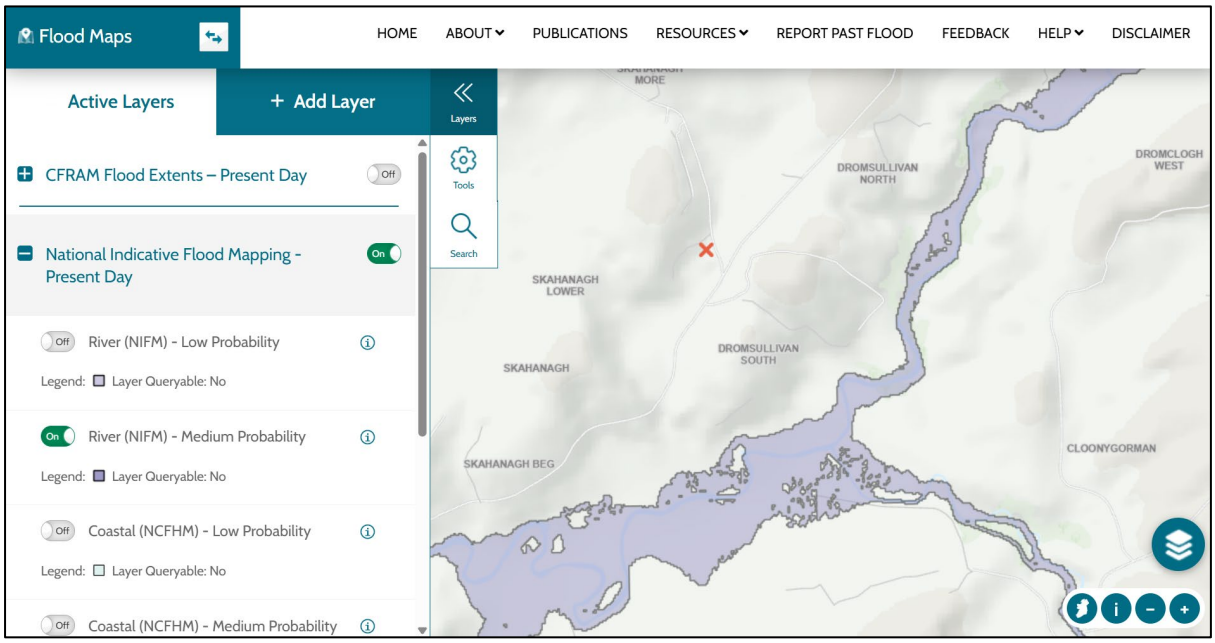
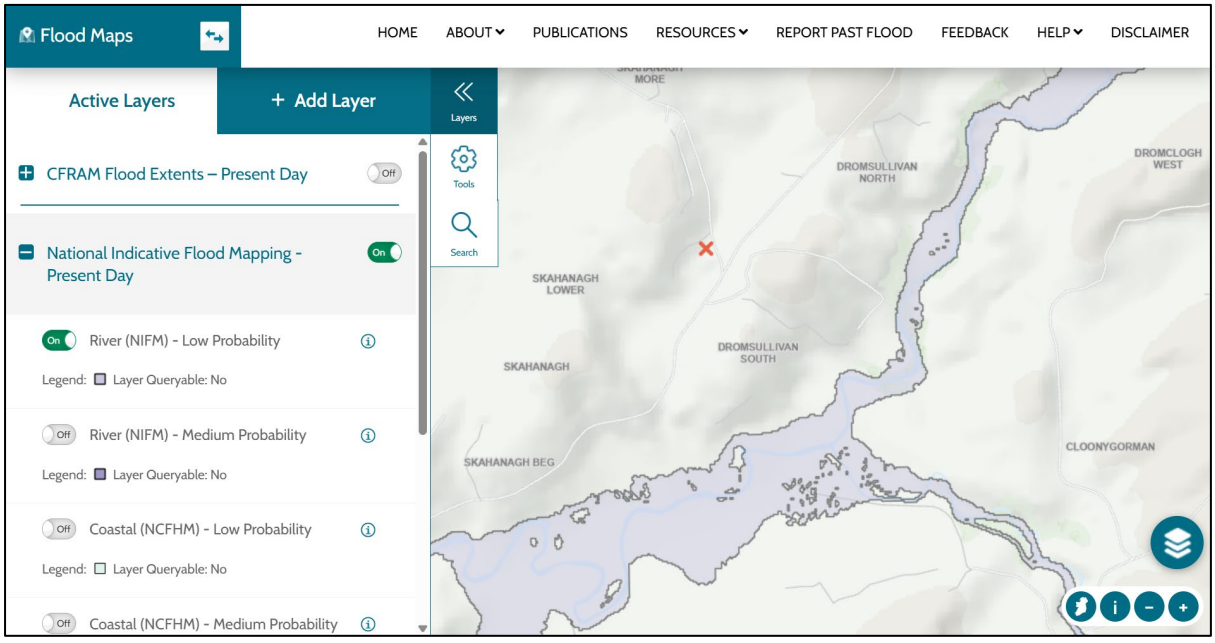


Figure 2.8 OPW 1 in 1000 (Low Probability) Flood Map for the area surrounding the proposed development



The proposed development site in question is elevated approx. 20m above the areas identified as being at Moderate risk of flooding. This suggests that areas at significantly lower elevation will flood before the site in question becomes at risk of flooding events.

2.5.5. The proposed development is not located in an area recognised by the PA or the OPW Flood Maps to be at risk of flooding. The appellant has not provided any documentary evidence of historical flooding at the site in question therefore; I do not believe a site-specific flood risk assessment is required.

2.6. Well head protection

2.6.1. The Institute of Geologists of Ireland have produced a guidance document (link) on Water Well Construction and the well head should be constructed in accordance with the requirements of Section 2.6 of this guidance document. Given that flooding is not considered to be a risk at this site (Section 2.5 above) there is no evidence that the well head cannot be protected adequately to prevent contamination of the well, through standard installation measures.

2.7. Groundwater Resource Assessment

2.7.1. The proposed site is located in an area overlying a Locally Important Bedrock Aquifer which is Moderately Productive only in Local Zones. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m3/d). In these bedrock aquifers, groundwater predominantly flows through fractures, fissures, joints or conduits.

2.7.2. Given the current low density of wells in the vicinity of the proposed development, I do not believe that the groundwater resource at this location will be impacted quantitatively by the installation of the proposed well which will serve one dwelling.

Finbarr Quigley
Environmental Scientist

22nd August 2025