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ENVIRONMENTAL IMPACT ASSESSMENT SCREENING REPORT FOR A PROPOSED MODULAR HOUSING DEVELOPMENT POLLBOY, COUNTY GALWAY

Report Prepared For

The Commissioners of Public Works in Ireland on behalf of the Department for Children, Equality, Disability, Integration and Youth

Report Prepared By

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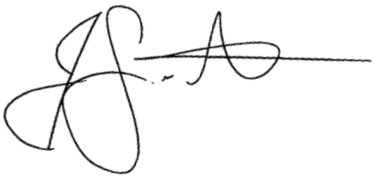
Signature		
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1.0 INTRODUCTION

On behalf of The Commissioners of Public Works in Ireland on behalf of the Department for Children, Equality, Disability, Integration and Youth ('the Applicant'), AWN Consulting Limited ('AWN') has prepared the following Environmental Impact Assessment (EIA) Screening Report as part of a Modular Housing Development located in Pollboy, Ballinasloe, County Galway.

The proposed development will consist of the construction of 64 no. modular housing units to provide emergency temporary accommodation for up to 256 no. Ukrainian refugees and 101 no. car parking spaces to accompany the dwellings.

The proposed development site (hereafter referred to as 'the Site') consists of c. 4.7 ha of greenfield land outlined in red on Figure 1.1. The proposed development is described in further detail in Section 2 of this EIA Screening report.

The proposed development site is to the south of Ballinasloe town centre. The development site is bound to the west by and north by residential housing, to the east by Poolboy Cottages road. The southeast, and east of the site includes a several light commercial buildings; which include businesses such as An Post Sorting Office, Cooper Leisure, KPW Print management, NCT Centre, and Western Post Form Limited Furniture Makers. The M6 Dublin-Galway motorway is located further to the south.

Figure 1-1 *Proposed development site (indicative in red) (Source: Google Earth)*

1.1 REQUIREMENT FOR EMERGENCY HOUSING

The European Union (Planning and Development) (Displaced Persons From Ukraine Temporary Protection) Regulations (S.I. No. 306 of 2022) are made under Section 3 of the European Communities Act 1972 (No. 27 of 1972) for the purpose of giving effect to Council Directive No 2001/55 EC (the Temporary Protection Directive), and Council Implementing Decision EU 2022/382 of 4 March 2022, to provide immediate protection in EU countries for persons displaced by the Russian invasion of Ukraine, including the need to provide emergency accommodation and support to these displaced persons.

The Regulations relate to the non-application of the Planning and Development Act 2000 (as amended) to certain classes of development by or on behalf of a State authority, which is defined as a Minister of the Government or the Commissioners of Public Works in Ireland. The provisions of the Planning and Development Act 2000 (as amended) shall not apply to the specified classes of temporary development in the Schedule only for so long as the regulations are in force. After this time the removal, demolition or alteration of any temporary structure and the discontinuance of any temporary use and, in so far as is practicable, the restoration of the land to its condition prior to the commencement of the development, shall be required, unless the development is permitted, exempted or otherwise regularised by a provision of the Planning and Development Act 2000, or the Regulations thereto. The classes of development listed in the Schedule may include the change of use and repurposing of existing buildings and facilities, and temporary newbuild accommodation and structures to address the urgent need to provide emergency accommodation and support to displaced persons from the conflict in Ukraine.

In accordance with the Temporary Protection Directive 2001/55/EC, the duration of temporary protection activated by European Union Council Decision EU 2022/382 of 4 March 2022 should be for an initial period of one year. Unless terminated under the terms of Article 6(1), point (b), of that Directive, that period should be extended automatically by six monthly periods for a maximum of one year. At any time, the European Commission may propose to the Council to end the temporary protection, based on the fact that the situation in Ukraine is such as to permit the safe and durable return of those granted temporary protection, or propose that the Council extend the temporary protection by up to one year. As such, the maximum extended period for the duration of Temporary Protection Decision EU 2022/382, of 4 March 2022, shall be three years.

1.2 PURPOSE OF THIS REPORT

There is a mandatory requirement for an Environmental Impact Assessment Report (EIAR) to accompany a project for some types of development that meet or exceed the relevant “thresholds” specified in Schedule 5 to the Planning and Development Regulations. In addition to the mandatory requirement, there is a case-by-case assessment necessary for sub-threshold developments as they may be likely to have significant effects on the environment. If a sub-threshold development is determined to be likely to have a significant effect on the environment, then an EIAR will be required.

The proposed development and component parts have been considered, as documented in Section 2, against the thresholds for EIA as outlined in the Planning and Development Regulations 2001 (as amended). The proposed development is a sub-threshold development and is not mandatory for EIA.

The second reason for this report is to document the studies undertaken by the Applicant, and the design team, to consider whether the development would be likely to have significant effects on the environment.

AWN, along with the project team, have undertaken an assessment of the effects on the environment from the proposed development and has concluded that there is no real likely significant environmental effects on the receiving environment for the proposed development, therefore a subthreshold EIA is not required. The assessment is documented in Section 3.0, 4.0 and 5.0 and covers each aspect of the environment in accordance with guidance including Population and Human Health; Biodiversity; Land, Soils, Geology, Hydrogeology, and Hydrology; Air Quality and Climate; Noise and Vibration; Landscape and Visual Impact; Cultural Heritage, and Archaeology; Traffic and Transportation; Material Assets, and Waste.

The information presented in this report will enable the competent authority (OPW) to undertake a screening determination in respect of the need for an EIAR for the proposed development.

1.3 EIA SCREENING LEGISLATION AND GUIDANCE

The legislation and guidance listed below has informed this report and the method to EIA Screening:

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports. (2022). Environmental Protection Agency.
- Environmental Impact Assessment Screening, OPR Practice Note PN02 (Office of the Planning Regulator, 2021).
- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018.
- Environmental Impact Assessment of Projects – Guidance on Screening. (2017). European Commission.
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. (August 2018). Department of Housing, Planning and Local Government.
- European Union (Planning and Development) (Displaced Persons From Ukraine Temporary Protection) Regulations (S.I. No. 306 of 2022)
- European Union Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended by 2014/52/EU.
- Planning and Development Act, 2000 (as amended).
- Planning and Development Regulations 2001 (as amended).

The screening process followed in this report is in accordance with the EIA Directive 2011/92/EU of the European Parliament and of the Council as amended by 2014/52/EU and as transposed by the Act and the Regulations and follows the format as per Section 3.2 of the EPA Guidelines (2022). The potential for significant effects of the proposed Project has been considered against the criteria under Annex II A of the EIA Directive 2011/92/EU as amended by 2014/52/EU and Schedule 7 of the *Planning and Development Regulations, 2001* as amended.

1.4 SCREENING METHODOLOGY

The screening process followed in this report is in accordance with the EIA Directive 2011/92/EU of the European Parliament and of the Council as amended by 2014/52/EU and follows the format as per Section 3.2 of the EPA Guidelines (2022).

The key steps to screen for an EIA is set out in Section 3.2 of the EPA Guidelines are as follows:

1. Is the development a type that that requires EIA?
2. Is it of a type that requires mandatory EIA?
3. Is it above the specified threshold?
4. Is it a type of project that could lead to effects? and/or
5. Is it a sensitive location? and/or
6. Could the effects be significant?

The information required to be submitted by the developer for the Planning Authority to make a determination on EIA Screening is set out in Schedule 7A of the Regulations of 2001 (see also Annex IIA of the EIA Directive).

However, it is important to note that Schedule 7A states '*The compilation of the information at paragraphs 1 to 3* [of Schedule 7A] *shall take into account, where relevant, the criteria set out in Schedule 7*.' Having regard to this for the purposes of compiling the relevant information on the likely effects of the proposed development and in order to address points 4 to 6 above, an evaluation of the characteristics of the project, the sensitivity of the location of the proposed development, and the potential for significant impacts has been made with regard to Schedule 7 of the Regulations.

Schedule 7 of the Regulations of 2001 sets out the criteria for the Planning Authority to determine whether a development would or would not be likely to have significant effects on the environment. The criteria are broadly set out under the three main headings:

1) *Characteristics of proposed development* (Report Section 3.0)
   - *a. the size and design of the whole of the proposed development,*
   - *b. cumulation with other existing development and/or development the subject of a consent for proposed development for the purposes of Section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment,*
   - *c. the nature of any associated demolition works,*
   - *d. the use of natural resources, in particular land, soil, water and biodiversity,*
   - *e. the production of waste,*
   - *f. pollution and nuisances,*
   - *g. the risk of major accidents, and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge, and*
   - *h. the risks to human health (for example, due to water contamination or air pollution).*

2) *Location of proposed development* (Report Section 4.0)
   - *a. the existing and approved land use,*
   - *b. the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground,*

c. *the absorption capacity of the natural environment, paying particular attention to the following areas:*
   i. *wetlands, riparian areas, river mouths;*
   ii. *coastal zones and the marine environment;*
   iii. *mountain and forest areas;*
   iv. *nature reserves and parks;*
   v. *areas classified or protected under legislation, including Natura 2000 areas designated pursuant to the Habitats Directive and the Birds Directive and;*
   vi. *areas in which there has already been a failure to meet the environmental quality standards laid down in legislation of the European Union and relevant to the project, or in which it is considered that there is such a failure;*
   vii. *densely populated areas;*
   viii. *landscapes and sites of historical, cultural or archaeological significance.*

3) *Types and Characteristics of Potential Impacts* (Report Section 5.0)

The likely significant effects on the environment of proposed development in relation to criteria set out under paragraphs 1 and 2, with regard to the impact of the project on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment report' in Section 171A of the Act, taking into account—

a. *the magnitude and spatial extent of the impact (for example, geographical area and size of the population likely to be affected),*
b. *the nature of the impact,*
c. *the transboundary nature of the impact,*
d. *the intensity and complexity of the impact,*
e. *the probability of the impact,*
f. *the expected onset, duration, frequency and reversibility of the impact,*
g. *the cumulation of the impact with the impact of other existing and/or development the subject of a consent for proposed development for the purposes of Section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment, and*
h. *the possibility of effectively reducing the impact.*

However, it is important to note that Schedule 7A states '*The compilation of the information at paragraphs 1 to 3 [*of Schedule 7A*] shall take into account, where relevant, the criteria set out in Schedule 7*.' The main body of this report (Sections 3.0, 4.0 and 5.0) will cover Schedule 7A fully, but it has been set out to present the information under the headings provided for in Schedule 7 in order to assist in the screening assessment.

1.5 PROJECT TEAM AND CONTRIBUTORS TO THE EIA SCREENING REPORT

This EIA Screening Report and the proposed development has been informed by the accompanying documents submitted with the application (and the relevant listed mitigation measures as included therein). The preparation and co-ordination of this screening report has been completed by AWN and has relied on specialist input from the project design team and applicant, as per Table 1.1.

Table 1.1 *Applicants project team*

Role	Contributor
Applicant	Office of Public Works
Architectural Design	Coady Architects
Civil Engineering Design	DBFL Consulting Engineers
Landscape Design	Office of Public Works & O'Brien Landscaping
Population and Human Health; Land, Soils, Geology, Hydrogeology, and Hydrology; Air Quality and Climate; Material Assets; Waste Management; Noise and Vibration	AWN Consulting
Appropriate Assessment Screening Report	Moore Group
Archaeological, Architectural and Cultural Heritage Scoping Report	CRDS Archaeological and Historical Consultants
Hydrogeology (Groundwater Abstraction Feasibility Assessment and Synopsis Note)	McCloy Consulting

Each environmental specialist of the applicants project team was commissioned having regard to their previous experience in EIA; their knowledge of relevant environmental legislation relevant to their topic; familiarity with the relevant standards and criteria for evaluation relevant to their topic; ability to interpret the specialised documentation of the construction sector and to understand and anticipate how their topic will be affected during the construction phase and operational phases of development; ability to arrive at practicable and reliable measure to mitigate or avoid adverse environmental impacts; and to clearly and comprehensively present their findings.

This EIA Screening report was prepared by David Doran and Jonathan Gauntlett. David is a Senior Environmental Consultant with AWN Consulting. David has a MSc in Environmental and Energy Management (Hons). Recent projects include; project management of commercial and infrastructural EIARs, EIA Screening Reports, various EIAR Chapters, Operational and Resource Waste Management Plans for residential developments, office developments, logistics park developments and other, commercial, and industrial developments. David also works in the area of construction environmental compliance. Jonathan is a Principal Environmental Consultant in AWN Consulting with expertise in impact assessment, licensing, environmental compliance, and project management. Jonathan has a BSocSc (Environmental Planning) and BBA (Economics) from the Waikato University in New Zealand and has experience working in the environmental consultancy, planning, and regulatory fields from Ireland, the UK and New Zealand.

2.0 SCREENING EVALUATION

Schedule 5 of the Planning & Development Regulations 2001, as amended, sets out a number of classes and scales of development that require EIA. In considering the wider context and the component parts of the project the proposed development the thresholds of relevance to the proposal from Part 1 and Part 2, respectively of Schedule 5 are set out in Table 2.1 and Table 2.2 below.

Table 2.1 *Relevant Part 1 Schedule 5 Thresholds for EIA and determination of requirement of EIA*

Development for the Purposes of:	Related Development Details	Exceeds Threshold?
11. Groundwater abstraction or artificial groundwater recharge schemes, where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.	Conservatively, it is estimated that the maximum required groundwater abstraction for the proposed development is 12,775 cubic metres annually (35 cubic metres a day) which is below the threshold of 10 million cubic metres annually.	No.

Table 2.2 *Relevant Part 1 Schedule 5 Thresholds for EIA and determination of requirement of EIA*

Development for the Purposes of:	Related Development Details	Exceeds Threshold?
2. Extractive Industry – (e)(iii) drilling for water supplies, where the expected supply would exceed 2 million cubic metres per annum.	Conservatively, it is estimated that the maximum required groundwater abstraction for the proposed development is 12,775 cubic metres annually (35 cubic metres a day) which is below the threshold of 2 million cubic metres annually.	No.
10. Infrastructure projects - (b)(i) Construction of more than 500 dwelling units	The development will consist of 92 dwelling units which is below the threshold off 500 dwelling.	No
10. Infrastructure projects - (b) (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.	The proposed development is deemed to be conservatively located within 'other parts of a built-up area' and hence 10 hectares is the applicable threshold. The proposed development site is 4.7 hectares which is below the stated threshold.	No.
10. Infrastructure projects - (l) Groundwater abstraction and artificial groundwater recharge schemes not included in Part 1 of this Schedule where the average annual volume of water abstracted or recharged would exceed 2 million cubic metres	Conservatively, it is estimated that the maximum required groundwater abstraction for the proposed development is 18,250 cubic metres annually (50 cubic metres a day) which is below the threshold of 2 million cubic metres annually.	No.
15. Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.	The following Sections 3.0, 4.0 and 5.0 of this report will provide information on the characteristics of the proposed development; in order to provide information on the likelihood of the project to have significant effects on the environment from these works, having regard to the criteria set out in Schedule 7	Determined by this EIA Screening Report.

2.1 CONCLUSION – SUB THRESHOLD DEVELOPMENT

The proposed development is '*of a type set out in Part 2 of Schedule 5 [in the Planning and Development Regulations, 2001 (as amended)] which does not equal or exceed, as the case may be, a quantity, area or other limit specified in that Schedule in respect of the relevant class of development*'. The development is outside the mandatory requirements for EIA and is considered to be sub-threshold for the relevant project type.

An EIAR is still required by to accompany a planning application for sub-threshold development which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7. Therefore, it is also necessary to consider whether an EIAR is required because the development will be likely to have

significant effects on the environment, even though it does not meet nor exceed the relevant thresholds in Schedule 5 to the Planning and Development Regulations.

The remainder of this report presents the information required by Schedule 7A and Annex II A of the Directive to demonstrate the likely effects on the environment, having regard to the criteria set out in Schedule 7 and Annex II A of the Directive.

The following Sections 3.0, 4.0 and 5.0 will provide information on the characteristics of the proposed development, the location and context, and its likely impact on the environment. These sub sections also include in accordance with Article 299B(1)(c) a description of any features, if any, of the proposed development and the measures, if any, envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment of the development.

These sections present the information required under Schedule 7A of the Regulations, to ensure that each aspect for consideration is robustly addressed and to enable a screening to be carried out in accordance with the criteria in Schedule 7 to the Regulations.

3.0 CHARACTERISTICS OF PROPOSED DEVELOPMENT

This section addresses the characteristics of proposed development by describing the physical characteristics of the whole proposed development and, where relevant and a description of the location of the proposed development, with regard to the environmental sensitivity of geographical areas likely to be affected.

3.1 SIZE AND DESIGN OF THE PROPOSED DEVELOPMENT

The development will consist of the installation of 64 no. modular housing units, 101 no. car parking spaces, bin store, bicycle storage space in rear garden, pavements, public lighting, landscaping, foul water, surface water, and potable water connections, and all ancillary site development works. The total site area for the proposed works is c. 4.7 hectares.

The development includes c 22,650$m^{2,}$ hectares of landscaped open spaces, tree cover of 5 no. various tree types including c. 4,450 m^2 woodland mix is also to be provided across the proposed development.

Vehicular access to the proposed development will be via proposed access way on Poolboy Cottages road. The modular houses are high spec bungalows, with a BER rating capable of A2. Each of the dwellings will have a private rear garden and semi-private front curtilage areas.

The proposed site layout is shown in Figure 3.1 below.

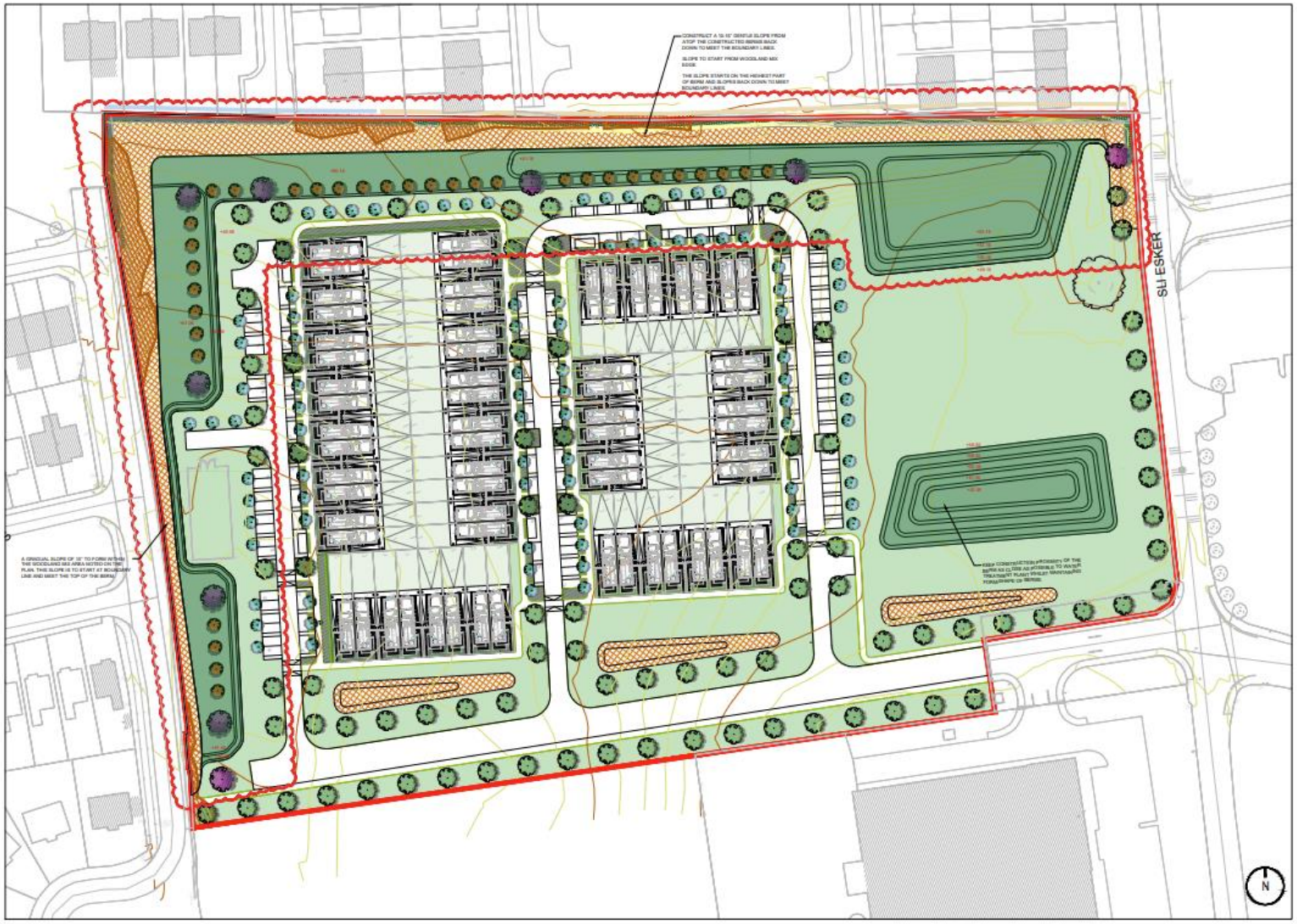

Figure 3-1

Proposed Site Layout

3.1.1 Construction Phase

As the proposed development is modular units, the majority of the construction works will occur off site. The estimated duration of onsite construction works is 6 – 9 months, there are no demolition works proposed.

Construction management, staff, and operatives is on average 70 personnel. This figure will rise to 120 during peak periods (4 weeks approximately). Construction traffic will access the site via Pollboy Cottages Road. There during peak periods there will be 90 cars / vans, and up to 30 – HGV per day.

The proposed construction project involves the establishment of a temporary construction compound to facilitate the construction activities at the designated site adjacent to the Site boundary. The compound will consist of a site office, welfare facilities, and storage areas for plant, machinery, and equipment necessary for the construction works. A single-storey stacked cabin arrangement will be utilised to accommodate various essential welfare facilities for the site personnel. These facilities include 4 no. split offices, 3 no. open plan meeting room, 3 no. canteens, drying room, 3 no. toilet blocks and 2 no. stores.

During construction, contractors will require temporary power for onsite accommodation, and construction equipment /plant. The power requirements will be relatively minor. The power requirements for the construction programme will be met through a combination of a generator and a battery pack system. This setup will provide a reliable and continuous power supply to support the operation of essential equipment and facilities throughout the construction phase.

Water will be required for welfare facilities, dust suppression and general construction activities. Water for the construction site compound will be sourced from tank storage, ensuring an adequate and reliable water supply for various purposes. The operational potable water supply for will be established during the construction phase for via the drilling of an onsite well and construction of associated infrastructure for groundwater abstraction.

There will also be foul wastewater requirements associated portable sanitary facilities within the construction compound. To manage foul waste effectively, tanks will be installed beneath the site cabins. These tanks will be used for collecting and storing foul waste generated within the compound. Regular emptying of these tanks will be carried out on a weekly basis or as needed, using a specialised sucker truck to ensure proper waste disposal and maintain a clean and hygienic environment.

All topsoil retained on site. There will be a requirement for removal of c 5,000 m^3 of subsoil and stones and import of c. 10,500 m^3 of engineering fill materials through the construction phase. Other construction activities will include site storage of cement and concrete materials, fuels for construction vehicles.

During the construction phase, surface water will be managed within the site, and if required (subject to agreement with the local authority) discharged to the stormwater sewer located to the east of the site on Poolboy Cottages road.

For the duration of the proposed infrastructure works the maximum working hours shall be 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays. No working will be allowed on Sundays and Public Holidays. Where works are required outside of these hours, this will be agreed with the Local Authority and other relevant parties.

A Construction and Environmental Management Plan (CEMP) will be prepared by the construction contractor which will set out the construction techniques and methodologies which will be implemented during construction of the proposed development. The CEMP will implement the mitigation measures set out within this report to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection. The CEMP will be implemented and adhered to by the construction Contractor and will be overseen, and updated as required if site conditions change, by the Project Manager, Environmental Manager, Resource Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

Table 3.1 *Summary of key construction works*

Activity	Description of Activity
Site Preparation Works and Establishment of Construction Services	The primary activities that will be required during the Site preparation phase for the development will be the establishment of construction fencing and hoarding and site compound. The Site compound will provide office, portable sanitary facilities, equipment storage, parking etc for contractors for the duration of the works. All areas under construction will be fenced for security and safety purposes and temporary lighting supplied, as necessary. Tree protection areas will be established at an early stage in line with the project arborists/ecologists recommendations.
Site clearance and earthworks	This phase will include site clearance, vegetation removal, excavations and levelling of the Site to the necessary base level for construction. It is estimated that c 5,000 m^3 of topsoil, subsoil and stones that will need to be removed. Surveying and setting out for structures. All required enabling works and site investigations, surveying and setting out for structures, archaeological investigations (if required) are carried out. Install granular fill for roads and footpaths. Mature trees that will be retained will be fenced and root protection zones established. All spoil retained on site where possible and stockpiled on site. The excavation depth during construction will be c. 5.3 m below ground level.
Installation of Services	New electricity and telecommunications services ducts / infrastructure will be put in place to serve the various dwellings. This will be connections to existing mains and carried out in accordance with the requirements of the various service providers / authorities.
Foundations and Installation of Modular Houses	Foundations will generally be reinforced concrete pad footings incorporated into the concrete strips of pad foundations. The modular homes will be constructed off site in a series of sections and components and transported to the site. They will be assembled in place by the construction contractor utilising a variety of plant equipment including lifting crane. The estimated duration of onsite construction works is 6- 9 months.
Landscaping	After the main construction works are completed the hard and soft landscaping and reinstatement works for that phase will be carried out in accordance with the proposed landscaping design.

3.1.2 Operational Phase

The most significant environmental effects are expected to arise during the construction phase, with the potential impacts with the proposed developments operational phase relatively minor.

The proposed development, when operational, will generate typical anthropogenic impacts associated with the usual operation of a residential development. The main potential impacts are associated with additional traffic (associated air emissions), and surface and foul water emissions, visual impacts, biodiversity, and wastes generation due to changes from the current undeveloped site to a build environment.

A groundwater abstraction bore has been established during the construction phase for the operational phase potable water requirements. On site treatment will be undertaken to ensure that the requirements of the European Union (Drinking Water) Regulations 2023 are met. The abstraction borehole has been registered with the Environmental Protection Agency (EPA) in accordance with the European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261 of 2018). IN addition, any further requirements of the Local Authority, Health Service Executive (HSE) will be met.

The design of the stormwater drainage network for the proposed development has taken cognisance of the guidelines and requirements set out by Galway County Council (GCC) Drainage Division, which requires all new developments to incorporate the principles of Sustainable Urban Drainage Systems (SUDS). The proposed SUDS measures are bioswales and are designed to ensure that there are no negative impacts from stormwater leaving the site. A stormwater attenuation tank has also been incorporated into the developments design capable of storing 940 m^3 of stormwater equivalent to a 1 in 100 year storm event. Surface water from the operational development will discharge to the drainage location at the southeast corner of the site on Poolboy Cottages road. Surface water runoff from the site's internal road network will be directed to bioswales before entering the surface water network for the site. A hydrobrake to restrict run-off rate to the greenfield rate of 10.8 l/s and petrol interceptor are proposed prior to the surface water outfall.

Foul water connection will be made to the existing foul sewer at the southeast corner of the site on Poolboy Cottages road. It is proposed to establish a gravity sewer within the site which will drain to the existing infrastructure.

Once developed and operational the proposed development will generate regular vehicular trips on the surrounding road network. The proposed development will be accessed via one vehicular and pedestrian access point on Poolboy Cottages Road. Within the development site, the internal layout of the site has been designed in accordance with the Design Manual for Roads and Streets (DMURS). The internal street widths have been minimised to encourage low vehicle speeds. New tactile paving will also be implemented to denote the transitions between the existing segregated cycle / pedestrian facilities and new shared areas at the pedestrian crossing points. Traffic movements would be predominately from the residents themselves, but also from ancillary users such as waste collection, maintenance of private units and communal areas. A total of 101 no. car park spaces are proposed, in addition each of the proposed units will have access to their own secure private garden space.

There are pedestrian routes and public transport routes within reach of the development. Pedestrian facilities are available between the site and Ballinasloe town. Major bus routes operated by Citylink, Transport for Ireland and Aircoach are available from Ballinasloe town within a 20-minute walk of the site. Ballinasloe Train Station is located 3.0 km from the site with regular trains travelling to both Galway and Dublin.

The proposed development is anticipated to result in a range of waste streams during its operational phase, which commences after the project is fully completed and the properties are occupied. To ensure a convenient waste disposal process, each - residential property will have available area within private garden spaces for waste storage. When the time comes for waste collection, a licensed waste contractor will responsibly pick up the waste from these designated areas at curbside for collection of bins, recycling etc.

In the context of the Temporary Protection Decision EU 2022/382 the maximum extended period for the duration of the permitted use *(temporary protection for displaced persons from the Ukraine)* of the units is three years; therefore, the operational effects of the proposed development, in the context of this EIA Screening report are deemed to be Short-term (Effects lasting one to seven years).

3.2 CUMULATION WITH OTHER EXISTING OR PERMITTED DEVELOPMENT

As part of the assessment of the effects of the proposed development, account has been taken of other existing or permitted development (Appendix A) within the surrounding area that have the potential to combine with the proposed development and result in likely significant cumulative effects. Cumulative effects are the effects arising from the addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.

A preliminary assessment of potential cumulative effects on the environment is facilitated via the Source-Pathway-Receptor (SPR) model which is a multi-step process. The SPR methodology is a tool that ensures the most cautious means of assessment at the preliminary stages of a proposed development. The use of this tool ensures that all possible impacts are identified at a very early stage thus enabling further studies, mitigation measures or ameliorative actions to be put in place. The inherent use of the precautionary principle within the SPR methodology means that all potential for environmental impacts can be identified at a preliminary stage without any need for detailed studies, but rather upon available desktop information.

It is imperative to make clear that not all projects within a study area are capable of combining with the proposed development to result in potential cumulative effects. In order for there to be a potential cumulative effect all three elements of the SPR elements need to be present. If there is no pathway or functional link (direct or indirect) between the proposed development and a receptor, there is no potential for effect. Additionally, if there is no receptor within the area of a potential impact, there is similarly no effect as it does not cause harm to the environment due to the lack of a receptor.

It is acknowledged that projects like the one proposed can have an impact on activity in a larger area that only the Site itself. Generally, the closer to the works, the greater the potential for impacts. The most significant environmental impacts are likely to be confined within 50-150 m of the proposed development. Some effects from the Proposed Development, including air quality and traffic, might have a larger area of effect.

The project being considered, is not expected to have Regional, National or International, or Transboundary impacts. Therefore, a general study area of 500m from the Site location is included; this distance within an urban area is sufficient to capture any permitted development that may give rise to significant cumulative effects.

The National Planning Application Map was consulted for the previous 5 years to identify notable applications (proposed development), or applications granted permission (permitted development) within that period within 500m of the development site. The National Planning Application Map includes planning application data sourced from the 31 individual local authorities across Ireland. This list of consented development is shown in Appendix A at the end of this report.

The search also showed many minor permissions relating to small extensions, agricultural buildings, minor alterations to established developments and various types of commercial developments. These permissions were for established properties

within the vicinity of the development and have been considered as a part of the overall project impact. Given their proximity to the proposed development, scale, and extent the majority of developments in Appendix A are not likely to result in any cumulative effect, with the proposed development. The proposed development is capable of combining with these permitted developments and resulting in cumulative effects. The potential for cumulative effects, in respect of traffic, noise, dust, and biodiversity during the construction and operational phases of the proposed development with these permitted developments, as outlined below, as well as relevant live planning applications, is discussed in further detail in Sections 5.10 of this EIA Screening Report.

The *Ballinasloe Local Area Plan (LAP) 2022-2028* zones the proposed development site as "Residential (Phase 1)" with the objective "to protect, provide and improve residential amenity areas within the lifetime of this plan [2022-2028]". There are multiple key objectives set out in the LAP, these include:

> **BKT1:** Ensure that the developments permitted within the plan area are consistent with the zoned land allocations in the Core Strategy and associated provisions in the Galway County Development Plan 2022 – 2028; and
>
> **BKT4:** To require the preparation and assessment of all planning applications in the plan area to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Ris Assessment Report that accompany this LAP. There shall be a requirement of Ecological Impact Assessment as appropriate in plan area.

The overall aim of the LAP is to support the sustainable development of Ballinasloe which complements the implementation of the Galway County Development Plan 2022-2028.

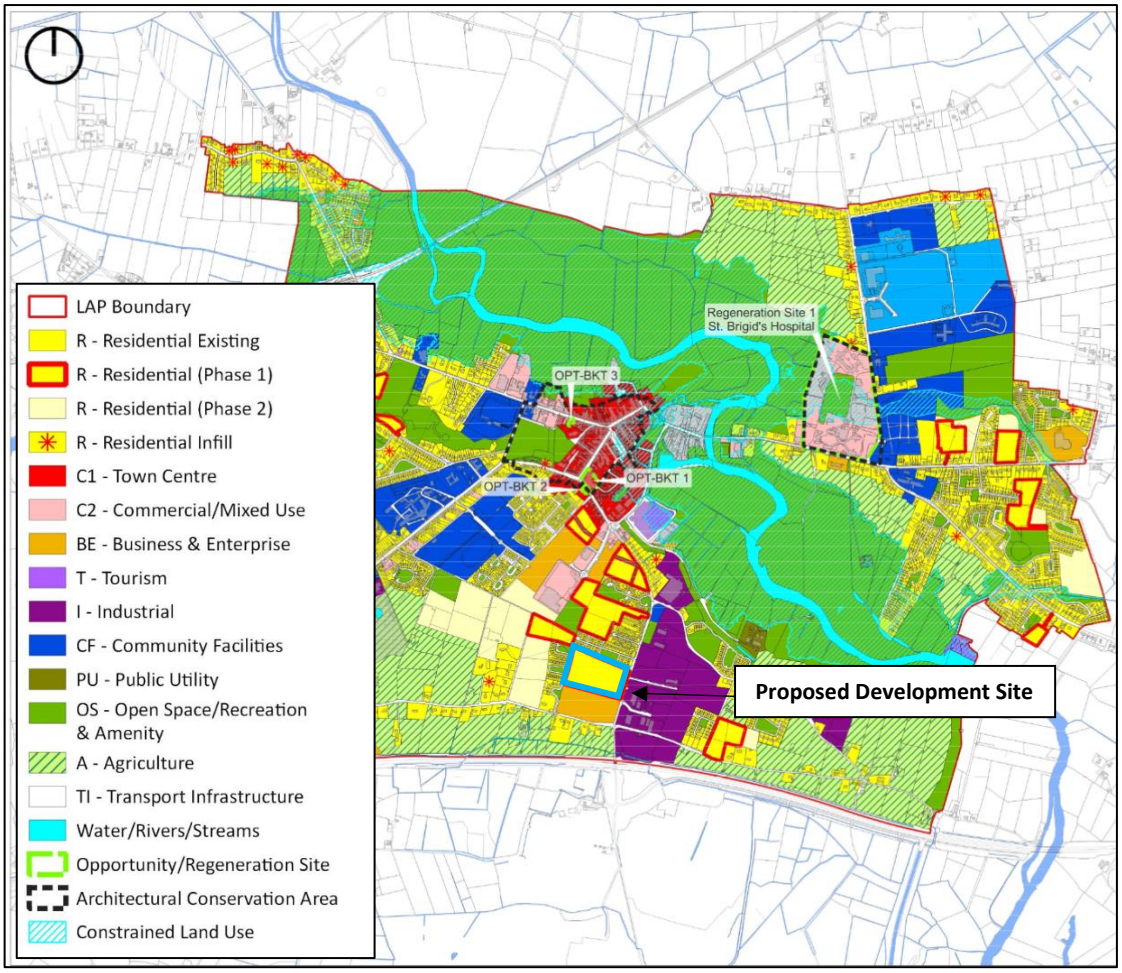

Figure 3-2 *Land Use Zoning Objectives. Proposed Development site indicatively outlined in blue. Source: Ballinasloe Local Area Plan (2022)*

3.3 NATURE OF ANY ASSOCIATED DEMOLITION WORKS

There are no structural demolition works proposed.

3.4 USE OF NATURAL RESOURCES (LAND, SOIL, WATER, BIODIVERSITY)

This section describes the proposed development in terms of the use of natural resources, in particular land, soil, water, and biodiversity. Other resources used will be construction materials which will be typical raw materials used in construction of residential developments. The scale and quantity of the materials used will not be such that would cause concern in relation to significant effects on the environment.

Water Consumption

The construction and operation of the scheme will not use such a quantity of water to cause concern in relation to significant effects on the environment.

During construction of the scheme, water will be required for offices and welfare facilities, this will be provided by tanker. The construction phase will not use such a quantity of water to cause concern in relation to significant effects on the environment.

Once the development is completed and occupied there will be a water demand for domestic usages, i.e. showers, toilets, and kitchen etc. The proposed development requirements have been calculated by DBFL to be 35 m^3/day (12,775 m^3/year). This will be sourced from a newly established groundwater well within the proposed development site. McCloy Consulting Water and Environmental Consultants have prepared a Groundwater Abstraction Feasibility Assessment (Appendix D to the report).

Biodiversity

The potential impact from the proposed development on biodiversity with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive has been considered as a part of the Appropriate Assessment Screening Report (Appendix B) that have been prepared by Moore Group.

Habitats were surveyed on the 30th August 2023 by conducting a study area walkover covering the main ecological areas identified in the desktop assessment. The survey date is at the end of the botanical survey period but is considered adequate given the habitats present on site. A photographic record was made of features of interest.

Signs of mammals such as badgers and otters were searched for while surveying the study area noting any sights, signs or any activity in the vicinity especially along adjacent boundaries.

Birds were surveyed using standard transect methodology and signs were recorded where encountered during the field walkover surveys.

Improved agricultural grassland (GA1) dominates the lands, with patches of dry semi-natural grassland on sloped free-draining areas. A hedgerow (WL1) with several tall trees bounds the site to the west, which is bounded to the north by a housing estate, to the east by the Poolboy Cottages road, and to the south by a light industrial development and open grassland. There is a small wetter area of Marsh (GM1) toward the southeastern end of the site, with wet grassland and willow scrub fringing this area.

No flora or terrestrial fauna species or habitats of national or international conservation importance were noted on site during the survey.

No Third Schedule invasive species, listed in the Habitats and Birds Directives, were noted during the site survey.

The Proposed Development is located within the hydrological catchment area of the Upper Shannon and within the hydrological sub catchment of the River Suck. The River Suck is located 720m northeast of the proposed development site. The River Suck is a designated Special Protection Area (004097). The subject lands do not contain any habitats for which any European sites in the zone of influence have been designated.

3.5 PRODUCTION OF WASTE

Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of

materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g., organic/food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

If material is removed off-site, it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Regulation 27 (By-products) (Previously Article 27 and referred to as Article 27 in this report) of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020, which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

If any soils/stones are imported onto the Site from another construction site as a by-product, this will also be done in accordance with Article 27. Article 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

Operational Phase

The proposed development will give rise to a variety of everyday waste and recycling from the development during the operational phase, i.e., when the project is completed, and fully operational. The typical non-hazardous and hazardous wastes that will be generated at the proposed development will include the following:

- Dry Mixed Recyclables (DMR) - includes wastepaper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from internal plants / flowers;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

In addition to the typical waste materials that will be generated at the development on a daily basis, there will be some additional waste types generated less frequently / in smaller quantities which will need to be managed separately including:

- Green / garden waste may be generated from external landscaping;
- Batteries (both hazardous and non-hazardous);
- WEEE (both hazardous and non-hazardous);
- Printer cartridges / toners;
- Chemicals (paints, adhesives, resins, detergents, etc.);

- Light bulbs;
- Textiles;
- Waste cooking oil (if any generated by the residents);
- Furniture (and, from time to time, other bulky wastes); and
- Abandoned bicycles.

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

Table 3.2 sets out the estimated waste generation for the proposed development for the main waste types.

Table 3.2 *Estimated waste generation for the proposed development for the main waste types.*

Waste type	**Total Volume m^3/Annually**
Organic Waste	55.77
Mixed Dry Recyclables	381.38
Glass	10.79
Mixed Municipal Waste	221.72
Total	669.67

All waste contractors collecting waste from the Site must hold a valid collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO) and waste will only be brought to suitably registered/permitted/licenced facilities. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

These measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 – 2021)* and the draft *National Waste Management Plan for a Circular Economy (2023)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

3.6 POLLUTION AND NUISANCES

There are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater associated with construction activities. The construction activities shall only take place in accordance with standard construction times. No activity, which would reasonably be expected to cause annoyance to residents in the vicinity, will take place outside of these hours. If there is any occasion when work must be complete outside these hours advance notice will be provided to the local authority, businesses and residents in the vicinity.

A CEMP will be prepared by the construction contractor to include the measures set out within this EIA Screening report and accompanying appendices, as well as best practice construction measures for the mitigation and management of air quality control (dust), noise and vibration, surface water runoff, dewatering of excavations,

traffic, spills and leaks and sediment control that will be undertaken during the construction phase. All mitigation measures outlined therein will be implemented.

This CEMP will be maintained by the contractors during the construction phase and covers all potentially polluting activities and emergency response procedures. All personnel working on the Site will be trained in the implementation of the procedures.

3.7 RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

Landslides, Seismic Activity and Volcanic Activity

There have been no recorded landslide events at the Site. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the Site. There is a very low risk of seismic activity to the proposed development site. There are no active volcanoes in Ireland so there is no risk from volcanic activity.

Flooding/Sea Level Rise

A Site-Specific Flood Risk Assessment (FRA) has been conducted by DBFL Consulting Engineers. The potential risk of flooding on the Site was reviewed with regard to incidences of historical, regional and local flooding relevant to the area of the subject site. Flood maps and CFRAM maps provided by Floodinfo.ie were consulted to assess the potential risk of flooding on the site.

The record of historic flood events in the vicinity of the proposed site was extracted from the National Flood Hazard Mapping Website (www.floodmaps.ie). It is observed from OPW Flood Map Report for the Area that there have been no recorded historic flood events on the proposed site.

The review concludes that the development type is classed as a highly vulnerable development defined by *The Planning System and Flood Risk Management – Guidelines for Planning Authorities* and the overall development site is located on lands classified to Flood Zone C (low probability). The latest Flood Zone mapping from OPW floodinfo.ie is shown on Figure 3.2. The proposed site is located c. 720 m from the River Suck and falls outside of the River Sucks' Present Day Flood Extents of 10%, 1% and 0.1% Annual Exceedance Probability. The site is located inland and is not affected by coastal flooding.

The Proposed Development has been designed so that all residential units remain outside any of the Flood Zone designations located on the site and as mentioned above an open green space area has been incorporated to the design. Therefore, avoiding all areas that are at risk of flooding. The Proposed Development is acceptable for this location in accordance with *The Planning System and Flood Risk Management – Guidelines for Planning Authorities.*

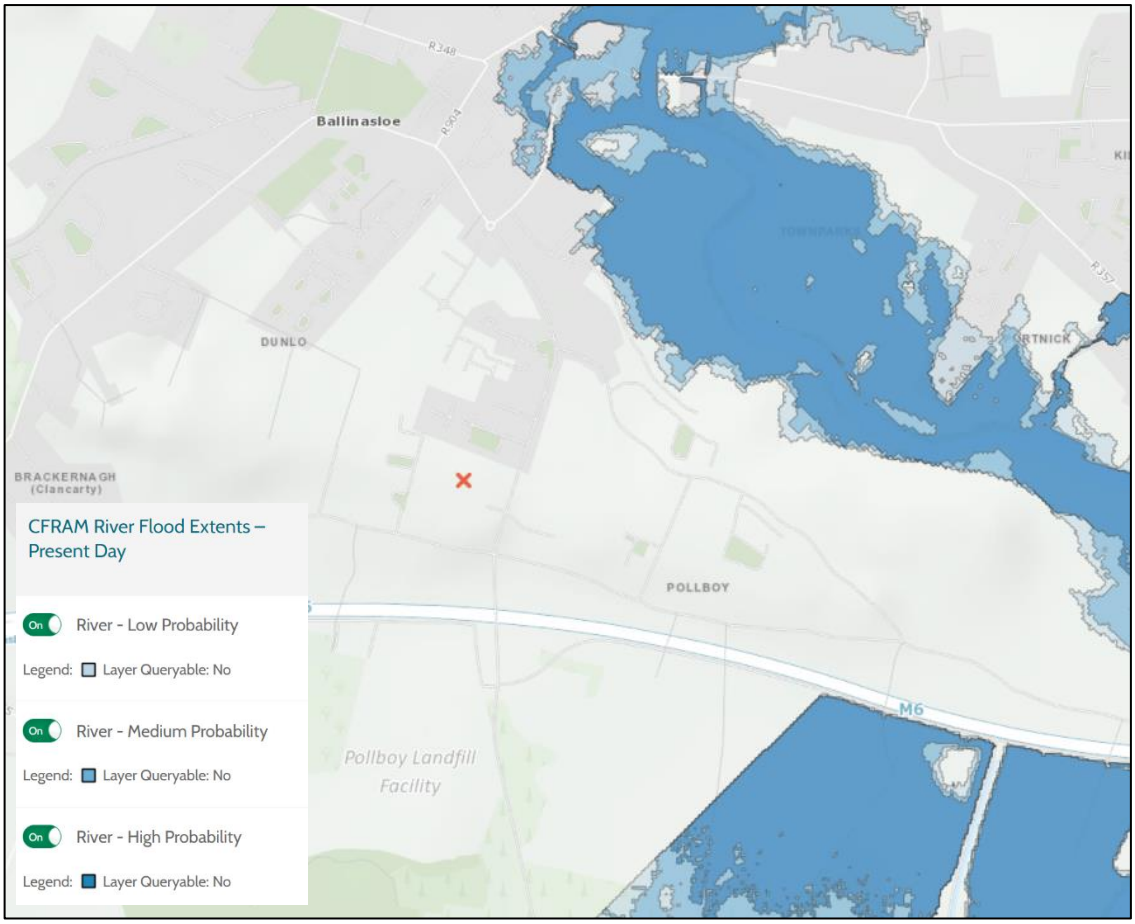

Figure 3-3 *National Indicative Fluvial Flood Extents (Red x indicative of Proposed Development location) (Source: floodinfo.ie)*

Major Accidents/Hazards

The proposed development is not within the consultation distance of any Seveso Site, nor is the proposed development a Seveso/COMAH facility.

The nearest Seveso facility is the Tynagh Energy Ltd Upper Tier Establishment located 19.9 km southwest of the proposed development.

The proposed development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (S.I. 299 of 2007, S.I. 445 of 2012, S.I. 36 of 2016) as amended and associated regulations.

Minor Accidents/Leaks

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction. However, the implementation of the mitigation measures set out in this report (Section 5.0) and the CEMP accompanying the application will ensure that the residual effect on the environment is imperceptible.

3.8 RISKS TO HUMAN HEALTH

The EPA Guidance (2022) explains that the scope of population and human health is project dependant but should consider significant impacts likely to affect aspects such

as: convenience (expanded range of transport options); nuisance/ disturbance from lighting; displaced settlement patterns (residential); employment opportunities; settlement patterns; land use patterns; access for tourism, amenity, health impacts and/or nuisance due to noise, dust or water pollution; and health and safety.

The characteristics of the proposed development, in terms of the risks to human health (for example, due to water contamination or air pollution) have been considered. The primary potential impacts of the proposed development on human health would be the potential for increased air pollution, noise, or pollution of groundwater as a result of the proposed development during the construction phase. Once the proposed development is operational there are potential impacts in respect of visual impact and traffic are also potential but perhaps lesser significant impacts (based on the location and the nature of the proposed development).

The CEMP will include the measures set out within this EIA Screening report and accompanying appendices, as well as best practice construction measures for the mitigation and management for the control of dust generation, traffic and noise, as well as the management of impacts on groundwater during the construction phase. Any impacts associated with construction dust generation, traffic, and noise will be temporary.

The proposed development is small in scale and mass, by way of a considered architectural approach, combined with due regard to the zoning of the Site ("Residential (Phase 1)" – See Figure 3.2), and the surrounding residential properties, will have an insignificant impact on the local landscape amenity.

The area around the proposed development site is serviced by mains water supply, however mains supply cannot provide sufficient water to the site. Therefore, it is proposed that a borewell and associated infrastructure will be established onsite for groundwater abstraction and used as the potable water supply source for the development. The consideration of potential impacts to human health and populations and mitigation measures are outlined in Section 5.1 of this EIA Screening.

There will be no significant negative interaction with local parks. It is not anticipated that the proposed development will have a significant negative interaction with local tourism or shopping amenities.

The proposed development design includes an appropriately designed stormwater network that will ensure that during the operational phase the risk from diesel spills through the carparks is minimised.

Foul wastewater from the proposed development will be of domestic origin and will connect to mains supplies that will be treated off-site. Foul drainage requirements post development have been calculated, indicating an average discharge of 0.3 l/s, and peak discharge of 2.0 l/ s. Consultation has taken place with UÉ to confirm capacity, and Uisce Éireann have confirmed that Ballinasloe WWTP has capacity to deal with the additional demand. The Ballinsloe WWTP AER 2022 confirms that the Peak Hydraulic Capacity at the plant to be be 10,125m^3/day. While the Average Hydraulic Loading to the treatment plant is 3,186 m^3/day and Current Hydraulic Loading – Annual Maximum of 9,500 m^3/day. Assuming the proposed developments runs a foul wastewater peak discharge rate over 24 hours (241.92 m^3/day) while the WWTP is running at its annual maximum the Peak Hydraulic Capacity, this would equate to a new hydraulic capacity – annual maximum of 9,741.92 m^3/day hence the Peak Hydraulic Capacity of the WWTP is not exceeded.

The proposed development does not pose any significant risk to human health, given its nature, scale and location. The potential impacts likely to affect population and human health have been considered in Section 5.1 below.

4.0 LOCATION AND CONTEXT OF THE PROPOSED DEVELOPMENT

4.1 EXISTING AND APPROVED LAND USE

The proposed development site lies to the south of Ballinasloe town centre. The development site is bound to the east and north by residential housing, to the west by Poolboy Cottages road, and several commercial buildings; which include businesses such as An Post Sorting Office, Cooper Leisure, KPW Print management, NCT Centre, and to the south by agricultural land and Western Post Form Limited Furniture Makers.

The site under consideration currently exists as a greenfield area and it is presently vacant agricultural or arable land. The proposed development aims to transform this space into a vibrant residential area with excellent accessibility. Residents and visitors to the development will benefit from a range of public transport options in close proximity to the site.

Moreover, the development's advantageous location offers nearby recreational facilities, ensuring a well-rounded and enjoyable lifestyle for its future residents. Within a radius of less than 2 kilometres from the site, residents will have access to facilities for various indoor and outdoor activities and leisure. The array of recreational options includes the Ballinasloe Town AFC, Ballinasloe and District Tennis Club, Ballinasloe Boxing Club, Ballinasloe Chess Club and Ballinasloe GAA Club.

4.2 RELATIVE ABUNDANCE, AVAILABILITY, QUALITY AND REGENERATIVE CAPACITY OF NATURAL RESOURCES IN THE AREA AND ITS UNDERGROUND

4.2.1 Hydrogeology

The GSI (2023) National Bedrock Aquifer Map, the GSI classifies the bedrock aquifer beneath the subject site as a ‘Regionally Important Aquifer – Karstified (conduit)’, which is productive in regional zones. The aquifer is further described as an aquifer in which the degree of karstification determines the potential to develop groundwater. The proposed development is within the ‘Suck South’ groundwater body (EPA Code: IE_SH_G_225) (Figure 4.1). The most recent WFD groundwater status for this water body (2016-2021) is ‘Good’ with a current WFD risk score ‘Not at risk’.

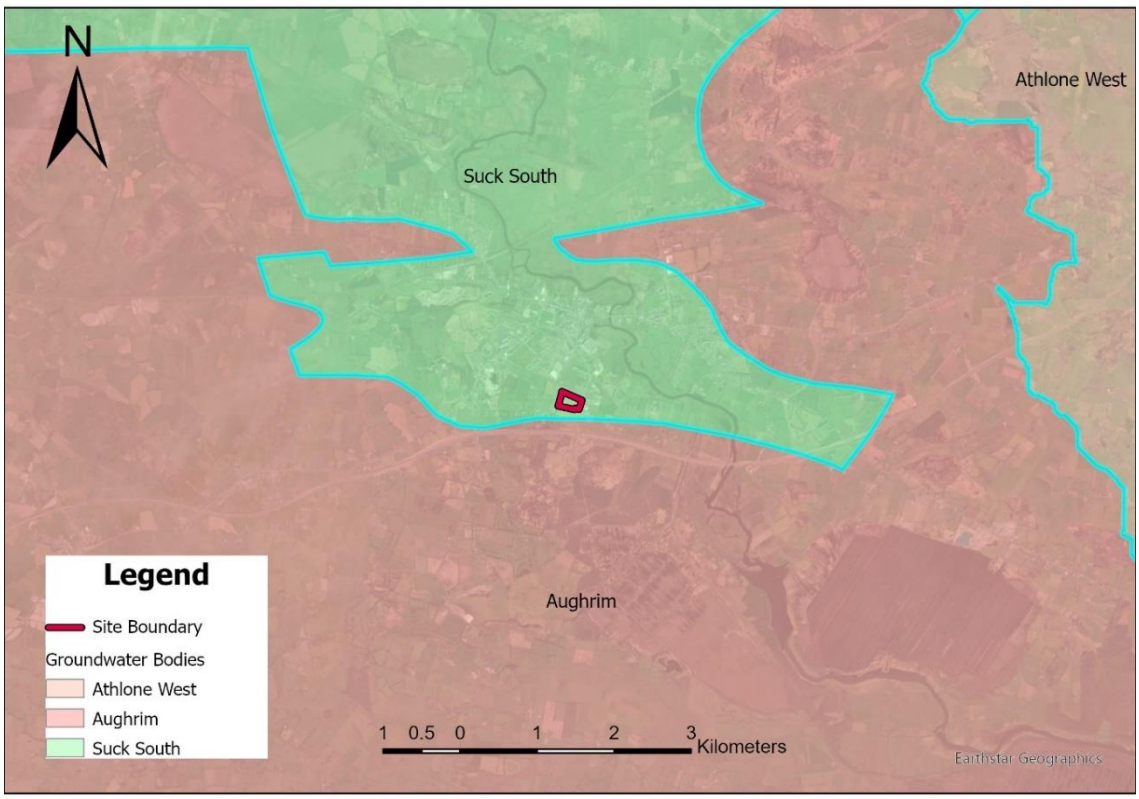

Figure 4-1 WFD Groundwater Bodies

The groundwater vulnerability beneath the site is subdivided into different vulnerability classifications. The majority of the site is in a High vulnerability area. The northwestern boundary of the site is extreme vulnerability area, and then in the northeastern corner of the site is a Moderate vulnerability area. The groundwater vulnerability indicates that the depth to bedrock is >10m below the surface.

The Groundwater Abstraction Feasibility Assessment (McCloy Consulting, 2023) (Appendix D) states the bedrock beneath the site could be a variety of different formations, namely Waulsortian Limestones or Visean Karstified Limestones. The Groundwater Abstraction Feasibility Assessment contains details on the hydraulic properties of the underlying bedrock (Section 3.2.8) as well as the indicative groundwater potential (Section 3.3). With relation to yield from the two types on underlying bedrock, it is understood that the typical yields of Visean Karstified Limestones can range from 225 - 400m^3 /day and typical yields from the Waulsortian Limestones can range from 12.5 – 125 m^3 /hr, with a typical yield of c.42 m^3 /hr. Two nearby wells located within the Visean/Waulsortian/Lucan Limestones give yields of 49.1m^3 /day and 152.6m^3 /day at relatively shallow depths at 33.8m and 22.9m, respectfully.

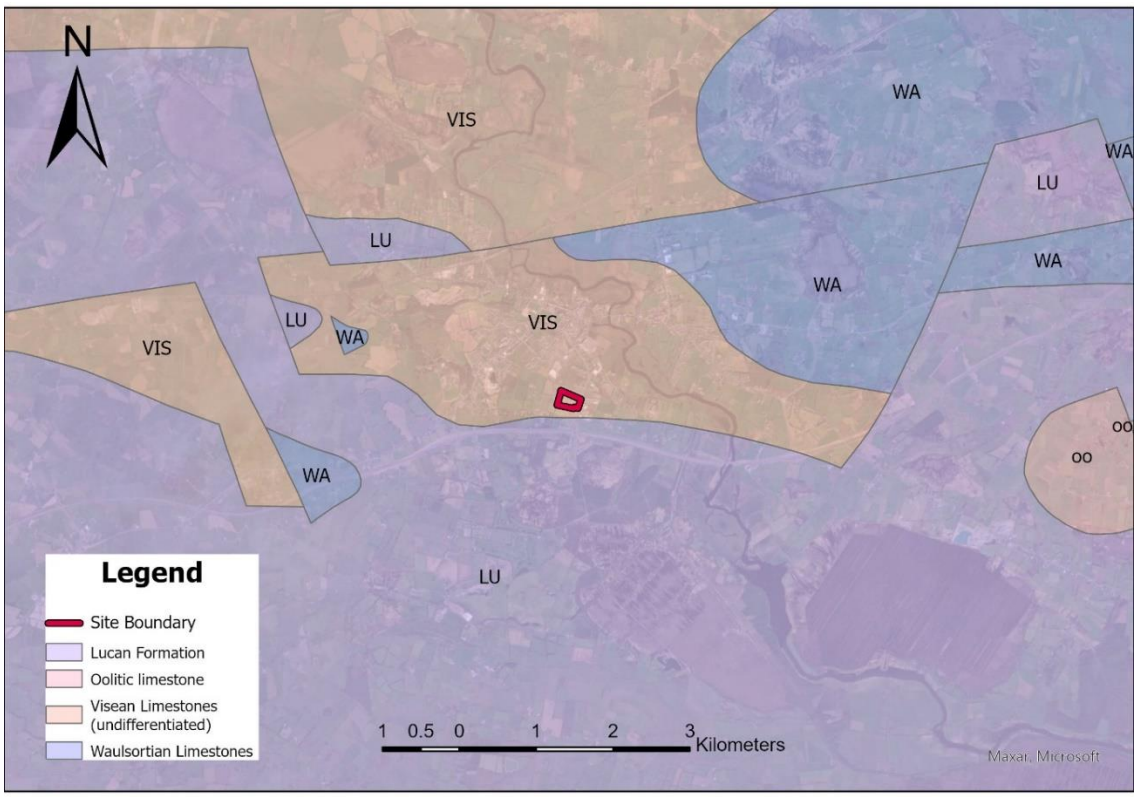

Figure 4-2 Bedrock Geology

Mapping from the Geological Society of Ireland (GSI, 2022) indicates the bedrock underlying the site is part of the Visean Limestones (undifferentiated) Formation (code CDVIS) and made up of Undifferentiated Limestone see Figure 4.2.

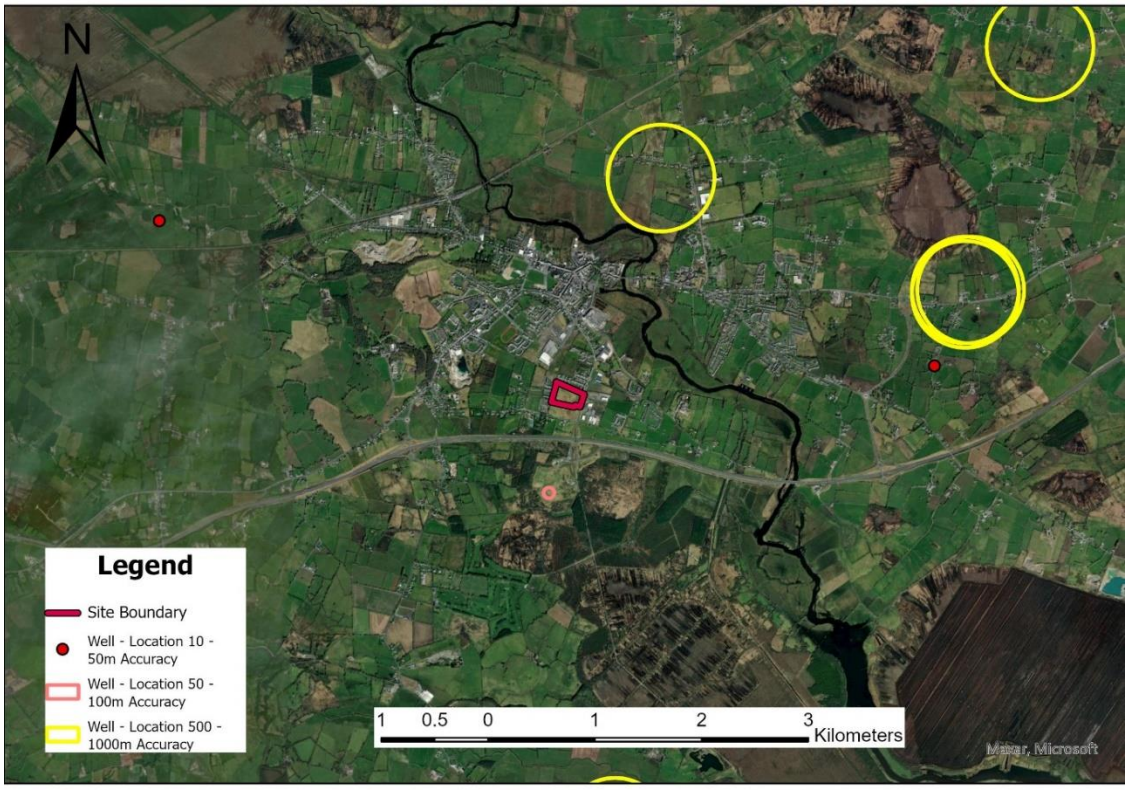

Figure 4-3 GSI Well Card Index Map

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. This current index does not show any wells drilled or springs within the Site boundary, there are a number of wells recorded in the in the general area with the following ID's 1721NEW013, 1723SWW003, 1723SEW039, 1723SEW007, 1723SEW005 and 1723SEW006 (See Figure 4.3).

The Groundwater Abstraction Feasibility Assessment prepared by McCloy Consulting indicates that the nearest borewell is 550 m northeast of the development. The groundwater well / borehole is in use by Uisce Éireann for wastewater treatment purposes. The site is not located near any recorded public groundwater supplies or group schemes. There are no recorded groundwater source protection zones in the immediate vicinity of the Site. There are no sensitive soil receptors, no identified areas of geological heritage or recorded groundwater supplies in the vicinity of the Site boundary. The area is serviced by Local Authority mains therefore it is unlikely that any wells are used for potable supply.

The Ballinasloe Civic Amenity Centre, previously the Pollboy Landfill, is located c. 450m south of the proposed development site shown in Figure 4.4 below. The landfill site is currently operated under Waste License W0027-02, and landfilling ceased at this location on 31st December 2005. The entire landfill covers an area of c. 23 ha.

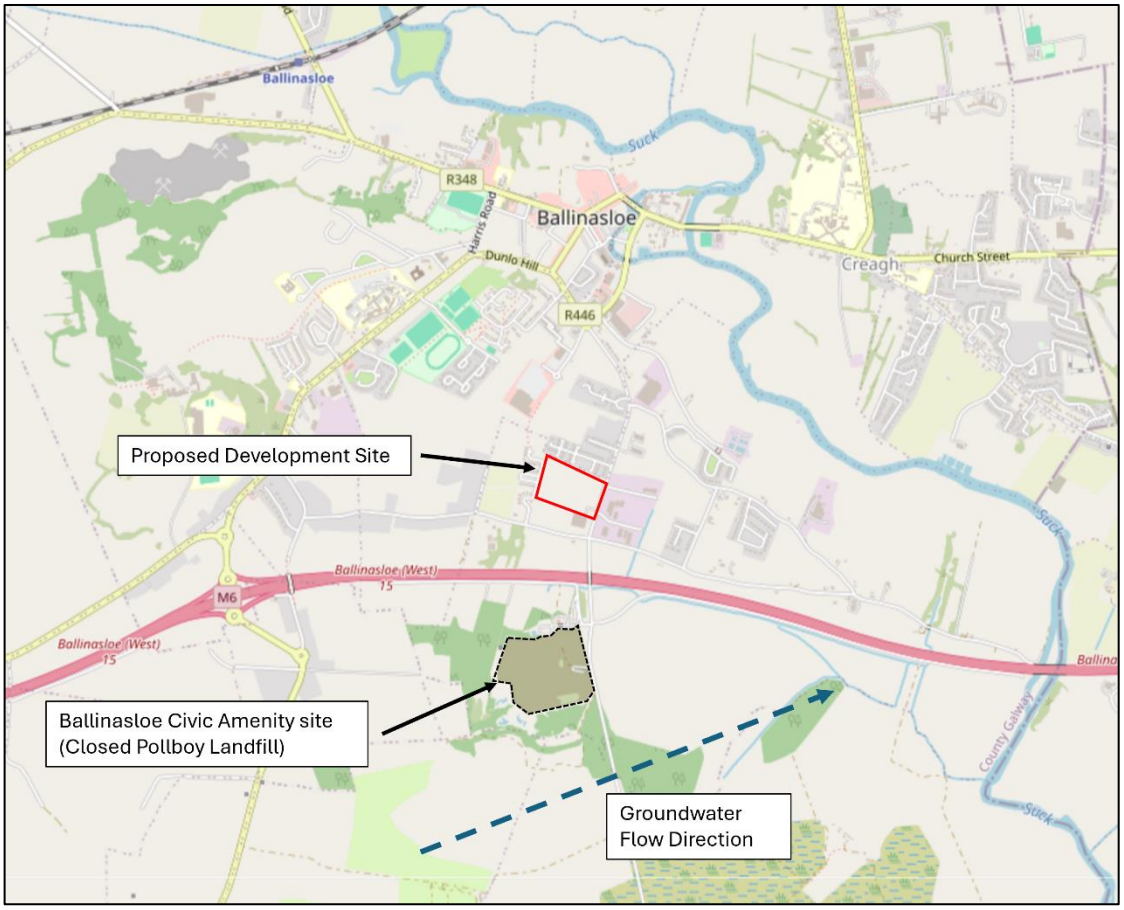

Figure 4-4 Location of Ballinasloe Civic Amenity Centre (previously former Landfill).

McCloy Consulting have produced a Synopsis Note (McCloy Consulting, 2023a) (Appendix E) which reviewed reports prepared by RPS Group in relation to the Pollboy Landfill. These reports are:

- ‘Pollboy Landfill – Hydrogeological Assessment’, RPS Group, 2013;
- ‘Pollboy Landfill – Request for Further Information’, RPS Group, Sept 2015;
- ‘Pollboy Landfill – Response to Query on Submission LR015480’, RPS Group, July 2015.

McCloy Consulting concluded that the proposed development site is considered to be naturally upgradient of the Pollboy Landfill, and therefore it is not considered that the landfill will impact the proposed development site via surface water flow or topographically.

As the abstraction well at the Pollboy Site is drilled to 150mbgl, with casing to 9mbgl and plain pipe installed to 25mbgl grouted into place, and therefore, groundwater is only entering the abstraction well system from below 25mbgl. As a result, it is considered unlikely that the well is fed from the upper 15m of the bedrock aquifer, and it is more likely the well is fed via fracture flow deep within the bedrock aquifer. Additionally, as the Pollboy Landfill exhibits low permeability overburden deposits, coupled with the evidence of short groundwater flow paths, it is considered highly unlikely that the landfill is affecting the Pollboy Site.

McCloy Consulting (Appendix E) have confirmed that Pollboy Landfill groundwater flow direction was confirmed to be in a northeasterly/easterly direction towards the river Suck (Figure 4.4) , and therefore not flowing in the direction of the proposed development site (north) and so it is considered to be not hydraulically connected to the site/abstraction well. Thus, there is no potential for interaction (hydrogeological connectivity) between the Pollboy Landfill and the groundwater abstraction on site.

The consideration of potential impacts to hydrogeology and any mitigation measures are outlined in Section 5.2 of this EIA Screening.

4.2.2 Hydrology

The proposed development site lies within the Upper Shannon catchment area (Catchment ID: 26D). The site is split into two sub-catchments with the northwestern portion located within the Suck_SC_080 subcatchment (Subcatchment ID: 26D_2) and the southeastern potion located within the Suck_SC_100 subcatchment (Subcatchment ID: 26D_3) (EPA, 2023).

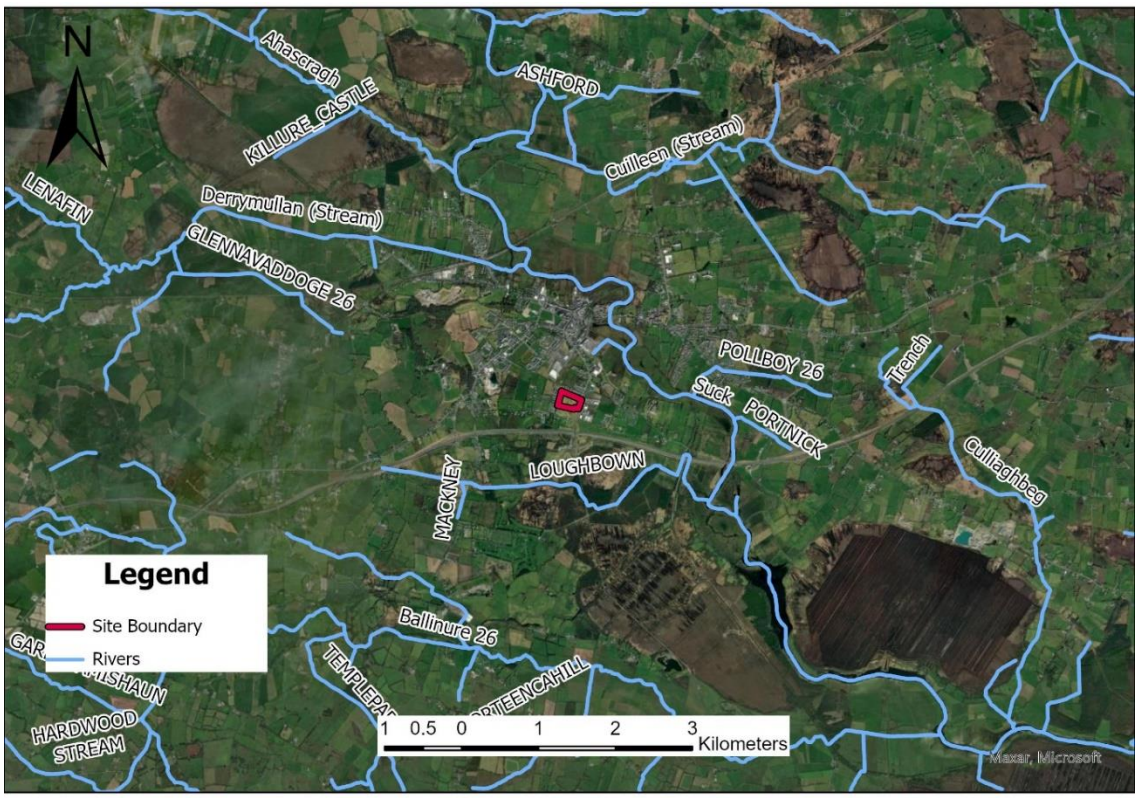

Figure 4-5 Regional Hydrology (Source: EPA Rivers)

The closest named surface water feature to the proposed development is the River Suck to the northeast (Figure 4.4). The River Suck flows southeast for c. 14 km before discharging into the River Shannon.

The Environmental Protection Agency (EPA, 2023) on-line mapping presents the available water quality status information for water bodies in Ireland. The River Suck has a 2016-2021 WFD status of 'Moderate' (EPA, 2023). The nearest downstream Water quality monitoring station to the proposed development is '3 km d/s Ballinasloe (Pollboy)' Station located c. 2 km downstream from the development site (Station ID: RS26S071400).

4.2.3 Biodiversity and Areas of Conservation

The potential impact from the proposed development on biodiversity with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive has been considered as a part of the AA Screening Report (Appendix B) that have been prepared by Moore Group.

Improved agricultural grassland predominates with patches of dry semi-natural grassland on sloped free draining areas. A hedgerow with several tall trees bounds the site to the west, which is bounded to the north by a housing estate, to the east by the Pollboy Road, and to the south by a light industrial development and open grassland. There is a small wetter area of Marsh toward the southeastern end of the site, with wet grassland and willow scrub fringing this area.

No flora or terrestrial fauna species or habitats of national or international conservation importance were noted on site during the survey.

There were no invasive species recorded at the proposed development site.

The nearest European site is the River Suck Callows SPA (Site Code 004097) which lies 0.65 km to the northeast of the proposed development site. Moore Group has provided an outline of the confirmed and likely potential ecological features identified within the subject lands at the site. It has been objectively concluded by Moore Group Environmental Services that:

1. The Proposed Development is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
2. The Proposed Development is not likely to either directly or indirectly significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
3. The Proposed Development, either alone or in combination with other plans or projects, is not likely to have significant effects on a European site.
4. It is possible to conclude that significant effects can be excluded at the screening stage.

It can be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on any European site, in the absence of any mitigation. An appropriate assessment is not, therefore, required.

4.3 ABSORPTION CAPACITY OF THE NATURAL ENVIRONMENT

The proposed development due to its size and localised nature will not have any significant negative effect on wetlands, riparian areas, river mouths, coastal zones and the marine environment, mountain and forest areas, nature reserves and parks, or densely populated areas.

EPA maps (https://gis.epa.ie/EPAMaps/default) confirm that the development site is not located within or adjoining an Architectural or General Conservation Area; is not located within or adjoining a Native Woodland Trust; and is not covered by protected views, scenic routes or viewpoints.

5.0 TYPES AND CHARACTERISTICS OF POTENTIAL IMPACTS

This section sets out the likely significant effects on the environment of proposed development in relation to criteria set out under paragraphs 1 and 2 (as set out in Sections 4 and 5 above), with regard to the impact of the project on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment report' in Section 171A of the Act (as amended).

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA 2022) this criteria is duplicated in Table 5.1.

Table 5.1 *Schedule of Impacts following EPA Guidelines*

Characteristic	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse	A change which reduces the quality of the environment

Describing the Significance of Effects	Imperceptible	An effect capable of measurement but without significant consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
	Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
	Significant Effects	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects	An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects	Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration
	Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the Type of Effects	Indirect Effects (a.k.a secondary or Off-site effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing Effects	The environment as it would be in the future should the subject project not be carried out
	`Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable Effects	When the full consequences of a change in the environment cannot be described
	Irreversible Effects	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect

	Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of Sox and Nox to produce smog)

5.1 POPULATION AND HUMAN HEALTH

5.1.1 Construction phase

The potential impacts of the proposed development on population human health and populations would be nuisances such as increased air pollution (dust), noise, traffic, and visual impact of the construction phase.

There is no significant risk of pollution of soil, groundwater or watercourses associated with the proposed development.

The construction phase of the proposed development will provide for the temporary employment of construction workers which will provide benefits for local businesses providing retail or other services to construction workers and potential additional employment in the area.

The likely potential impact of the proposed development with respect to population and human health during the construction phase in the absence of mitigation can be considered to be ***negative, moderate,*** and ***temporary.***

The construction contractor will develop a CEMP that will implement the mitigation measures set out in this report; in the form of requirements and standards in relation to construction noise, traffic, and dust generation that must be met during the construction phase. All mitigation measures outlined therein will be implemented. The development will be undertaken in accordance with current European and British industrial standards, with all mitigation and safety measures put in place to ensure a responsibly managed construction process.

The residual impact of the proposed development with respect to population human health during the construction phase after the implementation of mitigation measures set out in this report, is ***negative***, ***not significant***, and ***temporary***.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of population and human health impacts during the construction phase. Therefore, a requirement for subthreshold EIA does not arise.

5.1.2 Operational Phase

The residential development will generate no emissions to air, ensuring a negligible impact on air quality and maintaining a healthy living environment for both residents and surrounding communities, see Section 5.5 for further detail. Noise can have adverse effects on human health, including stress, sleep disturbance, and even more severe issues like hearing loss if exposure is prolonged and excessive. The sources of noise of the proposed residential units are inherently low, will not generate significant noise that may affect human health or populations beyond the site boundaries.

Additionally, there are no planned direct discharges to water or land; however, measures are proposed to prevent accidental discharge to surface water during the operational phase (as detailed in Section 5.2). The design of the proposed development takes into account the sensitivity of the surroundings, ensuring that it will

not adversely impact local populations. Landscape and visual impacts are also considered (see Section 5.6).

The proposed development requires the abstraction of groundwater to provide a potable water supply for residents. However, there is no potential for significant impacts to populations and human health during the abstraction and use of groundwater, given that:

- This abstracted groundwater will be appropriately treated onsite to ensure compliance with the European Union (Drinking Water) Regulations 2023.
- The abstraction will be registered with the EPA in accordance with the European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261 of 2018).
- Any further requirements of the Local Authority, Health Service Executive (HSE) will be met.
- McCloy Consulting (Appendix E) concluded that the proposed development site is considered to be naturally upgradient of the Pollboy Landfill, and therefore it is not considered that the landfill will impact the proposed development site via surface water flow or topographically.
- McCloy Consulting (Appendix E) have confirmed that the abstraction well at the Pollboy Site is drilled to 150mbgl, with casing to 9mbgl and plain pipe installed to 25mbgl grouted into place, and therefore, groundwater is only entering the abstraction well system from below 25mbgl. As a result, it is considered unlikely that the well is fed from the upper 15m of the bedrock aquifer, and it is more likely the well is fed via fracture flow deep within the bedrock aquifer. Additionally, as the Pollboy Landfill exhibits low permeability overburden deposits, coupled with the evidence of short groundwater flow paths, it is considered highly unlikely that the landfill is affecting the Pollboy Site.
- McCloy Consulting (Appendix E) have confirmed that Pollboy Landfill groundwater flow direction was confirmed to be in a northeasterly/easterly direction towards the river Suck (Figure 4.4) , and therefore not flowing in the direction of the proposed development site (north) and so it is considered to be not hydraulically connected to the site/abstraction well. Thus, there is no potential for interaction (hydrogeological connectivity) between the Pollboy Landfill and the groundwater abstraction on site.

The residual impact of the proposed development with respect to populations and human health during the operational phase is ***positive***, ***not significant*** and ***short-term***.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of population and human health impacts during the operational phase. Therefore, a requirement for subthreshold EIA does not arise.

5.2 LAND, SOILS, GEOLOGY, HYDROGEOLOGY, HYDROLOGY

5.2.1 Construction Phase

Establishment of water supply source

It is proposed that a borewell for groundwater abstraction is established on the site to serve as the primary water supply source. During the construction phase this will

necessitate the use of specialist equipment to drill to the required depth to access the aquifer below the site.

The sites groundwater vulnerability is primary classified as 'High' with small regions in the northwest and northeast classified as 'Extreme' and 'Moderate', respectively. During the drilling of a borewell, a direct pathway from surface to groundwater is established. Sources of contamination, such as drilling fluids and additives, and adjacent contamination sources, may find a pathway to groundwater due to poor construction practices and faulty well construction (e.g. via inadequate casing sealing or insufficient grouting). The potential impact is contamination of groundwater which may impact the underlying aquifer if not adequately mitigated against.

Best practice measures as part of the site CEMP will be put in place by the drilling contractor to ensure there are no negative impacts on the underlying soil, groundwater and aquifer. Additionally, prior to drilling of the well to be used as the primary water supply source the following measures will be taken:

- The construction and installation of a trial borewell for the purposes of performing pumping tests to determine the composition and potential productivity of the underlying bedrock.
- Crude airlifts tests should be carried out at regular intervals during drilling to develop a picture of how yield changes with depth, and depths of significant water bearing geological features.
- Long term pumping tests should be carried out by a qualified Hydrogeologist to confirm water quantity and water quality.

In respect of the foregoing, the residual impact as a result of the establishment of a borewell on site, on land, soils, geology, hydrogeology, and hydrology during construction phase is considered to be ***negative, imperceptible*** and ***temporary***.

Potential for increased sediment and runoff from excavation, soil handling, removal and compaction

Land clearing, earthworks and excavations will be required construction phase operations to facilitate site clearance, construction of new buildings, foundations and installation of services. This will include site levelling, construction, and building foundation excavation, and will necessitate the removal of vegetation cover and the excavation of soil and subsoils.

The gradual introduction of impermeable surfaces and the compaction of soils across the construction site will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading, which could potentially impact local drainage if not adequately mitigated.

Movement of material will be minimised to reduce the degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. Soil from works will be stored away from existing drainage features to avoid any potential impact.

The site preparation, excavations and levelling works required to facilitate construction of foundations, access roads and the installation of services will require excavation of soil, stones, made ground and bedrock (if encountered). Excavated soil will arise during the construction period and will be stored (if required) on site prior to being

removed by a specialist contractor. Any material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.

Stockpiles of soil and construction aggregate can have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction.

In respect of the foregoing, the residual impact as a result of the potential for increased sediment and runoff from excavation works on, land, soils, geology, hydrogeology, and hydrology during construction phase is considered to be ***negative, imperceptible*** and ***temporary***.

Potential for contamination from Accidental Spills and Leaks

There is potential for water (rainfall and/or discontinuous perched groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to water quality for the duration of the construction if contaminated water is allowed percolate to the aquifer or accidental discharges into surface water.

Machinery activities on site during the construction phase may result in run off of contaminated waters into surface water networks or ground water. Potential impacts could arise from accidental spillage of fuels, oils, paints, cement, etc. which could impact surface water if allowed to runoff into surface water systems and/or receiving watercourses or groundwaters.

The potential impacts during the construction phase are required to be mitigated by ensuring best practice construction with respect to storage of any hazardous substances (fuels, chemicals and other construction materials that may pose a risk to the environment). A Construction Environmental Management Plan (CEMP) will be prepared by the construction contractor that will outline theses measures.

In respect of the foregoing, the residual impact in respect of the potential for impacts related to contamination from accidental spills on, soils, geology, hydrogeology, and hydrology during construction phase is considered to be ***negative, imperceptible*** and ***temporary.***

Dewatering, Run-off and Sediment Loading

There is the potential for contaminated surface water run-off from site preparation, levelling, landscape contouring and excavations during the construction phase may contain increased silt levels or become polluted from construction activities. Silt water can arise from excavations, exposed ground, stockpiles, and access roads.

Construction water containing large amounts of silt or other contaminants such as hydrocarbons has the potential to cause negative, and short-term impacts receiving surface water bodies, or surface water networks, if not adequately mitigated.

A Construction Environmental Management Plan (CEMP) will be prepared by the construction contractor. This CEMP will ensure that management of surface water during construction does not lead to contamination as a result of construction activities including as a result of:

- Suspended solids: arising from ground disturbance and excavation;
- Hydrocarbons: accidental spillage from construction plant and storage depots;
- Faecal Coliforms: contamination from coliforms can arise if there is inadequate containment and treatment of onsite toilet and washing facilities; and
- Concrete /cementitious products: arising from construction materials.

Where dewatering is required during the construction phase, dirty water will be fully and appropriately attenuated being appropriately discharged. No silty or contaminated water from the construction works will be discharged to any stormwater network.

During the construction phase there are no direct or indirect source pathway linkage between the proposed development and any European Sites.

In line with good practice, appropriate and effective mitigation measures will be included in the construction design, management of construction programme and during the operational phase of the proposed development. With regard the construction phase, adequate mitigation measures are incorporated in the CEMP. these specific measures will provide protection to the receiving soil and water environments.

In respect of the foregoing, the residual impact in respect of the potential for impacts related to dewatering on, soils, geology, hydrogeology, and hydrology during construction phase is considered to be ***negative, imperceptible*** and ***temporary.***

Foul Water During Construction

Welfare facilities will be provided for the contractors on site during the construction works. During construction, portable sanitary facilities will be provided with waste collected and disposed of appropriately. There are no predicted adverse impacts on wastewater during construction.

No silty or contaminated water from the construction works will be discharged to any stormwater network but should any discharge of contaminated construction water be required during the construction phase; the discharge of contaminated construction water will be to foul sewer on Poolboy Cottages road following agreement with Uisce Éireann.

With due consideration to the characteristics of the proposed development and the Site location, there are no likely potential significant impacts of the proposed development in relation to foul water during construction, under the environmental factor of land, soils, geology, hydrogeology, and hydrology.

Conclusions

Having regard to the foregoing, there is no real likelihood of significant effects on the environment arising from the proposed development in respect of land, soils, geology,

hydrogeology and hydrology impacts during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.2.2 Operational Phase

Storm Wastewater Discharges

The design of the stormwater drainage network for the proposed development has taken cognisance of the guidelines and requirements set out by the Galway County Council (GCC) Drainage Division, which requires all new developments to incorporate the principles of Sustainable Urban Drainage Systems (SuDS).

Surface water from the operational development will discharge to the drainage location at the southeast corner of the site on Pollboy Cottages road. Surface water runoff from the site's internal road network will be directed to bioswales before entering the surface water network for the site. A hydrobrake to restrict run-off rate to the greenfield rate of 10.8 l/s and petrol interceptor are proposed prior to the surface water outfall.

Once stormwater has left the site it will travel c. 270m south along the existing stormwater network. It then outfalls to an existing drainage ditch immediately adjacent the M6 motorway. The ditch ultimately drains to the River Suck Callows SPA 2km to the east. The implementation of the SUDS is best practice stormwater management system and not relied upon for the protection of downstream European sites.

The surface water from the Site will ultimately discharge to the land drain to the north of the site via proposed SUDS measures. The residual impact on land, soils, geology, hydrogeology, and hydrology during operation is considered to be ***neutral, imperceptible*** and ***short-term.***

Foul Wastewater Discharges

Foul wastewater from the proposed development will be of domestic origin and will connect to mains supplies that will be treated off-site at Ballinasloe Wastewater Treatment Plant (WWTP). Foul drainage requirements post development have been calculated by DBFL Consulting Engineers as average is a discharge of 0.3 l/s, and post development peak discharge of 2.0 l/s.

The proposed development design includes an appropriately designed stormwater network that will ensure that during the operational phase the risk from diesel spills through the carparking spaces is minimised.

The residual impact on land, soils, geology, hydrogeology, and hydrology during operation is considered to be ***neutral, imperceptible*** and ***short-term.***

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of land, soils, geology, hydrogeology, and hydrology during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

Abstraction of Groundwater

The proposed development requires the abstraction of groundwater to provide a potable water supply for residents. However, there is no potential for significant impacts to populations and human health during the abstraction and use of groundwater, given that:

- This abstracted groundwater will be appropriately treated onsite to ensure compliance with the European Union (Drinking Water) Regulations 2023.
- The abstraction will be registered with the EPA in accordance with the European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261 of 2018).
- Any further requirements of the Local Authority, Health Service Executive (HSE) will be met.
- McCloy Consulting (Appendix E) concluded that the proposed development site is considered to be naturally upgradient of the Pollboy Landfill, and therefore it is not considered that the landfill will impact the proposed development site via surface water flow or topographically.
- McCloy Consulting (Appendix E) have confirmed that the abstraction well at the Pollboy Site is drilled to 150mbgl, with casing to 9mbgl and plain pipe installed to 25mbgl grouted into place, and therefore, groundwater is only entering the abstraction well system from below 25mbgl. As a result, it is considered unlikely that the well is fed from the upper 15m of the bedrock aquifer, and it is more likely the well is fed via fracture flow deep within the bedrock aquifer. Additionally, as the Pollboy Landfill exhibits low permeability overburden deposits, coupled with the evidence of short groundwater flow paths, it is considered highly unlikely that the landfill is affecting the Pollboy Site.
- McCloy Consulting (Appendix E) have confirmed that Pollboy Landfill groundwater flow direction was confirmed to be in a northeasterly/easterly direction, and therefore not flowing in the direction of the site (north) and so it is considered to be not hydraulically connected to the site/abstraction well.

The proposed development requirements have been calculated by DBFL to be 35 m^3/day (12,775 m^3/year). The Groundwater Abstraction Feasibility Assessment (McCloy Consulting, 2023) (Appendix D) the typical yields of can range from 225 - 400m^3 /day, Two nearby wells located within the Visean/Waulsortian/Lucan Limestones give yields of 49.1m^3 /day and 152.6m^3 /day at relatively shallow depths at 33.8m and 22.9m, respectfully. The volume to be abstracted on site, at the depth proposed, will not have a significant impact on underlying groundwater resources.

The residual impact on hydrogeology, and the WFD Status of the Suck South groundwater body during operation is considered to be ***neutral, imperceptible*** and ***long-term.***

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of land, soils, geology, hydrogeology, and hydrology during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.3 BIODIVERSITY

5.3.1 Construction Phase

The potential impact from the proposed development on biodiversity with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive has been considered as a part of the AA Screening Report (Appendix B) that have been prepared by Moore Group.

During the site survey conducted on the 30th August 2023, any ecological features of particular significance present within the potential Zone of Influence of the Proposed Development were noted, such as primarily designated habitats and species, including

habitats/species listed in Annex I, II and IV of the EU Habitats Directive, rare flora listed in the Flora Protection Order along with other semi-natural habitats of conservational value.

No flora or terrestrial fauna species or habitats of national or international conservation importance were noted on site during the survey.

No Third Schedule invasive species, listed in the Habitats and Birds Directives, were noted during the site survey.

The Proposed Development site is not located adjacent or within a European site, therefore there is no risk of habitat loss or fragmentation or any effects on QI habitats or species directly or ex-situ. The River Suck Callows SPA (Site code 004097) lies c. 0.65 km northeast of the subject lands where it is associated with the River Suck. There are no significant effects predicted from the proposed development on habitats, flora, fauna or biodiversity.

The measures associated with the construction phase required to avoid or reduce any potential harmful effects on biodiversity are set out below These measures are not included as mitigation to protect European Sites. The Site manager shall ensure that all personnel working on-site are trained and aware of the mitigation measures detailed below:

- If protected or notable species are encountered during operations at the Site the ECoW or NPWS will be contacted for advice.
- Trees that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree (2m) so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist.
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it;
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines.
- Ideally and where feasible, vegetation (*e.g.,* hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests may be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

As described in Section 5.2.1 once the Proposed Development is not directly connected with, or necessary to the conservation management of any European sites in the Zone of Influence as defined within the AA Screening prepared by the Moore group (2023).

Based on the foregoing, and with regard to the evidence set out within the AA Screening Report, the potential effects on local biodiversity and ecology are ***neutral, imperceptible***, and ***temporary*** for the construction phase.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of biodiversity during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.3.2 Operational Phase

The proposed development will result in small areas of habitat loss within the proposed development boundary. Considering the relatively small areas of habitat lost and the proposed retention of trees and proposed rear garden spaces, this will not be significant at any geographic scale.

The relevant mitigation measures which will be incorporated and adhered to during the operational phase of the proposed development include:

- Any light spill affecting habitats outside of the proposed development boundary will be minimised as far as is practically possible. Public lighting design in circulation and car parking areas will be designed in accordance with EN13201-2 and Local Authority requirements. Light overspill will be minimised using appropriate siting, column height and choice of luminaires.
- The proposed landscape design will ensure that the biodiversity value of the habitats to be retained and created as part of the proposed development are maximised in order to compensate for any habitat loss.

As described in Section 5.2.2 once the proposed development is operational, there will be an indirect hydrological pathway to the River Suck Callows SPA via the stormwater network. The implementation of the SUDS is best practice stormwater management system and not relied upon for the protection of downstream European sites.

Based on the above and with regard to the evidence set out within the AA Screening Report, the potential effects on local biodiversity and ecology are ***neutral, slight***, and ***short-term*** for the operational phase.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of biodiversity during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.4 AIR QUALITY AND CLIMATE

5.4.1 Construction Phase

Construction stage traffic is expected to be the dominant source of greenhouse gas emissions because of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO_2 and N_2O emissions. However, due to short-term nature of these works, the impact on climate will be ***not significant***, and ***temporary***.

Nevertheless, some site-specific mitigation measures will be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the Site.

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust and PM10/PM2.5 emissions. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m based on Transport Infrastructure Ireland (TII) guidance (2011).

The scheme has potential for dust impacts during construction due to the separation distance between the Site and the nearest sensitive receptors. The key sensitive receptors are the residential properties immediately adjacent the northern and western boundaries of the proposed development site. Therefore, during construction, there is potential for dust impacts on these sensitive receptors which would be considered in the absence of mitigation ***negative, moderate*** and ***temporary.***

In summary the measures which will be implemented will include:

- A speed restriction of 20 km/hr shall be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads.
- Construction access to the Site will be directly from Poolboy Cottages road to the east of the Site.
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- During periods of very high winds (gales), construction activities likely to generate significant dust emissions should be postponed until the gale has subsided.
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the Site. Where possible storage piles should be located downwind of sensitive receptors
- Where feasible, hoarding will be erected around site boundaries. This will have the benefit of reducing the impact of larger particles on nearby sensitive receptors.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities such as rock blasting or earthworks are necessary during dry or windy periods.
- Vehicles exiting the Site will be adequately inspected and will make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times when practicable to restrict the escape of dust.
- Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the Site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

During construction, the proposed development will give rise to dust in the short term. Mitigation measures proposed in the accompanying CEMP will ensure dust

suppression techniques so as to remain within acceptable levels. These include road sweeping, wheel washing and covered vehicles.

The residual effects on air quality and climate will be ***negative, slight,*** and ***temporary*** during the construction phase.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of air quality impacts during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.4.2 Operational Phase

In relation to the operational phase of the proposed development, the proposed development will not result in any significant emissions of air quality pollutants or greenhouse gases once operational. Therefore, the potential impact to air quality from the operational phase of the proposed development is expected to be insignificant. Therefore, no site specific mitigation measures are required.

Current EPA guidance states that a development may have an influence on global climate where it represents "a significant proportion of the national contribution to greenhouse gases" (EPA, 2003). The "*Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports*" (EPA 2022) states that impacts relevant to adaptation to climate change should be assessed and that projects should be assessed in terms of their vulnerability to climate change Therefore, the impact to climate from the operational phase of the proposed Project is expected to be imperceptible in terms of national CO_2 emissions and Ireland's agreed limit under the Kyoto Protocol (Framework Convention on Climate Change, 1997, 1999) and the EU Effort Sharing Agreement ("20-20-20" Targets). The proposed Project will not result in any impacts relevant to adaptation therefore the project will not be vulnerable to climate change.

On the basis of the above the potential effects on Air Quality are ***neutral***, ***imperceptible,*** and ***short-term*** for the operational phase. Therefore, the residual impact of the proposed project on ambient air quality is deemed to be ***imperceptible***.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of air quality impacts during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.5 NOISE AND VIBRATION

5.5.1 Construction Phase

During construction phase it is expected that there will be some temporary impact on the nearest residential receptors, such as residential properties immediately adjacent the northern and western boundaries of the proposed development site, due to noise emissions from the plant equipment required for construction.

The magnitude of noise generated will be dependent on a number of factors including the proximity of noise sensitive receptors, construction methods employed, the selection of plant and the construction programming. A variety of items of construction methods and plant items will be required during the various phases of the construction project. Noise will be generated primarily from the onsite construction activity however

noise can be generated during haulage of construction and waste materials to and from site.

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project.

The application of avoidance measures, such as binding hours of construction, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact will not be excessively intrusive. Any impacts will be short term in duration for the construction phase. The CEMP prepared by the construction contractor will include minimisation measures to ensure nuisance noise arising from, site clearance and construction activities is prevented where possible and managed in accordance with best practice.

The relevant measures include the following that will be adhered to, and set out in the contractors CEMP:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- All site access roads will be kept even to mitigate the potential for noise and vibration from lorries.
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Noise and vibration during the construction phase will be controlled with reference to the best practice control measures within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2. The contractor will ensure that all best practice noise and vibration control methods will be used as necessary in order to ensure impacts to nearby residential noise sensitive locations are not significant. This will be particularly important during site preparation works and piling works.
- Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted.
- Monitoring levels of noise and vibration during critical periods and at sensitive locations.
- Establishing channels of communication between the contractor/ developer, and residents so that receptors are aware of the likely duration of activities likely to generate higher noise or vibration.
- The Contractor appointing a Site Environmental Manager (SEM) responsible for matters relating to noise and vibration.

Noise and vibration effects on the environment following the implementation of standard construction mitigation measures, the residual impact can be characterised as ***negative***, ***slight to moderate,*** and ***temporary*** for the construction phase. Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of noise and vibration impacts during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.5.2 Operational Phase

The operation of the proposed development will remain consistent with the residential area and activity of the surrounding area. The proposed development will give rise to additional road traffic on public roads; this additional traffic from residential developments can give rise to ***imperceptible*** impacts in respect of noise to residential receptors. There is no likelihood of potential significant effects, and therefore no mitigation measures are proposed during the operational phase for noise and vibration.

The residual effects on noise and vibration are considered to be ***neutral***, ***imperceptible***, and ***short term*** for the operational phase. Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of noise and vibration impacts during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.6 LANDSCAPE AND VISUAL IMPACT

5.6.1 Construction Phase

The change of use of the Site from its existing use to that of a construction site will give rise to short term and substantially localised effects on landscape character. The initial construction operations created by the clearance of the Site and the construction of the modular buildings will give rise to short-term impacts on the landscape character, through the introduction of new structures, machinery, ancillary works etc. There will also be a change to the landscape character as a result of a land-use change.

It is likely that construction equipment will be visible from the Site during construction. This will have a temporary slight negative impact.

The residual impact on landscape and visual impact during construction will be ***neutral to negative, moderate,*** and ***temporary*** in duration.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of landscape and visual impacts during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.6.2 Operational Phase

The proposed development is short term and will not give rise to any long-term significant townscape or visual impacts resulting from the proposed development.

The proposed development would result in a positive contribution to the townscape character and urban fabric of Ballinasloe Town and the wider area.

Semi-mature specimen tree planting is proposed in open green spaces and road verges: Tilia Cordata - ‘Corinthian’, Acer Campestre – ‘Elsrijk’, Sorbus Aucuparia - ‘Sheerwater Seedling’, Crataegus Laevigata – ‘Paul Scarlet’.

Landscape impacts beyond the immediate context of the site are heavily diminished by the relatively contained nature of the development, which will only be visible from its immediate surrounding landscape. Furthermore, whilst the proposed development will result in a distinct visual change in this peri-urban/hinterland context, it does not appear incongruous and will likely be viewed as an extension to the Pollboy neighbourhood and Ballinasloe town, which it is located immediately north of the site.

In this regard, the significance of impacts from the development is predicted to be ***moderate,*** and ***short-term and reversable effect.***

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of landscape and visual impacts during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.7 CULTURAL HERITAGE AND ARCHAEOLOGY

5.7.1 Construction Phase

An Archaeological, Architectural and Cultural Heritage Scoping Report has been prepared for the proposed development site by CRDS Archaeological and Historical Consultants (Appendix C). There are no recorded archaeological site within the proposed development lands, however there are four recorded archaeological sites within c. 500m of the proposed development lands. None of these sites will be impacted, either directly or indirectly, by the proposed development works. Given the proposed development will include the excavation of topsoil from the site for the digging of pad foundations and services, up to a depth of c. 1m and the discovery of archaeological artifacts and features in the area, there is potential for previously unrecorded sub-surface archaeological remains to survive within the undisturbed portions of the proposed development footprint.

Due to the possibility of impacting on previously unrecorded archaeological features the potential impact on cultural heritage and archaeological are considered to be ***negative, moderate,*** and ***permanent.***

In order to mitigate against the archaeological risks of developing this site, the following is recommended:

1. The appointment of a suitably qualified archaeological consultant to oversee the project at construction phase.

2. The archaeological consultant should consult with the National Monuments Service and the design team, and implement a mitigation strategy, if required, in areas that have not been subjected to significant disturbance in the recent past.

3. This mitigation strategy should consider undertaking geophysical survey and archaeological testing prior to the commencement of the construction phase.

4. Dependent on the results of these surveys, archaeological monitoring of the topsoil strip at construction phase may also be required.

5. Any archaeological features identified during geophysical survey, testing or monitoring in areas where they will be impacted on by the development, will require permission from the National Monuments Service for the excavation (preservation by record) of these remains.

There are two recorded architectural heritage sites within c. 500m of the proposed development lands, as listed in the National Inventory of Architectural Heritage; both of which are listed in the Record of Monuments and Places. These sites will not be impacted, either directly or indirectly, by the proposed development works.

The residual impact on cultural heritage and archaeological are considered to be ***neutral, imperceptible*** and ***permanent.*** Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of cultural heritage and archaeology during the construction phase. The residual effect is not significant, and therefore a requirement for sub-threshold EIA does not arise.

5.7.2 Operational Phase

The operational phase of the proposed development is not predicted to have any impact on archaeological, architectural and cultural heritage.

In this regard any impacts upon cultural heritage and archaeological are considered to be ***neutral, imperceptible*** and ***short-term*** in nature.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of cultural heritage and archaeology impacts during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.8 MATERIAL ASSETS

5.8.1 Construction Phase

Utilities: Foul Sewer, Stormwater and Potable Water

The proposed development will have an impact upon other material assets and 'built services and infrastructure' (set out in the EPA Guidelines 2022) such as electricity, telecommunications and water supply.

During construction, contractors will require temporary power for onsite accommodation, and construction equipment /plant. The power requirements will be relatively minor. The power requirements for the construction programme will be met through a combination of a generator and a battery pack system. This setup will provide a reliable and continuous power supply to support the operation of essential equipment and facilities throughout the construction phase.

Water will be required for welfare facilities, dust suppression and general construction activities. Water for the construction site compound will be sourced from tank storage, ensuring an adequate and reliable water supply for various purposes.

There will also be foul wastewater requirements associated portable sanitary facilities within the construction compound. To manage foul waste effectively, tanks will be installed beneath the site cabins. These tanks will be used for collecting and storing foul waste generated within the compound. Regular emptying of these tanks will be carried out on a weekly basis or as needed, using a specialised sucker truck to ensure proper waste disposal and maintain a clean and hygienic environment.

Electrical connections will be made by suitably qualified personnel following consultation with the relevant authorities and will be cognisant of subsequent construction works. High voltage connections will be established for heavy duty equipment and site facilities, as required. All electrical works, including connection to the ESB network will be carried out by a suitably qualified contractor. The power and electrical supply requirements during construction phase are relatively minor, and there is no potential impact anticipated on existing users.

In respect of the foregoing, the predicted impacts upon foul sewer, stormwater and potable water are considered to be ***neutral, imperceptible*** and ***temporary***.

Traffic and Transportation

During the construction phase of the proposed development, there will be additional traffic movements to/from the Site from construction personnel, security staff, professional staff (i.e. design team, utility companies), excavation plant, dumper trucks and deliveries/removal of materials (waste/spoil).

The frequency of vehicles accessing the Site will vary throughout the construction phase. A site-specific Construction Traffic Management Plan will be prepared by the contractor.

Following the implementation of a Construction Traffic Management Plan the potential impacts on Traffic and Transportation are ***negative*****,** ***moderate*****,** and ***short term*** for the construction phase.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of traffic and transportation impacts during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

Waste and Waste Management

There will be some waste materials produced in the construction of the proposed scheme which will be disposed of using licensed waste disposal facilities and contractors. The scale of the waste production in conjunction with the use of licensed waste disposal facilities and contractors does not cause concern for likely significant effects on the environment.

The construction contractor will prepare a Construction and Demolition Waste Management Plan also known as a Resource Waste Management Plan (RWMP) in accordance with EPA guidance this will detail the methodologies employed for the control, management, monitoring and disposal of waste from the Site. The RWMP will be prepared in line with the *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* published by the EPA in 2021.

Other than waste generated from materials necessary for the construction of the building the proposed development will not produce significant volumes of waste.

All waste arising during the construction phase will be managed and disposed of in a way that ensures the provisions of the Waste Management Act 1996 as amended and associated amendments and regulations and the Waste Management Plan. In the event, there is excess material with no defined purpose, it will be transported to an authorised soil recovery site or notified to the EPA as a by-product when it will be beneficially used.

It is considered that the proposed development will not have any significant impact in terms of resources or waste generation.

A carefully planned approach to waste management will ensure that the impact on the environment will be ***neutral***, ***imperceptible,*** *and* ***temporary.***

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of material assets impacts during the construction phase. Therefore, a requirement for sub-threshold EIA does not arise.

5.8.2 Operational Phase

Utilities: Foul Sewer, Stormwater and Potable Water

The proposed development will have an impact upon other material assets such as 'built services and infrastructure' (set out in the EPA Guidelines 2022) such as electricity, telecommunications, gas and water supply.

The proposal will have an impact on servicing and utilities infrastructure in the area, requiring connections to electricity and drainage networks, as well as connecting to the existing road network.

Foul drainage requirements post development have been calculated by DBFL Consulting Engineers. It is anticipated that there will be an average discharge of 0.3 l/s, and peak discharge of 2.0 l/s. The site's internal foul water network will connect to an off site foul water network at the southeast corner of the site.

No public water supply infrastructure will be used. It is proposed that a borewell and associated infrastructure will be established onsite for groundwater abstraction and used as the water supply source for the development.

Surface water runoff from the site's internal road network will be directed to bioswales before entering the surface water network for the site. It is proposed to connect to the existing stormwater network at the southeast corner of the site. The site internal stormwater network will discharge at this point at the greenfield runoff rate (QBAR). A petrol interceptor is proposed just before the surface water outfall.

In respect of the foregoing, the predicted impacts upon foul sewer, stormwater and potable water are considered to be ***neutral, imperceptible*** and ***short-term***.

Traffic and Transportation

Traffic movements would be predominately from the residents themselves, but also from ancillary users such as waste collection, maintenance of private units and communal areas. A total of 101 no. car park spaces are proposed.

There are pedestrian routes and public transport routes within reach of the development. Pedestrian facilities are available between the site and Ballinasloe town. Major bus routes operated by Citylink, Transport for Ireland and Aircoach are available from Ballinasloe town within a 20-minute walk of the site. Ballinasloe Train Station is located 3.0 km from the site with regular trains travelling to both Galway and Dublin.

On the basis of the above the potential effects on Traffic and Transportation are ***neutral***, ***imperceptible***, and ***short term*** for the operational phase.

Having regard to the foregoing, there is no likelihood of significant effects on the environment arising from the proposed development in respect of traffic and transport impacts during the operational phase. Therefore, a requirement for sub-threshold EIA does not arise.

Waste and Waste Management

The proposed development will give rise to a variety of domestic waste streams during the operational phase, i.e. when the project is completed, and fully operational.

During the operational phase, a structured approach to waste management will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of waste prevention, reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be ***short-term, neutral*** and ***imperceptible***.

5.9 ASSESSMENT OF POTENTIAL IMPACTS FROM INTERACTIONS

This section discusses the potential interactions and inter-relationships between the environmental factors discussed in the preceding sections. This section covers both the construction phase and operational phases of the proposed development.

In accordance with the guidance not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

The majority of the interactions that are considered to have a neutral effect (i.e., no effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error).

The interaction of the foregoing impacts, described above, would not give rise to any significant negative impacts on the environment. The principal cumulative effect with other existing or approved development will be during the construction phase.

There is a potential interaction between land, soil geology, hydrogeology and hydrology through poorly managed surface water run-off during the construction phase of the proposed development. There is a potential for the construction activity in terms of air quality and of dust generated to impact on human health and biodiversity. There is a potential impact of noise and vibration on human health.

However, these potential interactions are short-term and associated with the construction phase. The CEMP will outline mitigations measures to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice and any subsequent planning conditions relevant to the proposed development.

It is considered that there will be no likely significant interactions which would require preparation of a sub-threshold EIAR.

5.10 ASSESSMENT OF POTENTIAL FOR CUMULATIVE IMPACTS

As part of the assessment of the proposed development, the likelihood of potential cumulative impact of the proposed development has been considered with any future development (as far as practically possible) and the cumulative impacts with developments in the locality (including planned and permitted developments).

As outlined in Section 3.2, above, a list of notable consented developments located in close proximity to the development site is included in Appendix A of this report.

Cumulative impacts are those impacts that relate to incremental / additive impacts of the planned development in addition to historical, present or foreseeable future actions. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects because of the coming together of two or more effects.

Mitigation is included in the project design to minimise impacts on the receiving environment. Each project currently permitted in the wider area is subject to planning conditions which include appropriate mitigation measures to minimise environmental impacts. Provided that mitigation measures for other developments are implemented as permitted, there will be no significant cumulative effects.

Any future development will be required to incorporate appropriate mitigation measures (e.g., noise management, dust management, traffic management, management of water quality in run-off water, landscape, etc) during the construction phase as such any cumulative development will not have a significant effect on human health, material assets, land, soils, geology, hydrogeology, and hydrology.

Any future development proposed on the surrounding lands should be cognisant with the zoning and will be subject to EIA and/or planning conditions which include appropriate mitigation measures to minimise environmental impacts.

Based on the assessment of the environmental sensitivities in the existing environment and consideration of potential cumulative impacts, it is concluded that there are no likely cumulative environmental impacts which would warrant preparation of an EIAR.

6.0 FINDINGS AND CONCLUSIONS

On the basis of the evaluation set out in Section 2.0 an EIA for the proposed Project is not mandatory. The proposed project is considered to be a sub-threshold development and therefore it is required to assess whether the proposed development is likely to have significant effects on the environment in order to determine whether the submission of an EIAR is required. The information necessary to enable this screening assessment has been provided in this report and the methodology used has been informed by the available guidance, legislation and directives.

It is concluded having regard to the nature, scale and location of the subject site, there is no real likelihood of significant effects on the environment arising from the proposed development on the environment (direct, indirect or cumulatively with other development) and therefore it is considered that the requirement for sub-threshold EIA does not arise.

The EIA Screening prepared by AWN Consulting has been reviewed and based on the information provided in this report the Commissioner of Public Works, as the competent authority, have determined that EIA is not required for the Proposed Development.

7.0 REFERENCES

European Union. Environmental Impact Assessment of Projects Guidance on Screening. EU Luxembourg: 2017.

European Union. Guidance on the preparation of the Environmental Impact Assessment Report. EU Luxembourg: 2017.

Department of Housing, Planning and Local Government. Guidelines for Planning Authorities and An Bord Pleanala on carrying out Environmental Impact Assessment. DHPLG: 2018.

Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017 z

Environmental Impact Assessment Screening, OPR Practice Note PN02 (Office of the Planning Regulator, 2021).

Environmental Protection Agency. Guidelines on the Information to be contained in Environmental Impact Assessment Reports. EPA 2022.

Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. Transport Infrastructure Ireland (2011).

Appendix A - Relevant Permitted Development

Application details	Description	Decision & Date
Applicant: Western Postform Ltd. **Reference:** 18287 **Location:** Pollboy, Co. Galway	for a production facility development to consist of : a) construction of a production facility with ancillary offices, showroom and staff facilities, external plant and storage areas, b)secure rear delivery yard, LPG tanks and compound and ESB sub-station, c) new vehicular access, d) new boundary treatments, e) all ancillary site works and services. Gross floor space of proposed works 3862.80 sqm.	**Decision:** Conditional **Date:** 19/06/2018
Applicant: Michael & Brendan Kelly **Reference:** 201968 **Location:** Pollboy, Co. Galway	to [a] extend the production area to the existing KPW printing works at the front & side [b] relocate doors to side elevation and [c] construct new internal site access road and new entrance onto the existing industrial estate road to the north of the site. Gross floor space of proposed works; 483 sqm.	**Decision:** Conditional **Date:** 06/10/2021
Applicant: Western Postform Ltd. **Reference:** 19223 **Location:** Pollboy, Co. Galway	for amendments to previously approved development, PL. Ref: 18-287. The proposed amendments consist of: Alterations to site boundary, Relocation of site entrance, Provision of ESB substation, Boiler room extension, dust extraction system system with storage silo and other associated external plant and equipment on rear (Western) elevation.	**Decision:** Conditional **Date:** 12/04/2019
Applicant: Discount Direct LTD t/a Billy's DIscount Store **Reference:** 2260218 **Location:** Pollboy, Co. Galway	for a warehouse development consisting of (1) 3 no. warehouses units with a total floor area of 2520m², (2.) connection to existing access road and services from adjoining Industrial park, (3.) Internal service roads, services and all associated site works.	**Decision:** Conditional **Date:** 11/07/2022
Applicant: Brothers of Charity Services Ireland Ltd **Reference:** 20418 **Location:** Pollboy, Co. Galway	for the construction of a community dwellinghouse, activity studio and for all associated site development works. Gross floor space of proposed works; 294sqm	**Decision:** Conditional **Date:** 01/09/2020
Applicant: Uisce Éireann **Reference:** 23162 **Location:** Ballinasloe Wastewater Treatment Plant , Canal Drive , Ballinasloe Co. Galway	for the development comprising of: demolition of the existing inlet works and construction of a new inlet works complete with new duty standby fine screens, a screenings handling unit, a vortex grit trap, a grit classifier, a storm overflow chamber, storm feed pumping station and a bypass channel with a manual bar screen; installation of a new storm water holding tank complete with storm return pumps and an internal cleaning system; installation of a new final effluent wash water pumping station; installation of a new GRP kiosk to house electrical control panel and all ancillary site works. A Natura Impact Statement (NIS) has been prepared in respect of the proposed development.	**Decision:** Conditional **Date:** 20/06/2023
Applicant: Irish Water **Reference:** 211626 **Location:** Pollboy, Co. Galway	for the development of ground-mounted Photovoltaic solar panels with a maximum square meterage of 290 sqm distributed over a grass area on-site with associated ancillary works. A Natura Impact Statement will be submitted to the planning authority with the application.	**Decision:** Conditional **Date:** 25/05/2022
Applicant: Cignal Infrastructure Ltd. **Reference:** 181820	to construct a 24 metre high multi-user lattice telecommunications structure, carrying antenna and dishes enclosed within a 2.4 metre high palisade fence compound together with associated ground equipment cabinets	**Decision:** Conditional **Date:** 18/02/2019

Application details	Description	Decision & Date
Location: Pollboy Td, Co. Galway		
Applicant: Pat Ward Western Automation **Reference:** 191400 **Location:** Pollboy, Co. Galway	to carry out alteration to existing industrial premises, to extend same, demolish existing out buildings and carry out ancillary site works. Gross floor space of proposed works: 44.66 sqm	**Decision:** Conditional **Date:** 25/05/2020
Applicant: Omniplex Holdings ULC **Reference:** 181525 **Location:** Dunlo, Co. Galway	for a new single storey 5 screen cinema approx. 7.9m high and associated site works and car parking at the site beside Aldi. Gross floor space of proposed works: 1123 sqm	**Decision:** Conditional **Date:** 24/06/2019
Applicant: Limehill Esker Ltd. **Reference:** 191978 **Location:** Dunlo, Co. Galway	for the following development on lands at Dunlo, Ballinasloe: Provision of (1) BLOCK A consisting of 1 No. One-bed apartment, 1 No. Three-Bed apartment, 4 No Two bed apartments, and a creche (321 Sq.m). (2) BLOCKS B1, B2, B3, B4, & B5 consisting of a total of 19 No Two-bed apartments and 19 No Three-bed maisonettes in a duplex arrangement (3) 7 No Three-bed detached two storey dwellings. (4) 2 No Two-bed detached single storey dwellings. (5) 4 No Two-bed semi-detached single storey dwellings. (6) 21 No Three-bed terraced two storey dwellings. (7) 2 No. Four-bed end-of-terrace two storey dwellings. (8) 8 No Two-bed semi-detached two storey dwellings. (9) All associated site development works and connection into existing services. Gross floor space of proposed works: 9354 sqm (Residential Dwellings - 9022 sqm, Creche - 332 sqm).	**Decision:** Conditional **Date:** 24/07/2020
Applicant: Cluid Housing **Reference:** 181881 **Location:** Dunlo, Co. Galway	for revisions to approved development (Ref No. 12/9024) comprising the construction of 17 no. single-storey terrace houses and a communal facilities building for older people. The proposed revision comprises: omission of the approved communal facilities building and the addition of 1 no. single storey one-bedroom dwelling and associated site development works.	**Decision:** Conditional **Date:** 21/02/2019
Applicant: Ballinasloe GAA **Reference:** 21338 **Location:** Dunlo td, Co. Galway	for construction of the following: 4 open air tennis courts, access road, car parking facilities, service pipe networks, fencing and general ancillary site works.	**Decision:** Conditional **Date:** 04/05/2021
Applicant: Garry Zancanaro & Joe Staunton **Reference:** 22745 **Location:** Dunlo, Co. Galway	for construction of the following: 4 open air tennis courts, access road, car parking facilities, service pipe networks, fencing and general ancillary site works.	**Decision:** Unconditional **Date:** 29/07/2022
Applicant: Discount Direct LTD t/a Billy's DIscount Store **Reference:** 2260218 **Location:** in the townland of Pollboy	for a warehouse development consisting of (1) 3 no. warehouses units with a total floor area of 2520m², (2.) connection to existing access road and services from adjoining Industrial park, (3.) Internal service roads, services and all associated site works.	

APPENDIX B

APPROPRIATE ASSESSMENT SCREENING

PREPARED BY MOORE GROUP, 2023

Report for the purposes of Appropriate Assessment Screening

OPW Modular Homes Pollboy

Prepared by: Moore Group – Environmental Services

11 March 2024

On behalf of The Commissioners of Public Works in Ireland
on behalf of the Department for Children, Equality, Disability, Integration and Youth

Project Proponent	The Commissioners of Public Works in Ireland
Project	OPW Modular Homes Pollboy
Title	Report for the purposes of Appropriate Assessment Screening OPW Modular Homes Pollboy

Project Number	22161	**Document Ref**	22161 OPW Mod Homes Pollboy AAS1 Rev0	
Revision	**Description**	**Author**		**Date**
Rev0	Issued to Client	G. O'Donohoe		21 November 2023
Rev1	Final Issue	G. O'Donohoe		23 February 2024
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Moore Archaeological and Environmental Services Limited				

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Abbreviations

AA	Appropriate Assessment
ABP	An Bord Pleanála
CEMP	Construction Environmental Management Plan
EEC	European Economic Community
EPA	Environmental Protection Agency
EU	European Union
FWPM	Freshwater Pearl Mussel
GIS	Geographical Information System
LAP	Local Area Plan
NHA	Natural Heritage Area
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OSI	Ordnance Survey Ireland
pNHA	proposed Natural Heritage Area
SAC	Special Area of Conservation
SPA	Special Protection Area
SuDS	Sustainable Drainage System
UÉ	Uisce Éireann
WFD	Water Framework Directive

1. Introduction

1.1. General Introduction

This report for the purposes of Appropriate Assessment (AA) Screening contains information required for the competent authority to undertake screening for Appropriate Assessment (AA) in respect of the construction and operation of a residential development of modular homes at Pollboy, Ballinasloe, Co. Galway (hereafter referred to as the Proposed Development) to determine whether it is likely individually or in combination with other plans or projects to have a significant effect on any European sites, in light of best scientific knowledge.

Having regard to the provisions of the Planning and Development Act 2000, as amended (the "Planning Acts") (section 177U), the purpose of a screening exercise under section 177U of the PDA 2000 is to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with other plans or projects is likely to have a significant effect on a European site.

If it cannot be *excluded* on the basis of objective information that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site then it is necessary to carry out a Stage 2 appropriate assessment under section 177V of the Planning Acts.

When screening the project, there are two possible outcomes:

- the project poses no potential for the possibility of a significant effect and as such requires no Stage 2 assessment; or

- the project has potential to have a significant effect (or this is uncertain and therefore cannot be excluded) and therefore a Stage 2 Appropriate Assessment of the project is necessary.

This report has been prepared by Moore Group - Environmental Services to enable the competent authority to carry out AA screening in relation to the Proposed Development. The report was compiled by Ger O'Donohoe B.Sc. Applied Aquatic Sciences (ATU Galway, 1993) & M.Sc. Environmental Sciences (TCD, 1999) who has 30 years' experience in environmental impact assessment and has completed numerous Appropriate Assessment Screening Reports and Natura Impact Statements on terrestrial and aquatic habitats for various development types.

1.2. Legislative Background - The Habitats and Birds Directives

Article 6(3) and 6(4) of the Habitats Directive are transposed into Irish Law inter alia by the Part XAB of the Planning Acts (in particular section 177U and 177V) which governs the requirement to carry out appropriate assessment screening and appropriate assessment, where required, per Section 1.1 above.

The Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) is the main legislative instrument for the protection and conservation of biodiversity in the European Union (EU). Under the Habitats Directive, Member States are obliged to designate Special Areas of Conservation (SACs) which contain habitats or species considered important for protection and conservation in a EU context.

The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds), transposed into Irish law by the Bird and Natural Habitats Regulations 2011 as amended, and the Wildlife Act 1976, as amended, is concerned with the long-term protection and management of all wild bird species and their habitats in the EU. Among other things, the Birds Directive requires that Special Protection Areas (SPAs) be established to protect migratory species and species which are rare, vulnerable, in danger of extinction, or otherwise require special attention.

SACs designated under the Habitats Directive and SPAs, designated under the Birds Directive, form a pan-European network of protected sites known as Natura 2000. The Habitats Directive sets out a unified system for the protection and management of SACs and SPAs. These sites are also referred to as European sites.

Articles 6(3) and 6(4) of the Habitats Directive set out the requirement for an assessment of proposed plans and projects likely to have a significant effect on Natura 2000 sites.

Article 6(3) establishes the requirement to screen all plans and projects and to carry out an appropriate assessment if required (Appropriate Assessment (AA)). Article 6(4) establishes requirements in cases of imperative reasons of overriding public interest:

> ***Article 6(3):*** *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to an appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

2. Methodology

The Commission's methodological guidance (EC, 2002, 2018, 2021 see Section 2.1 below) promotes a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Stages 1 and 2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of Article 6(3) or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

Stage 1 Screening: This stage examines the likely effects of a project either alone or in combination with other plans and projects upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. In order to screen out a project, it must be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

Stage 2 Appropriate Assessment: This stage examines whether it is likely that the project, either alone or in combination with other projects or plans, will have a significant effect upon the integrity of a European site. In order to 'screen out' a project (i.e. in order to conclude that it is not necessary to move to the 'Stage 2' appropriate assessment stage (see immediately below), the possibility that the Proposed Development (individually or in combination with other plans or projects), will have a significant effect on the integrity of a European site must be excluded on the basis of objective information.

Stage 3 Assessment of Alternative Solutions: This stage examines alternative ways of implementing the project that, where possible, avoid any adverse impacts on the integrity of the Natura 2000 site.

Stage 4 Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the sites will be necessary.

To ensure that the Proposed Development complies fully with the requirements of Article 6 of the Habitats Directive and all relevant Irish transposing legislation, Moore Group compiled this report to enable the competent authority to carry out AA screening in relation to the Proposed Development to determine whether it can be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site(s).

2.1. Guidance

This report has been compiled in accordance with guidance contained in the following documents:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 rev.).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC, 2018).
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021).
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021).

- Office of the Planning Regulator (OPR) Practice Note PN01 Appropriate Assessment Screening for Development Management (OPR, 2021).

2.2. Data Sources

Sources of information that were used to collect data on the Natura 2000 network of sites, and the environment within which they are located, are listed below:

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
    - National Parks & Wildlife (NPWS) protected site boundary data;
    - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
    - OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
    - Digital Elevation Model over Europe (EU-DEM);
    - Google Earth and Bing aerial photography 1995-2023;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
    - Natura 2000 - Standard Data Form;
    - Conservation Objectives;
    - Site Synopses;
- National Biodiversity Data Centre records;
    - Online database of rare, threatened and protected species;
    - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019); and
- Relevant Development Plans;

    Galway County Development Plan 2022-2028

3. Description of the Proposed Development

The Proposed Development consists of the construction of 64 no. modular housing units to provide emergency temporary accommodation for up to 256 no. Ukrainian refugees and 101 no. car parking spaces to accompany the dwellings.at Pollboy, Ballinasloe, Co. Galway.

A habitat survey was carried out by Moore Group on 30 August 2023. Areas which were highlighted during desktop assessment were investigated in closer detail according to the Heritage Council Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011). Habitats in the proposed development area were classified according to the Heritage Council publication “A Guide to Habitats in Ireland” (Fossitt, 2000). This publication sets out a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. This form of

classification uses codes to classify different habitats based on the plant species present. Species recorded in this report are given in both their Latin and English names. Latin names for plant species follow the nomenclature of "An Irish Flora" (Parnell & Curtis, 2012).

Signs of mammals such as badgers and otters were searched for while surveying the study area noting any sights, signs or any activity in the vicinity especially along adjacent boundaries.

Birds were surveyed using standard transect methodology and signs were recorded where encountered during the field walkover surveys.

Improved agricultural grassland predominates with patches of dry semi-natural grassland on sloped free-draining areas. A hedgerow with several tall trees bounds the site to the west, which is bounded to the north by a housing estate, to the east by the Pollboy Road, and to the south by a light industrial development and open grassland. There is a small wetter area of Marsh toward the southeastern end of the site, with wet grassland and willow scrub fringing this area.

No flora or terrestrial fauna species or habitats of national or international conservation importance were noted on site during the survey.

There were no invasive species recorded at the proposed development site.

Figure 1 shows the Proposed Development location and Figure 2 shows a detailed view of the Proposed Development boundary on recent aerial photography. Figure 3 shows the layout of the Proposed Development.

Figure 1. Showing the Proposed Development location at Ballinasloe, Co. Galway.

Figure 2. Showing the Proposed Development boundary on recent aerial photography.

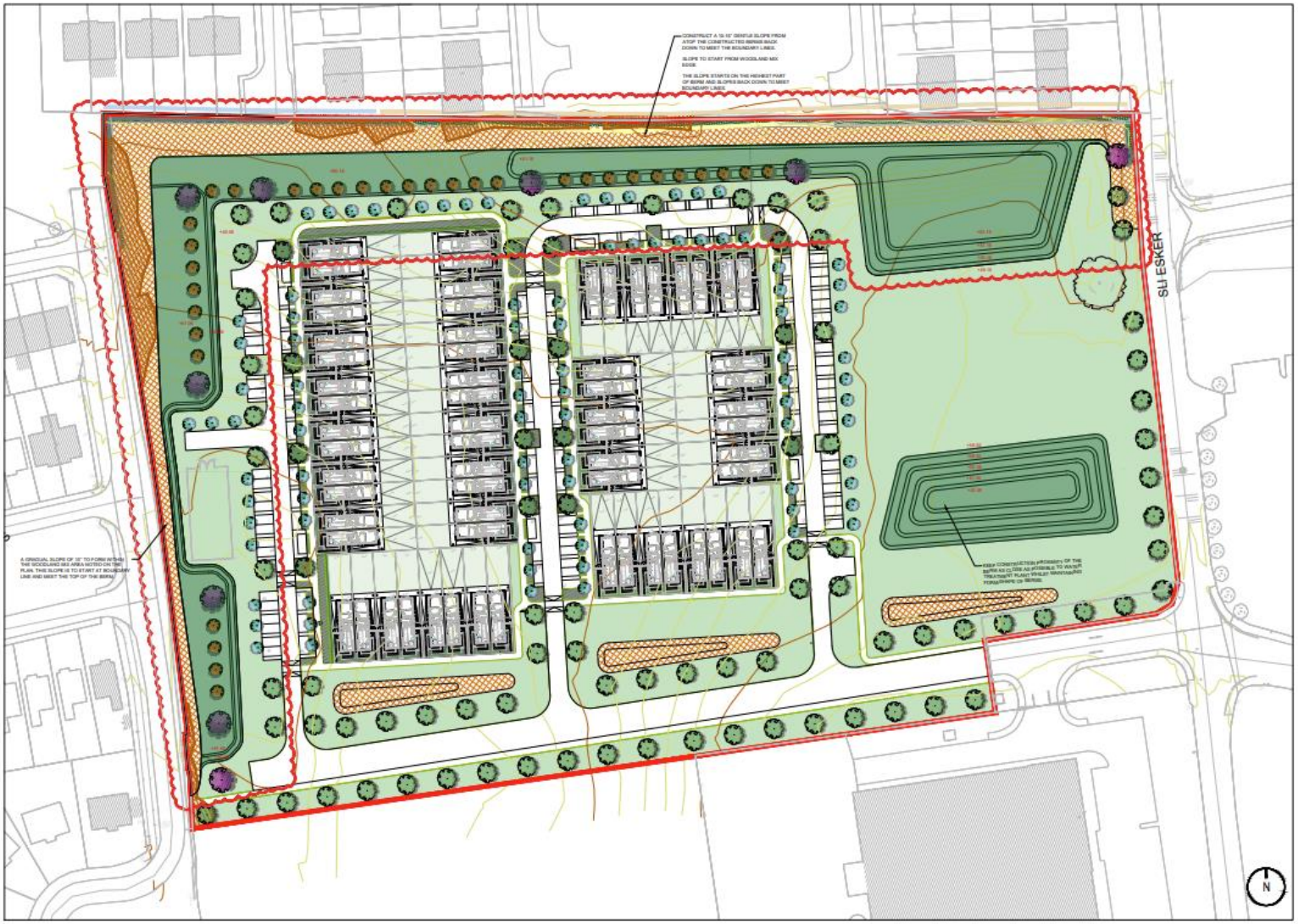

Figure 3. Plan of the Proposed Development.

4. Identification of Natura 2000 Sites

4.1. Description of Natura Sites Potentially Significantly Affected

A Zone of Influence (ZoI) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. In accordance with the OPR Practice Note (2021), PN01, the ZoI should be established on a case-by-case basis using the Source- Pathway-Receptor framework.

The European Commission's "*Assessment of plans and projects in relation to Natura 2000 sites guidance on Article 6(3) and (4) of the Methodological Habitats Directive 92/43/EEC*" published 28 September 2021 states at section 3.1.3, that:

"Identifying the Natura 2000 sites that may be affected should be done by taking into consideration all aspects of the plan or project that could have potential effects on any Natura 2000 sites located within the zone of influence of the plan or project. This should take into account all of the designating features (species, habitat types) that are significantly present on the sites and their conservation objectives. In particular, it should identify:

- *any Natura 2000 sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;*
- *any Natura 2000 sites within the likely zone of influence of the plan or project Natura 2000 sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g. water) and various types of waste, discharge or emissions of substances or energy;*
- *Natura 2000 sites in the surroundings of the plan or project (or at some distance) which host fauna that can move to the project area and then suffer mortality or other impacts (e.g. loss of feeding areas, reduction of home range);*
- *Natura 2000 sites whose connectivity or ecological continuity can be affected by the plan or project".*

The range of Natura 2000 sites to be assessed, i.e. the zone in which impacts from the plan or project may arise, will depend on the nature of the plan or project and the distance at which effects may occur. For Natura 2000 sites located downstream along rivers or wetlands fed by aquifers, it may be that a plan or project can affect water flows, fish migration and so forth, even at a great distance. Emissions of pollutants may also have effects over a long distance. Some projects or plans that do not directly affect Natura 2000 sites may still have a significant impact on them if they cause a barrier effect or prevent ecological linkages. This may happen, for example, when plans affect features of the landscape that connect Natura 2000 sites or that may obstruct the

movements of species or disrupt the continuity of a fluvial or woodland ecosystem. To determine the possible effects of the plan or project on Natura 2000 sites, it is necessary to identify not only the relevant sites but also the habitats and species that are significantly present within them, as well as the site objectives.

The Zone of Influence may be determined by considering the Proposed Development's potential connectivity with European sites, in terms of:

- Nature, scale, timing and duration of all aspects of the proposed works and possible impacts, including the nature and size of excavations, storage of materials, flat/sloping sites;
- Distance and nature of potential pathways (dilution and dispersion; intervening 'buffer' lands, roads etc.); and
- Location of ecological features and their sensitivity to the possible impacts.

The potential for source pathway receptor connectivity is firstly identified through GIS interrogation and detailed information is then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Proposed Development are listed in Table 1 and presented in Figures 4 and 5, below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 21 November 2023. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHA and European sites.

Table 1 European Sites located within the potential Zone of Influence[1] of the Proposed Development.

Site Code	Site name	Distance (km)[2]
000216	River Shannon Callows SAC	11.66
002213	Glenloughaun Esker SAC	3.76
004096	Middle Shannon Callows SPA	11.67
004097	River Suck Callows SPA	0.65

The nearest European site to the Proposed Development is the River Suck Callows SPA (Site Code 004097) c.650m to the northeast. Glenloughaun Esker SAC (Site Code 002213) is 3.76km to the southwest, however as there is no connectivity to this site, it is screened out at this stage. The River Shannon Callows SAC (Site Code 000216), and the Middle Shannon Callows SPA (Site Code 004097), both over 11km to the east are screened out due to their distance from the Proposed Development and lack of connectivity.

There is no connectivity to any European sites within a potential Zone of Influence of the Proposed Development

The Qualifying Interests (QIs) and Special Conservation Interests (SCIs) of the European sites in the Zone of influence of the Proposed Development are provided in Table 2 below.

[1] All European sites potentially connected irrespective of the nature or scale of the Proposed Development.
[2] Distances indicated are the closest geographical distance between the Proposed Development and the European site boundary, as made available by the NPWS.

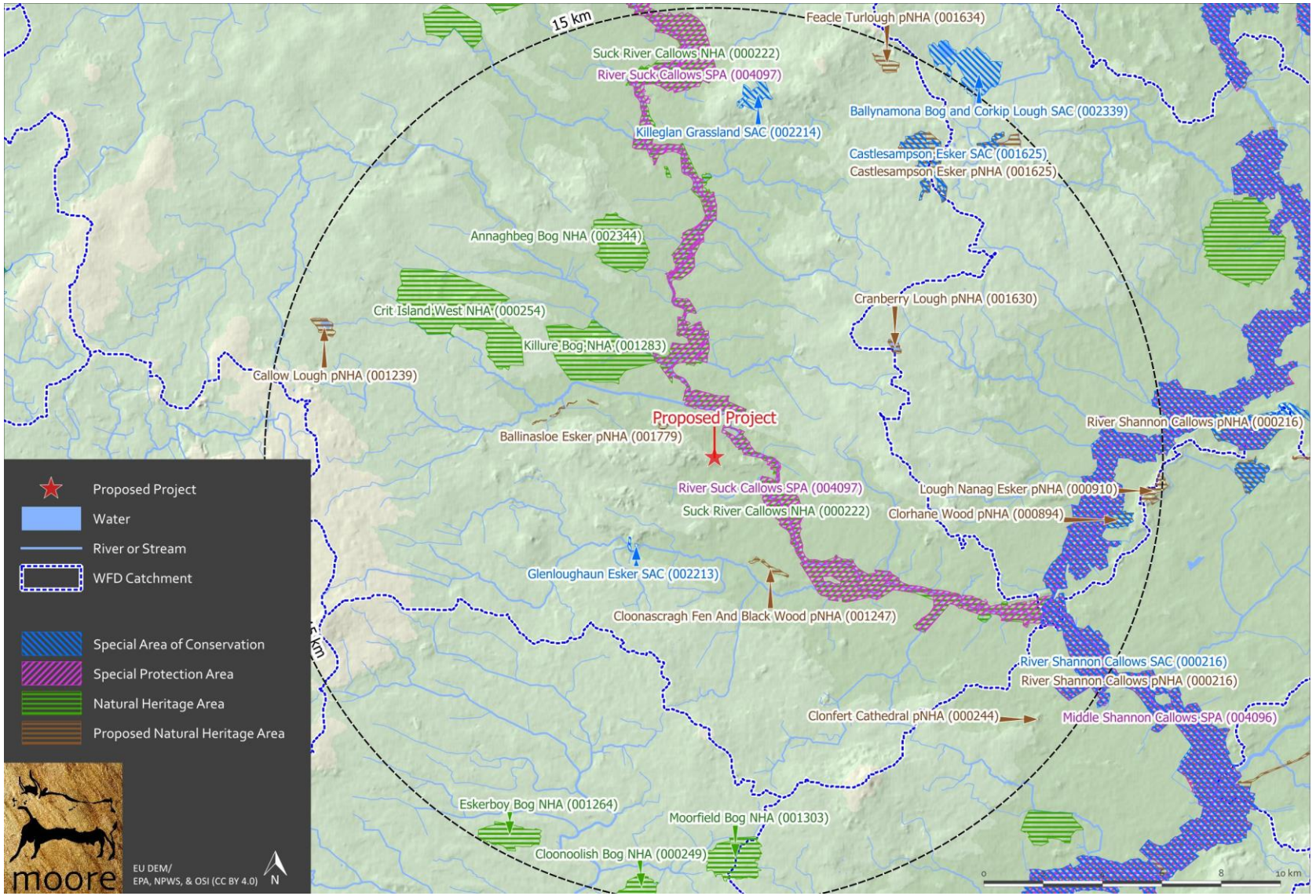

Figure 4. Showing European sites and NHAs/pNHAs within the wider Potential Zone of Influence of the Proposed Development.

Figure 5. Detailed view of European sites in the nearer Potential Zone of Influence of the Proposed Development.

*Table 2 Identification of relevant European sites using Source-Pathway-Receptor model and compilation of information on QIs and conservation objectives. *Priority Habitats*

European Site name, Site code and Conservation Objectives	Location Relative to the Proposed Development Site	Connectivity – Source-Pathway-Receptor	Considered further in Screening – Y/N
River Suck Callows SPA (004097) The overall aim of the Birds Directive is to maintain or restore the favourable conservation status of habitats and species of community interest: A038 Whooper Swan *Cygnus cygnus* A050 Wigeon *Anas penelope* A140 Golden Plover *Pluvialis apricaria* A142 Lapwing *Vanellus vanellus* A395 Greenland White-fronted Goose *Anser albifrons flavirostris* A999 Wetlands NPWS (2022) Conservation Objectives: River Suck Callows SPA 004097. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.A069 Red-breasted Merganser *Mergus serrator*	0.65km to the northeast of the Proposed Development	No Due to distance and the lack of any relevant ex-situ factors of significance to bird species or wetland habitat.	No

4.2. Ecological Network Supporting Natura 2000 Sites

A concurrent GIS analysis of the proposed Natural Heritage Areas (pNHA) and designated Natural Heritage Areas (NHA) in terms of their role in supporting the species using Natura 2000 sites was undertaken along with GIS investigation of European sites. These supporting roles mainly relate to mobile fauna such as mammals and birds which may use pNHAs and NHAs as ecological corridors or "stepping stones" between Natura 2000 sites.

Article 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows were taken into account in the decision process and during the preparation of this AA Screening report.

The NHAs and pNHAs identified in Figure 4 are located outside the Zone of Influence, with the exception of those which share the boundaries of the River Suck Callows SPA. Accordingly, the River Suck Callows NHA is considered under its higher conservation status as a European site.

5. Identification of Potential Impacts & Assessment of Significance

The Proposed Development is not directly connected with or necessary to the management of the sites considered in the assessment and therefore potential impacts must be identified and considered.

5.1. Assessment of Likely Significant Effects

The Proposed Development is located in an undeveloped area, adjacent to residential and light industrial areas, in Pollboy in the southeast of Ballinasloe, Co. Galway.

There is no connectivity to any European sites within a potential Zone of Influence of the Proposed Development.

The consideration of all potential direct and indirect impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the Proposed Development are presented in Table 3.

Table 3 Assessment of Likely Significant Effects.

Identification of all potential direct and indirect impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the project.	
Impacts:	**Significance of Impacts:**
Construction phase e.g. Vegetation clearance Demolition Surface water runoff from soil excavation/infill/landscaping (including borrow pits) Dust, noise, vibration Lighting disturbance Impact on groundwater/dewatering Storage of excavated/construction materials Access to site Pests	None The Proposed Development site is located within the boundary of a field improved grassland, with occasional scrub.

Operational phase e.g. Direct emission to air and water Surface water runoff containing contaminant or sediment Lighting disturbance Noise/vibration Changes to water/groundwater due to drainage or abstraction Presence of people, vehicles and activities Physical presence of structures (e.g. collision risks)	All foul and surface water runoff, once the facility is operational, will be contained on site and discharged to urban drainage systems. There is no real likelihood of any significant effects on European Sites in the wider catchment area. The facility is located at a distance of removal such that there will be no disturbance to qualifying interest species in any European sites.
Describe any likely changes to the European site:	
Examples of the type of changes to give consideration to include: Reduction or fragmentation of habitat area Disturbance to QI species Habitat or species fragmentation Reduction or fragmentation in species density Changes in key indicators of conservation status value (water quality etc.) Changes to areas of sensitivity or threats to QI Interference with the key relationships that define the structure or ecological function of the site Climate change	None. The Proposed Development site is not located adjacent or within a European site, therefore there is no risk of habitat loss or fragmentation or any effects on QI habitats or species directly or ex-situ.

5.2. Assessment of Potential In-Combination Effects

In-combination effects are changes in the environment that result from numerous human-induced alterations. In-combination effects can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

As part of the Screening for an Appropriate Assessment, in addition to the Proposed Development, other relevant plans and projects in the area must also be considered at this stage. This step aims to identify at this early stage any possible significant in-combination effects of the Proposed Development with other such plans and projects on European sites.

A review of the National Planning Application Database was undertaken. The database was then queried for developments granted planning permission within 500m of the Proposed Development within the last three years, these are presented in Table 4 below.

Table 4.Planning applications granted permission in the vicinity of the Proposed Development.

Planning Ref.	Description of development	Comments
191978	for the following development on lands at Dunlo, Ballinasloe: Provision of (1) BLOCK A consisting of 1 No. One-bed apartment, 1 No. Three-Bed apartment, 4 No Two bed apartments, and a creche (321 Sq.m). (2) BLOCKS B1, B2, B3, B4, & B5 consisting of a total of 19 No Two-bed apartments and 19 No Three-bed maisonettes in a duplex arrangement (3) 7 No Three-bed detached two storey dwellings. (4) 2 No Two-bed detached single storey dwellings. (5) 4 No Two-bed semi-detached single storey dwellings. (6) 21 No Three-bed terraced two storey dwellings. (7) 2 No. Four-bed end-of-terrace two storey dwellings. (8) 8 No Two-bed semi-detached two storey dwellings. (9) All associated site development works and connection into existing services. Gross floor space of proposed works: 9354 sqm (Residential Dwellings - 9022 sqm, Creche - 332 sqm)	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
201968	to [a] extend the production area to the existing KPW printing works at the front & side [b] relocate doors to side elevation and [c] construct new internal site access road and new entrance onto the existing industrial estate road to the north of the site. Gross floor space of proposed works; 483 msq	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
20229	to consist of the construction of a café building to be used for the preparation and sale of food and beverages for consumption on and off the premises. The proposal also includes associated signage, a bin storage, an external seating area, a new footpath, hard and soft landscaping, 10 no. bicycle parking spaces, 2 no. universal access spaces. Gross floor space of proposed works; 232sqm & 10 sqm (bin store)	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
20418	for the construction of a community dwellinghouse, activity studio and for all associated site development works. Gross floor space of proposed works; 294sqm	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
211378	(1) extension (42.09 sqm) to rear & side of existing dwelling house, (2)demolition of existing shed and the replacement of a domestic shed (67 sqm)	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
211853	for development at a c.0.013 ha site in the car park. The development will consist of (i) the construction of a sheltered canopy (c. 50 sq.m) in the existing car park for the purpose of providing 2 no. dedicated "Click and Collect" spaces for the existing Tesco Store; (ii) ancillary signage; and (iii) a pedestrian crossing and all associated site development works.	No potential for in-combination effects given the Proposed Development will have no effect on any European site.

Planning Ref.	Description of development	Comments
212017	for development at a c.0.012 ha site in the carpark of Tesco, Dunlo, Ballinasloe. The development will consist of retention permission for 'Click and Collect' signage in the existing Tesco carpark and all associated site development works.	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
21757	to reconstruct and extend existing dwelling house to include all associated site works. Gross floor space of proposed works: Extension 23.10 sqm	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
22378	for I) permission for "Click and Collect" signage in the existing Tesco car park, II) the construction of a sheltered canopy (c. 102 sqm) in the existing car park for the purpose of providing 4 no. dedicated "Click and Collect" car parking spaces for the existing Tesco store, III) removal of previously approved and as built "Click and Collect" canopy (permitted under reg. ref. 21/1853), IV) removal of previously approved and as built "Click and Collect" signage (permitted under reg. ref 21/2017), V) all associated site development works	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
22593	for a single storey extension (40.5sqm) to east elevation of existing dwelling house. Gross floor space of proposed works: 40.5 sqm. Gross floor space of works to be retained: 187.09 sqm	No potential for in-combination effects given the Proposed Development will have no effect on any European site.
2260218	for a warehouse development consisting of (1) 3 no. warehouses units with a total floor area of 2520m², (2.) connection to existing access road and services from adjoining Industrial park, (3.) Internal service roads, services and all associated site works.	No potential for in-combination effects given the Proposed Development will have no effect on any European site.

The Galway County Development Plan in complying with the requirements of the Habitats Directive requires that all Projects and Plans that could affect the Natura 2000 sites in the same potential Zone of Influence of the Proposed Development site would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any, in-combination impacts with Plans or Projects for the proposed development area and surrounding townlands in which the proposed development site is located, would be avoided.

The listed developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement with regard to the Habitats Directive. The development cannot have received planning permission without having met the consenting authority requirement in this regard.

There are no predicted in-combination effects given that it is predicted that the Proposed Development will have no effect on any European site.

Any new applications for the Proposed Development area will be assessed on a case by case basis *initially* by Galway County Council which will determine the requirement for AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

6. Conclusion

There is no connectivity to any European sites within or outside the potential Zone of Influence.

There are no predicted effects on any European sites given:

- The distance between the Proposed Development and any European Sites, approximately 650m;
- The lack of direct connectivity between the Proposed Development and any hydrological pathways; there are no watercourses within the Proposed Development boundary and there is no connectivity between the Proposed Development site and any watercourses that lead to any European sites;
- The Proposed Development is to be connected to the existing public sewer network for the treatment of wastewater.
- There are no predicted emissions to air, water or the environment during the construction or operational phases that would result in significant effects.

It has been objectively concluded by Moore Group Environmental Services that:

1. The Proposed Development is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
2. The Proposed Development is not likely to either directly or indirectly significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
3. The Proposed Development, either alone or in combination with other plans or projects, is not likely to have significant effects on a European site.
4. It is possible to conclude that significant effects can be excluded at the screening stage.

It can be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on any European site, in the absence of any mitigation.

An appropriate assessment is not, therefore, required.

A final determination will be made by the competent authority in this regard.

7. References

Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of Plans and Projects in Ireland (as amended February 2010).

European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive '92/43/EEC: Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interests, compensatory measures, overall coherence and opinion of the Commission. European Commission, Brussels.

European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Brussels 28.9.21.

European Commission (2021) Guidance document on the strict protection of animal species of Community interest under the Habitats Directive, Brussels 12.10.21.

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2023) National Parks and Wildlife Service Metadata available online at https://www.npws.ie/maps-and-data

Office-of-the-Planning-Regulator (2021) Appropriate Assessment Screening for Development Management OPR Practice Note PN01. March 2021

APPENDIX C

ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE PRELIMINARY APPRAISAL

PREPARED BY CRDS, 2023

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Archaeological, Architectural and Cultural Heritage

SCOPING REPORT

Pollboy, Ballinasloe,
County Galway

September 2023

Dr Stephen Mandal MIAI PGeo EurGeol

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1. Executive Summary

On behalf of AWN Consulting (for the OPW), CRDS Ltd have undertaken an archaeological scoping assessment for the proposed development lands at Pollboy, County Galway, c. 1km south of the centre of Ballinsloe town (ITM 585162 729934). The study comprised an examination of available archaeological, architectural heritage and historical sources, including the following: Recorded archaeological sites and monuments; Topographical finds; Archaeological Excavations; Architectural Heritage; Cartographic sources; Aerial Photography; Historical Research.

The potential archaeological, architectural and cultural heritage risk at the site can be summarised as follows:

- There are no recorded archaeological site within the proposed development lands.
- There are four recorded archaeological sites within c. 500m of the proposed development lands. None of these sites will be impacted, either directly or indirectly, by the proposed development works.
- Five stone axeheads have been found within the study area.
- There are records of three archaeological excavations in the area in advance of development works, one of which identified archaeological features.
- These indicate that the wider area has been inhabited from at least the Neolithic.
- A desk-top survey of the lands proposed for development, did not highlight any additional, previously unrecorded, archaeological features.
- Cartographic research indicates that the land on which the proposed development is sited has been parkland in open pasture since at least the early part of the 19th century.
- A review of aerial photography indicates that the majority of the proposed development lands were part of a large quarry in the late 2000s / early 2010s.
- However, the northern portion of the proposed development lands do not appear to have been impacted by development in the past.

Therefore, there is potential for previously unrecorded sub-surface archaeological remains to survive within the undisturbed portions of the proposed development footprint.

There are two recorded architectural heritage sites within c. 500m of the proposed development lands, as listed in the National Inventory of Architectural Heritage; both of which are listed in the Record of Monuments and Places. These sites will not be impacted, either directly or indirectly, by the proposed development works.

The proposed development will include the excavation of topsoil from the site for the digging of pad foundations and services, up to a depth of c. 1m. As noted above, there is the potential for encountering previously unrecorded archaeological sub-surface remains during the construction phase of the proposed development.

In order to mitigate against the archaeological risks of developing this site, the following is recommended:

1. The appointment of a suitably qualified archaeological consultant to oversee the project at construction phase.
2. The archaeological consultant should consult with the National Monuments Service and the design team, and implement a mitigation strategy, if required, in areas that have not been subjected to significant disturbance in the recent past.
3. This mitigation strategy should consider undertaking geophysical survey and archaeological testing prior to the commencement of the construction phase.
4. Dependent on the results of these surveys, archaeological monitoring of the topsoil strip at construction phase may also be required.
5. Any archaeological features identified during geophysical survey, testing or monitoring in areas where they will be impacted on by the development, will require permission from the National Monuments Service for the excavation (preservation by record) of these remains.

Please note that the recommendations given here are subject to the approval of the National Monuments Service, Department of the Culture, Heritage and the Gaeltacht.

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2. Baseline Survey

2.1. Introduction

The proposed development is located in the townland of Pollboy, County Galway, c. 1km south of the centre of Ballinsloe town (ITM 585162 729934; see Figure 1). The proposed development lands comprise a single field in open pasture, bounded to the west, north and east by modern roads and housing development, and to the south by industrial development. To set the proposed development within its wider archaeological, architectural and cultural heritage landscape, and to assess the potential of encountering such features on the site, a high level paper survey of archaeological, architectural heritage, historical and cartographic sources was undertaken. A study are of approximately 500m radius around the proposed development site was chosen.

2.2. Recorded archaeological sites and monuments

The Record of Monuments and Places was consulted for the relevant parts of Co. Galway. This is a list of archaeological sites known to the National Monuments Service. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, OPW Archaeological Survey notes and other relevant publications. There are no recorded sites listed in the Sites and Monuments Record within the site boundary. There are eight within the study area, of which seven are scheduled for inclusion in the next revision of the Record of Monuments and Places (see Figure 1, Table 1 and Appendix 1).

2.3. Topographical finds

Published catalogues of prehistoric material were studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers) and the Irish Stone Axe Project Database (Archaeology Dept., U.C.D.). Five stone axeheads were recorded through the Irish Stone Axe Project database (see Table 2). It is important to noted that the topographical files in the National Museum of Ireland were not consulted. This is the National archive of all known finds recorded by the National Museum. It relates primarily to stray artefacts.

2.4. Archaeological Excavations

The excavation bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within c. 500m of the proposed development. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2022. There are two archaeological excavations recorded from the study area, one of which uncovered archaeological remains (see Figure 1, Table 3 and Appendix 2).

2.5. Down Survey

Taken in the years 1656-1658, the Down Survey of Ireland is the first ever detailed land survey on a national scale anywhere in the world. The survey, led by William Petty, sought to measure all the land to be forfeited by the Catholic Irish in order to facilitate its redistribution to Merchant Adventurers and English soldiers (www.downsurvey.tcd.ie). The Down Survey map for the county is given as Figure 2. The barony and parish maps were unfortunately destroyed in 1711.

2.6. Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a systematic programme of identification, classification, and evaluation of the architectural heritage of the State. The Minister for Arts, Heritage and the Gaeltacht is currently using the Inventory as the basis for making recommendations for the NIAH. There are two structures included in the NIAH within the study area (see Figure 1, Table 3 and Appendix 3).

2.7. Cartographic sources

Analysis of cartographic sources is important in tracing the development of the site. Sources included:

- Ordnance Survey 1st Edition – Scale 6 inches: 1 mile (1838-1842). The first comprehensive series of maps covering the whole of Ireland, which was the first country in the world to be mapped in this manner (Figure 3).
- Ordnance Survey 25-inch Maps: Scale 25-inches: 1 mile. Mostly date from the 1890s up to c. 1915 with later printings (Figure 4)

2.8. Aerial Photography

Available online sources for aerial photography were consulted, including the Ordnance Survey, Geological Survey and National Monuments Service collections (see Figures 5-8).

2.9. County Development Plan

The Galway County Development Plan 2022-2028 was also consulted (www.consult.galway.ie/en/consultation/adopted-galway-county-development-plan-2022-2028). The plan includes policy objectives for the protection of the County's archaeological, architectural and cultural heritage. The Record of Protected Structures (RPS) contained within the plan includes every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the county boundaries (see Figure 1). There are two RPSs within the study area, both of which are also listed in the National Inventory of Architectural Heritage.

3. Archaeological and historical background

3.1. Introduction

The proposed development is located in the townland of Pollboy, in the Electoral Division of Ballinasloe Urban, in the Civil Parish of Kilcloony, in the Barony of Clonmacnowen, in the County of Galway

Pollboy borders the following other townlands:

- Dunlo to the west
- Graigueawoneen to the west
- Kellysgrove to the south
- Moher to the west
- Pollboy to the west
- Portnick to the east
- Suckfield to the east
- Townparks to the north
- Tulrush to the east

The recorded archaeology within approximately 500m of the proposed development lands is shown below in Tables 1-4 (see also Figure 1 and Appendices 1-3).

SMR No	County	Townland	Monument Class	ITM E	ITM N
GA088-046----	GALWAY	POLLBOY	Quarry	584987	729865
GA088-023----	GALWAY	POLLBOY	House - 18th/19th century	585584	730282
GA088-024----	GALWAY	POLLBOY	School	584906	729814
GA088-010001-	GALWAY	DUNLO	Warehouse	585281	730751

Table 1. Recorded archaeological monuments and places within 500m of the proposed development lands (source www.archaeology.ie; see Figure 1 and Appendix 1)

Museum_Ref	Townland	Discovery Circumstances	Rock type
NMI 1937:2803	Kellysgrove	Turf cutting	Porphyry
NMI 1937:2804	Kellysgrove	Turf cutting	Shale
NMI 1937:2805	Kellysgrove	Turf cutting	Shale
NMI 1937:2806	Kellysgrove	Turf cutting	Sandstone
NMI 1958:0014	Pollboy	Unknown	Dolerite?

Table 2. Stone axeheads recorded by the Irish Stone Axe Project within the study area

Excavation no.:	Site name:	Licence No.:	Site type:	ITM:
2001:526	Pollboy	01E0570	No archaeology found	E 585154m, N 729428m
2005:641	Pollboy	A024/4.20	No archaeological significance	E 585619m, N 729667m
2009:394	Dunlo	08E0653	Multi-period: Bronze to Iron Age	E 584807m, N 730374m

Table 3. Recorded archaeological excavations within c. 500m of the proposed development lands (source www.excavations.ie; www.heritagemaps.ie; see Figure 1 and Appendix 2)

NIAH No	RPS No	Original Use	Townland	ITM E	Categories of Special Interest	Date
30333064	3120	Store/warehouse	Dunlo	E. 185279, N. 230735	Architectural, Technical	1825-1835
30408801	2717	house	Pollboy	E. 584908, N. 729815	Architectural, Artistic	1830-1870

Table 4. Recorded architectural heritage sites within c. 500m of the proposed development lands (source www.archaeology.ie; www.buildingsofireland.ie; see Figure 1 and Appendix 3)

3.2. Pre-history (c. 10,000 BC – 500 AD)

There are no recorded archaeological sites or monuments listed in the Record of Monuments and Places dating to the prehistoric period within the study area, but there is evidence of human habitation from this time in the wider area. Five stone axeheads have been recorded from Pollboy (one, circumstances of discovery unknown) and the adjacent townland of Kellysgrove (four, found during turf cutting). Stone axeheads are the single most numerous artefact type surviving from prehistory in Ireland, where they have long been regarded as one of the characteristic objects of the Mesolithic and Neolithic periods (e.g. Woodman 1978; 1987; Cooney and Grogan 1994). More than 21,000 have been recorded by the ISAP since 1991 (Cooney and Mandal 1998).

Development led archaeological investigations in Dunlo townland identified a number of previously unrecorded archaeological features (License no. 08E0653; see Figure 1 and Appendix 2). These comprise a fulacht fiadh (two radiocarbon dates gave dates of 1259–1000 cal BC and 1112–901 cal BC), a burnt spread (dated to 507–386 cal BC), an ironworking site (dated to cal AD 985–1028), and deposits of burnt-stone material (undated). Fulacht fiadh or burnt mounds comprise mounds of charcoal rich soil, heat-fractured stones accompanied by a trough sometimes lined with wooden planks, stone slabs or even clay (Waddell 2000). They are generally located close to water sources including streams, rivers, lakes or marshy ground. The exact use of these sites is still somewhat ambiguous with their traditional interpretation as cooking places coming into question in recent years. They date predominantly to the Bronze Age but date ranges from the Mesolithic period to the medieval period have been returned. These features may be indicative of cooking and/or other related activities.

3.3. Early Medieval (c. 400 – 1100 AD)

The above mentioned ironworking site at Dunlo was radiocarbon dated to the early medieval period (cal AD 985–1028) (see Appendix 2). The site consisted of five pits (Features 1–5). Feature 1 consisted of a large subcircular pit which abutted a large boulder. It was compatible with being a smithing hearth

or a charcoal-making pit, however, the large boulder suggested it might have been employed as an anvil associated with a smithing hearth. Feature 2 consisted of a shallow deposit of dark brownish-black charcoal-enriched sandy clayey silt with frequent charcoal and occasional slag inclusions. Feature 3 consisted of a sub-oval pit which contained a singular fill of mid orangey brown silty sand with frequent charcoal and slag inclusions. This feature may have been a slag pit furnace pit. Feature 4 consisted of a sub-rectangular pit with a single fill of moderately loose black charcoal enriched sandy clayey silt and with frequent slag inclusions, Finally, Feature 5 consisted of a subcircular pit that was filled by loosely compacted mid-brownish-grey silty sandy clay with moderate slag inclusions. This feature may well have been the basal pit of a slag pit iron-smelting furnace, as it contained a small amount of smelting residue. Evaluation of the archaeometallurgical residues from the site concluded that it was most likely to be a small iron-production site where both iron smelting and iron smithing occurred; of that smithing it is likely to be bloom smithing.

Secular habitation sites during this period is characterised by defensive enclosures known as ringforts, which were constructed to protect farmsteads. These are one of the most frequently recorded archaeological site types and c. 50,000 examples are recorded in the Irish landscape. Ringforts are regarded as defended family homesteads and the dating evidence to date suggests they were primarily built between the seventh and ninth centuries AD (Stout 1997, 22–31). There are no recorded ringforts in the study area, but there are 2,621 recorded in the county, including four within c. 2km of the proposed development lands.

3.4. Later Medieval (c. 1150 – 1550 AD)

Ireland was invaded by the Anglo-Norman's in May 1169, with the conquest starting in county Wexford in the southeast. The expansion into Leinster had an impact on the Irish landscape that lasts to this day. Most of the province of Leinster came under Strongbow's control after the conquest. During this period, the Anglo-Normans built castles of stone construction or large flat-topped mounds or mottes with timber structures atop (Harbison 1992) in order to defend their recently acquired lands. By the end of the 12th century Norman settlement was effective over the whole county.

Whilst there is no evidence of habitation dating to this period within the study area, a castle was built in Ballinasloe on the east bank of the Suck in the 12th or early 13th centuries by Turlough O'Connor, then High King of Ireland. This was later rebuilt or expanded by the O'Kellys of Hy-Many in the 14th century. The ruins of the outer wall of this structure remain visible today (Alcock et al 1999).

3.5. Post- Medieval (c. 1550 –)

Taken in the years 1656-1658, the Down Survey of Ireland is the first ever detailed land survey on a national scale anywhere in the world. The survey sought to measure all the land to be forfeited by the Catholic Irish, in order to facilitate its redistribution to Merchant Adventurers and English soldiers. Copies of these maps have survived in dozens of libraries and archives throughout Ireland and Britain, as well as in the National Library of France. This project has brought together all the surviving maps for the first time in over 300 years, digitised them and made them available as a public online resource. The Civil survey 1654-56 lists the townland of Pollboy as follows (see also Figure 2):

Townland of POLLBOY

Down Survey Name:	Charenaclusagh
1641 Owner(s):	Makale, James (Catholic)
1670 Owner(s):	Butler, John (Catholic); Kelly, Bryan McMurtagh (Catholic); Eagon, Edmond (Catholic)
County:	Galway
Barony:	Clon McNowne
Parish:	Killcloony
Unprofitable land:	2 plantation acres

Profitable land:	39 plantation acres
Forfeited:	39 plantation acres

Lewis's Topographical Dictionary of Ireland (1837) describes the town of Ballinasloe as follows:

BALLINASLOE, a market and post-town

Samuel Lewis

A Topographical Dictionary of Ireland

1837

BALLINASLOE, a market and post-town, partly in the parish of CREAGH, barony of MOYCARNON, county of ROSCOMMON, but chiefly in the parish of KILCLOONY, barony of CLONMACNOON, county of GALWAY, and province of CONNAUGHT, 12 miles (W. by S.) from Athlone, and 71 ¾ miles (W. by S.) from Dublin, on the road to Galway; containing 4615 inhabitants. This town is situated on the river Suck, which divides it into two unequal parts, of which the larger is in the county of Galway. It appears to have arisen under the protection of its castle, which in the reign of Elizabeth was one of the strongest fortresses in Connaught, and the ruins of which are situated on the Roscommon side of the river, and is now one of the most flourishing towns in the south and west of Ireland. In 1831 it comprised 632 houses, nearly all slated, of which 265 were built during the ten years preceding. The two portions are connected by a line of two bridges and causeways crossing some small islands, and about 500 yards in length, in which are 16 arches. Here are three tanyards, a flour and three oatmeal-mills, a manufactory for felt hats, a coach-manufactory, two breweries, and a large establishment for curing bacon; and in the vicinity are some quarries of excellent limestone.

An extension of the Grand Canal has been formed within the last few years from Shannon harbour to this town, through the bogs on the south side of the river Suck, which not only affords a regular conveyance for passengers to Dublin and other places, but greatly facilitates the trade of the town. The Ballinasloe Horticultural Society for the province of Connaught was founded in 1833, under the patronage of the Earl of Clancarty, and holds its annual meetings on the first Monday in March; three public shows take place in the year, when prizes are awarded for the best specimens of various kinds of fruit, flowers, and vegetables. The annual meetings of an Agricultural Society are also held here in October. Garbally Park, in the immediate vicinity, is the seat of the Earl of Clancarty, the proprietor of the town: the mansion is situated in a well-wooded demesne, and was rebuilt in 1819; it contains a good collection of paintings, and the public are allowed free access both to the house and grounds.

Near the town, also, is Mackna, the seat of his lordship's brother, the Hon. and Ven. Charles le Poer Trench, D.D., Archdeacon of Ardagh. The market is on Saturday, and is well supplied with corn. The celebrated fair of Ballinasloe is the greatest cattle mart in the kingdom; it is held on the Galway side of the river, from the 5th to the 9th of October. The black or horned cattle are exhibited in an extensive area set apart for the fair outside the town; and a plot of ground in Garbally Park is appropriated to the show of sheep on the day before the fair, when very extensive purchases are made, and those that remain unsold are driven to the fair green. Great quantities of wool were formerly sold, but the establishment of factors in Dublin and other large towns has altered the channel of this branch of trade. The number and variety of goods exhibited for sale render the fair a great resort for all classes of dealers. The number of sheep exhibited in 1835 was 61,632, of which 54,974 were sold; and of cattle, 7443, of which 6827 were sold. Fairs for live stock are also held on May 7th and July 4th; and on the 6th of July there is a large fair for wool, which has been lately revived, and lasts four days: the wool fairs formerly continued from two to five weeks. Petty sessions are held every Wednesday and Saturday in a courthouse attached to the bridewell, an old house not adapted either for confinement or security. This is the head-quarters of the Galway constabulary police; and a company of infantry, for whose accommodation there is a barrack for 56 men, and two companies of cavalry are occasionally stationed here.

The church of the union of Creagh occupies an elevated site in the town. In the R. C. divisions this place is the head of a union or district, comprising the parishes of Kilcloony and Creagh, and containing a chapel in each; that of Kilcloony is situated at the extremity of the market-square. There are places of worship for Primitive and Wesleyan Methodists. Three schools for boys and girls, one for girls only, and an infants' school, are chiefly supported by the Earl of Clancarty, and from other sources, at an expense of about £150 per annum; and there is a national school for both sexes, under the patronage of the R. C. clergyman. The lunatic asylum for the province of Connaught, situated here, was opened in 1833, and is capable of accommodating 150 inmates; it is built of limestone, in the form of the letter X, with a handsome cupola, and the ground attached to it comprises 14 plantation acres enclosed by a wall; the entire expenditure, including cost of building and purchase of site and furniture, was £27,130. 4. 6. Here is also a dispensary, and a Benevolent Society has been formed. The remains of the castle consist of the outer walls only, enclosing a square area, with a round tower in one angle, which has been converted into a neat residence called Ivy Castle, the seat of J. T. Maher,Esq.; the most picturesque portion is a bridge across the fosse to a gateway. The townland of Dunlo, on which the Galway portion of the town is built, gives the inferior title of Viscount to the Earl of Clancarty.—See KILCLOONY and CREAGH.

- https://www.libraryireland.com/topog/B/Ballinasloe-Clonmacnoon-Galway.php

Lewis's Topographical Dictionary of Ireland (1837) describes the townland of Pollboy (Poolboy) as follows:

POOLBOY

Samuel Lewis

A Topographical Dictionary of Ireland

1837

POOLBOY, a village, in the parish of KILCLOONY, barony of CLONMACNOON, county of GALWAY, and province of CONNAUGHT, 1 mile (S. E.) from Ballinasloe: the population is returned with the parish. Here are the ruins of a priory, of which no account is extant; and a school supported by the Earl of Clancarty. On the verge of a bog near the village is a strongly impregnated chalybeate spa, noticed in the article on Kilcloony.

- https://www.libraryireland.com/topog/P/Poolboy-Clonmacnoon-Galway.php

The first edition of the Ordnance Survey map of Ireland, dating to the 1830s depict the land in which the proposed development land is sited in two fields separated by a roughly east-west running ditch (see Figure 3). By the time of the second edition Ordnance Survey map, dating to the early 20th century, little has changed (see Figure 4).

Aerial photography indicates that the proposed development lands were undeveloped and in agricultural land up until 2001—2006, comprising a single field in open pasture (Figure 5). However, by the time of the 2006-2012 editions, the majority of the lands had been part of an open quarry, and the surrounding fields to the east, west and north had been developed (see Figure 6). The land had been reinstated by the time of the 2011-2013 edition (Figure 7), and in more recent times, the land to the southeast had been developed (Figure 8).

4. Archaeological, Architectural and Cultural Heritage Risk

The potential archaeological, architectural and cultural heritage risk at the site can be summarised as follows:

- There are no recorded archaeological site within the proposed development lands.
- There are four recorded archaeological sites within c. 500m of the proposed development lands. None of these sites will be impacted, either directly or indirectly, by the proposed development works.
- Five stone axeheads have been found within the study area.
- There are records of three archaeological excavations in the area in advance of development works, one of which identified archaeological features.
- These indicate that the wider area has been inhabited from at least the Neolithic.
- A desk-top survey of the lands proposed for development, did not highlight any additional, previously unrecorded, archaeological features.
- Cartographic research indicates that the land on which the proposed development is sited has been parkland in open pasture since at least the early part of the 19th century.
- A review of aerial photography indicates that the majority of the proposed development lands were part of a large quarry in the late 2000s / early 2010s.
- However, the northern portion of the proposed development lands do not appear to have been impacted by development in the past.

Therefore, there is potential for previously unrecorded sub-surface archaeological remains to survive within the undisturbed portions of the proposed development footprint.

There are two recorded architectural heritage sites within c. 500m of the proposed development lands, as listed in the National Inventory of Architectural Heritage; both of which are listed in the Record of Monuments and Places. These sites will not be impacted, either directly or indirectly, by the proposed development works.

5. Potential Impact of the Proposed Development

The proposed development will include the excavation of topsoil from the site for the digging of pad foundations and services, up to a depth of c. 1m. As noted above, there is the potential for encountering previously unrecorded archaeological sub-surface remains during the construction phase of the proposed development.

6. Recommended Mitigation Measures

In order to mitigate against the archaeological risks of developing this site, the following is recommended:

6. The appointment of a suitably qualified archaeological consultant to oversee the project at construction phase.
7. The archaeological consultant should consult with the National Monuments Service and the design team, and implement a mitigation strategy, if required, in areas that have not been subjected to significant disturbance in the recent past.
8. This mitigation strategy should consider undertaking geophysical survey and archaeological testing prior to the commencement of the construction phase.

9. Dependent on the results of these surveys, archaeological monitoring of the topsoil strip at construction phase may also be required.
10. Any archaeological features identified during geophysical survey, testing or monitoring in areas where they will be impacted on by the development, will require permission from the National Monuments Service for the excavation (preservation by record) of these remains.

Please note that the recommendations given here are subject to the approval of the National Monuments Service, Department of the Culture, Heritage and the Gaeltacht.

7. References

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Online resources:

- the Irish Stone Axe Project Database (Archaeology Dept., U.C.D.)
- www.archaeology.ie
- www.buildingsofireland.ie
- www.downsurvey.tcd.ie
- www.excavations.ie
- www.heritagemaps.ie
- www.consult.galway.ie/en/consultation/adopted-galway-county-development-plan-2022-2028

Figures

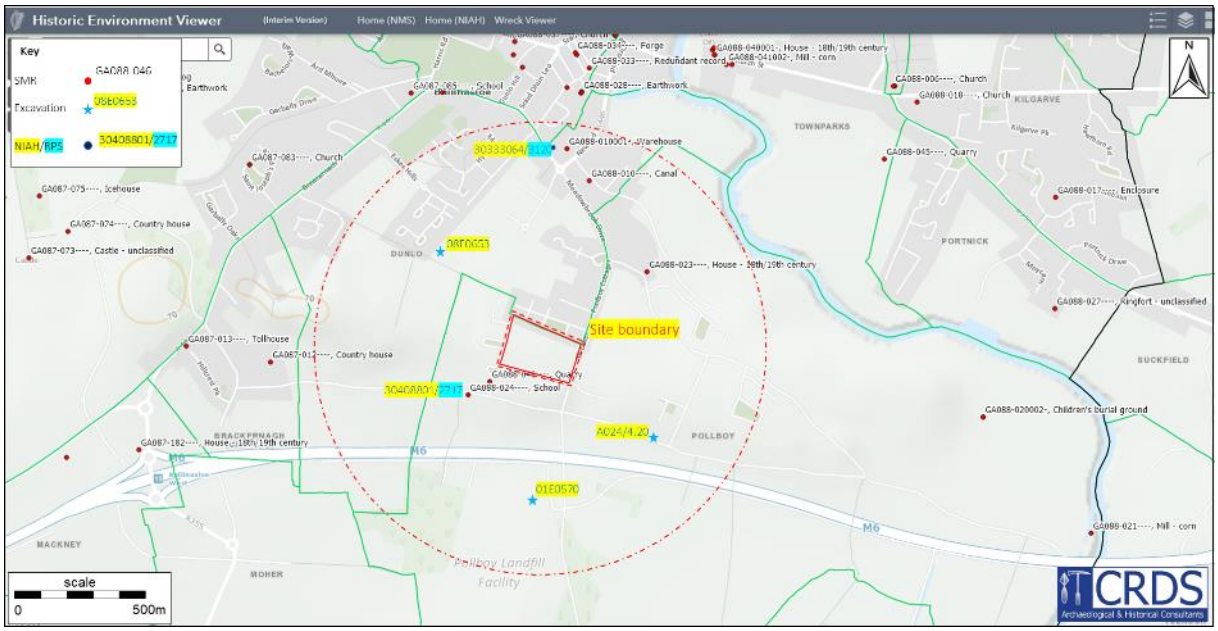

Figure 1. Site location map showing recorded archaeological monuments and places, archaeological excavations and architectural heritage sites within c. 500m of the proposed development lands (source www.archaeology.ie; www.buildingsofireland.ie; www.heritagemaps.ie)

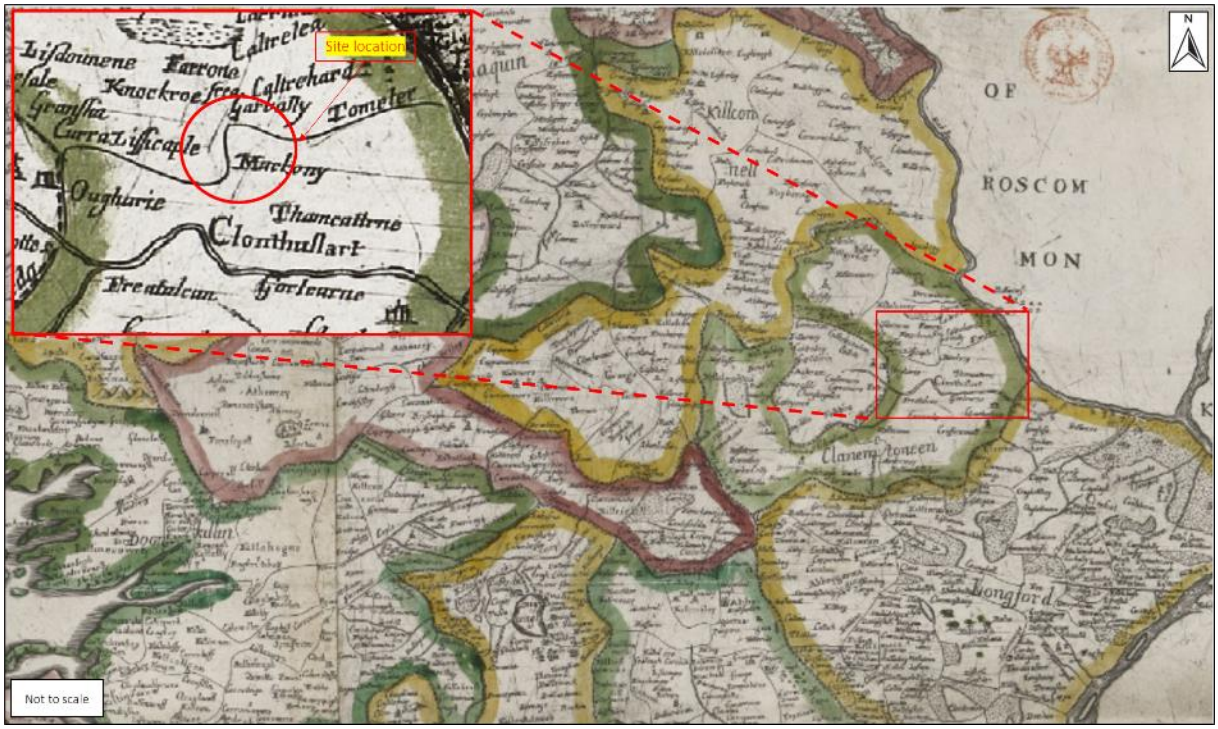

Figure 2. Extract from William Petty's (1660) map of Galway (source www.downsurvey.tcd.ie)

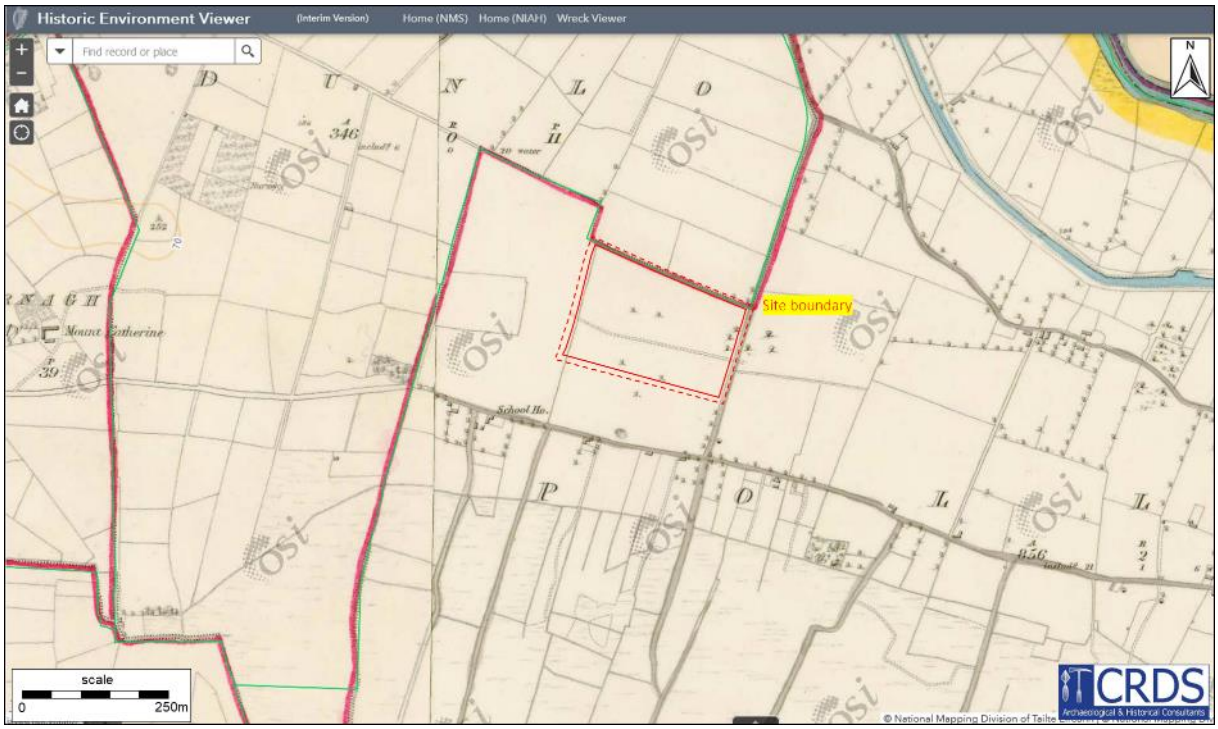

Figure 3. Extract from 1st edition Ordnance Survey map (1830s; source www.archaeology.ie)

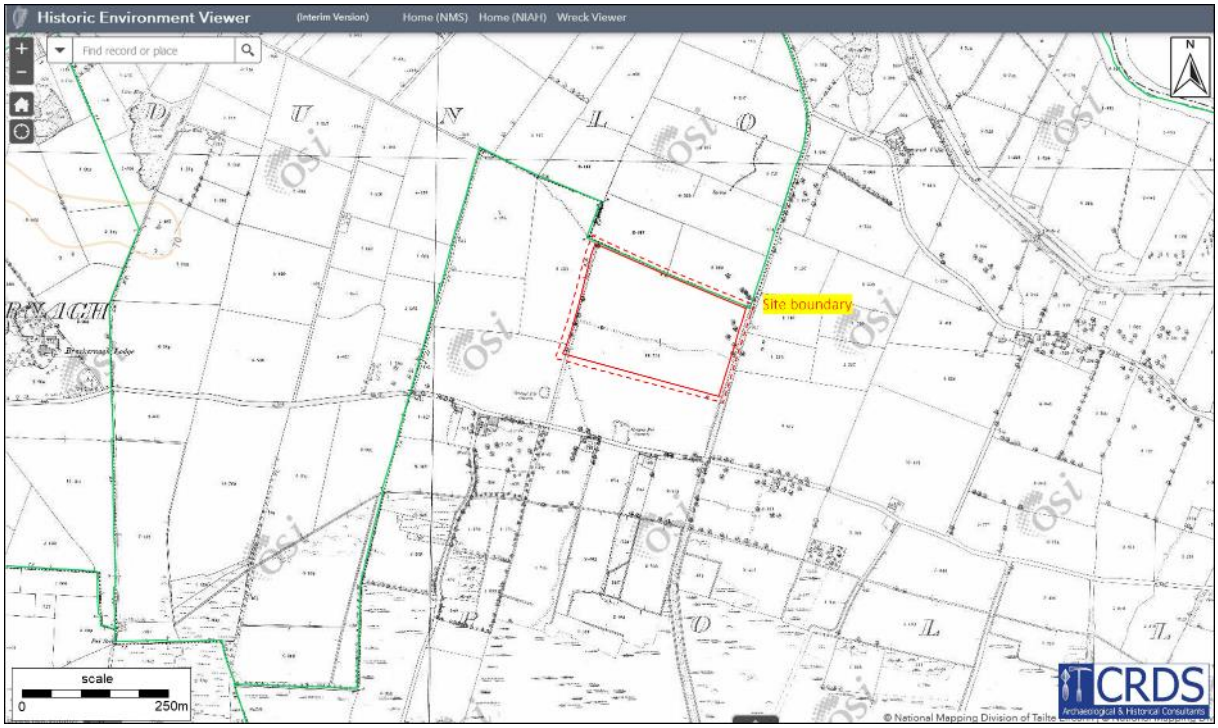

Figure 4. Extract from 2nd edition Ordnance Survey map (1910s; source www.archaeology.ie)

Figure 5. Aerial photograph of the proposed development lands (2001-2006; source www.archaeology.ie)

Figure 6. Aerial photograph of the proposed development lands (2006-2012; source www.archaeology.ie)

Figure 7. Aerial photograph of the proposed development lands (2011-2013; source www.archaeology.ie)

Figure 8. Aerial photograph of the proposed development lands (source www.google.com/maps/place/Pollboy,+Co.+Galway)

Figure 9. Galway County Council Planning Zones (source www.heritagemaps.ie)

Appendices

Appendix 1. Recorded Archaeological Monuments and Places
Appendix 2. Archaeological Excavations
Appendix 3. National Inventory of Architectural Heritage

Appendix 1. Recorded Archaeological Monuments and Places

The recorded monuments and places within c. 500m of the proposed development are listed below, all noted in the Record of Monuments and Places (source www.archaeology.ie).

SMR No.: GA088-010001-
Class: Warehouse
Townland: DUNLO
Description: The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.

SMR No.: GA088-010----
Class: Canal
Townland: CLOONASCRAGH (Longford By.),DUNLO,KELLYSGROVE,POLLBOY
Description: The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.

SMR No.: GA088-023----
Class: House - 18th/19th century
Townland: POLLBOY
Description: The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.

SMR No.: GA088-024----
Class: School
Townland: POLLBOY
Description: The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded.

SMR No.: GA088-046----
Class: Quarry
Townland: POLLBOY
Description: "A hachured feature marked on the 1945 revision of the OS 6-inch map proved on inspection in 1985 to be a disused gravel pit. Compiled by: Olive Alcock Date of upload: 23 July 2014

Appendix 2. Archaeological Excavations

The excavation bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2022.

Excavation no.:	**2001:526**
Site name:	POLLBOY
SMR No.:	N/A
Licence No.:	01E0570
Author:	Sue Zajac
Site type:	No archaeology found
Period/Dating:	N/A
ITM:	E 585154m, N 729428m
Description:	Monitoring was carried out as part of an extension to the Ballinasloe Landfill Site. A bund wall, under construction, required the bulk extraction of peat to a depth of c. 3m. The bund wall was c. 3m wide and a 150m stretch was completed during the early stages of this development. Monitoring uncovered no archaeological features or deposits. 1 Chapel Lane, Killala, Co. Mayo

Excavation no.:	**2005:641**
Site name:	POLLBOY
SMR No.:	N/A
Licence No.:	A024/4.20
Author:	Julianna O'Donoghue, Eachtra Archaeological Projects, Ballycurreen Industrial Estate, Kinsale Road, Cork.
Site type:	No archaeological significance.
Period/Dating:	—
ITM:	E 585619m, N 729667m
Description:	The assessment, including test excavation, was carried out before the construction of the proposed N6 Galway–Ballinasloe road scheme. The proposed scheme will be a dual carriageway, 56km in length, extending from the east side of Galway city at Doughiska to the east side of Ballinasloe, at Beagh Brabazon, in Co. Roscommon. The assessment was undertaken for Galway County Council and the National Roads Authority and forms part of a wider archaeological assessment of c. 15km of the proposed N6 dual carriageway (Contract 4). Thirty-four test-trenches were excavated in six fields. In the geophysical survey (ArchaeoPhysica 2004) cultivation furrows in Field 194 and a scatter of debris due either to the presence of buried archaeology or boulders in Field 197 were detected. Neither of these features was identified during the excavation of test-trenches. No features or artefacts of archaeological significance were uncovered in any of the trenches excavated.
Reference	ArchaeoPhysica 2004 N6 Galway to East Ballinasloe geophysical survey report. Unpublished report lodged with the DoEHLG.

Excavation no.:	**2009:394**
Site name:	Dunlo
SMR No.:	N/A
Licence No.:	08E0653
Author:	Tamlyn O'Driscoll, Moore Archaeological & Environmental Services Ltd, Corporate House, Ballybrit, Galway.
Site type:	Various
Period/Dating:	—
ITM:	E 584807m, N 730374m
Description:	Excavation and monitoring was carried out in Dunlo townland, Ballinasloe, Co. Galway, between March and April 2009. The work was undertaken for Precision Construction Ltd on behalf of Tesco Ireland Ltd. The development was close to a number of monuments, a post-medieval canal, associated buildings and features (GA088–010) and the site of an enclosure (GA088–028).

An assessment and geophysical survey were sought in advance of a planning application for the proposed development.

A previously unrecorded archaeological site was discovered in Field No. 7. A programme of testing was recommended throughout the entire site to include specific anomalies identified in the geophysical survey. The anomaly identified was confirmed to be a burnt mound. Full excavation of the fulacht fiadh (Site 1) was undertaken in tandem with a programme of monitoring of topsoil-stripping across the entire development site. During the course of monitoring three additional sites of archaeological interest were uncovered, an ironworking site (Site 2), deposits of burnt-stone material (Site 3) and a burnt spread (Site 4). Each of these additional sites were fully excavated.

Site 1, fulacht fiadh

Excavation of the fulacht fiadh was conducted between March and April 2009 and revealed a large subcircular mound with frequent burnt stone, ash and charcoal-enriched soil which measured 21.5m north–south by 18.6m wide and 0.8m deep. Several layers of burnt-mound material were identified; the main deposit (Context 3) comprised moderately compacted greyish-black sandy silt with much burnt stone and charcoal which measured 10m north–south by 10m wide and 0.6m deep. The stones comprising Context 29 were notably larger and less fragmentary than those in Context 3. Context 29 may represent a different phase, perhaps a supply of stones that were stored to be reused in the trough at a later stage.

Occasional deposits of peat and clay were visible in the sections over and above these mound fills, which suggested that there were periods when the site, or areas of the site, was not in use, thus allowing the peat to form.

Several additional features were uncovered including cultivation furrows which traversed the top of the mound in an east to west orientation. Most notable amongst these was Feature 4, a sub-oval pit filled with dark-brown silt with much burnt stone and moderate amounts of charcoal. The fragmented corroded remains of a possible iron blade were found in the pit. Feature 4 measured 3.2m north–south by 1.5m wide and 0.27m deep. The trough feature was found directly below this pit.

The trough consisted of a subrectangular-shaped wooden structure measuring 2.85m south-west to north-east by 1.5m wide and 0.55m maximum depth. The trough was constructed of horizontally placed rods which were held in place at intervals by weaving them around vertical wooden stakes, with the worked end driven into the ground. The rods measured between 2m and 0.3m in length. In between the horizontally placed rods were twigs and a matrix of dark-black fine-grained silt. The north-eastern interior wall of the trough structure was intricately constructed of horizontally interweaving rods and sails to form a basket-like lining. At the southwestern end of the trough was a large horizontally placed flat piece of timber 2.25m in length, 0.24m wide and 0.05m. This piece may have acted as a shelf or possibly as a step; it may also have functioned as an additional support for the south-western end of the structure that did not survive well and collapsed under the weight of the surrounding gley. The southwestern end of the trough was also constructed of interweaved rods and sails similar to the corresponding north-eastern end. Some pieces of wood lining had evidence of charring and there were occasional randomly found pieces that had worked ends. The trough was filled with moderately compacted mid-grey material of burnt stones, fine grained silt and charcoal.

The structure was contained within a large subcircular cut that had been dug into the surrounding gley natural and measured 3.8m north–south by 3.75m wide and 1m deep. The sides of the pit were gradually sloped and stepped in profile on all sides. The base was subrectangular shaped and relatively flat; it measured 2.2m southwest to north-east by 1.5m wide. The trough frequently filled with groundwater. Some moss lining was present in-between interweaved wood that lined the north-eastern interior of the trough. There was no wood lining the base of the trough.

Surrounding the area where the trough was located a deposit of heavily compacted light-yellow clay had accumulated which measured 10m west–east by 4m wide and had a maximum depth of 0.25m. This was likely to be upcast material resulting from digging of the trough pit, which was subsequently deposited in the vicinity. Radiocarbon dating of a sample of charcoal from mound material dated the fulacht fiadh to 1259–1000 cal BC. A further charcoal sample taken from the basal fill of the trough dated the feature to 1112–901 cal BC.

Site 2, ironworking site

Site 2 was identified during monitoring of topsoil stripping south-west of the site compound where a proposed topsoil storage area was located. The overall excavation area measured 10m east–west by 4.5m wide. The site consisted of five pits (Features 1–5) excavated into the surrounding mid-orange sandy boulder clay. Feature 1 consisted of a large subcircular pit which abutted a large boulder. It measured 1.35m north–south by 0.95m wide, and had a maximum depth of 0.18m. The fill consisted of 0.15m depth of moderately loose light-brown sandy clayey silt with moderate charcoal and slag inclusions, which overlay 0.03m of moderately compacted charcoal-enriched silt with occasional small pebbles. The cut of the pit was shallow with gently sloping sides and a flat base. Feature 1 was compatible with being a smithing hearth or a charcoal-making pit. However, the large boulder suggested it might have been employed as an anvil associated with a smithing hearth.

Feature 2 consisted of a shallow deposit of dark brownish-black charcoal-enriched sandy clayey silt with frequent charcoal and occasional slag inclusions which was contained within a shallow irregular shaped cut. It measured 1m north-east to south-west by 0.3m wide and 0.1m deep. Feature 3 consisted of a sub-oval pit which contained a singular fill of mid orangey brown silty sand with frequent charcoal and slag inclusions. It measured 0.7m north–south by 0.42m wide and 0.12m deep. This feature may have been a slag pit furnace pit.

Feature 4 consisted of a subrectangular pit with a single fill of moderately loose black charcoal enriched sandy clayey silt and with frequent slag inclusions, contained within a steep-sided slightly concave-shaped cut that measured 1.25m north-west to south-east by 0.65m wide and 0.15m deep. It contained a large amount of smithing waste and, similar to Feature 2, both features were likely to have had smithing material enter the cuts on abandonment. Both features may have been charcoal making pits supplying the two smelting furnaces (Features 3 and 5).

Feature 5 consisted of a subcircular pit that was filled by loosely compacted mid-brownish-grey silty sandy clay with moderate slag inclusions and contained within a gently sloping cut with an uneven base. It measured 0.56m east–west by 0.53m wide.

This feature may well have been the basal pit of a slag pit iron-smelting furnace, as it contained a small amount of smelting residue. Radiocarbon-dating of a sample of charcoal from the upper fill of Feature 1 dated the site to cal AD 985–1028. Evaluation of the archaeometallurgical residues from the site concluded that it was most likely to be a small iron-production site where both iron smelting and iron smithing occurred; of that smithing it is likely to be bloom smithing. No assemblage of smithing floor material from bloom smithing has been previously examined in detail in Ireland.

Site 3, deposits of burnt-stone material

Site 3 was identified during monitoring of topsoil stripping north-west of the fulacht fiadh (Site 1). Site 3 consisted of two features, both of which consisted of subcircular deposits of burnt-stone material 1m apart which lay below up to 1m of overlying topsoil and peat. The overall excavation area measured 4m north–south by 3.5m wide. Feature 1 consisted of loose mid-greyish-brown peat with moderate charcoal and ash inclusions, as well as many small burnt-stone fragments. It measured 1.5m north–south by 1.32m wide and 0.12m deep. Feature 2 consisted of a deposit of loose mid-grey/dark-brown peat with moderate charcoal and frequent small burnt stones. It measured 1.4m north west/south-east by 0.95m wide, and 0.1m deep. There were no visible cuts for either feature and no obvious function for their use.

Site 4, burnt spread

Site 4 was identified during monitoring of topsoil stripping at the base of a gentle slope, in marginal land c. 25m south of the peaty wetland location of the fulacht fiadh. It consisted of an irregular-shaped spread of material comprising frequent small firecracked stones in a charcoal-enriched clayey silt matrix. Overlaying the burnt spread was 0.4m of topsoil and silty clay with frequent inclusions of modern glass shards, pottery sherds and fragments of corroded metal.

The spread (Feature 1) was composed of primary material which measured 15.6m east–west by 8.75m wide and had a maximum depth of 0.2m. It consisted of moderate to firmly compacted mid-greyish-black soil which comprised 80% burnt-stone fragments and grains and 20% sandy

silt with frequent charcoal inclusions. The site was heavily truncated by modern cultivation furrows, field boundaries and drains which traversed the site in an east to west orientation.

A large field boundary (Feature 2) truncated the site and consisted of medium sub-angular and subrounded stones contained within a shallow U-shaped cut within a mid-brown clay matrix. It measured 12m east–west by 1.75m wide and 0.4m deep. A stone filled drain (Feature 3) truncated the site in a north–south direction and measured 5m north–south by 0.45m wide and 0.2m deep. This drain abutted

Feature 2, suggesting that both features were contemporary. Similar stone-filled drains also traversed the nearby fulacht fiadh and the surrounding fields. A large sub-oval pit (Feature 4) was located towards the centre of the burnt spread. It contained three overlying fills within a steep-sided cut with a concave base. The pit measured 1.7m east–west by 1.5m wide and 0.55m deep. The various fills had moderate to frequent burnt stone and charcoal inclusions. The pit filled with groundwater during excavation. It may have been a former trough feature. Radiocarbon-dating of a sample of charcoal from the main mound context dated the site to 507–386 cal BC.

Appendix 3. National Inventory of Architectural Heritage

The recorded archaeological sites within c. 500m of the proposed development are listed below, all noted in the National Inventory of Architectural Heritage (NIAH) (www.archaeology.ie; www.buildingsofireland.ie/).

NIAH No.	**30408801**
RPS No.	**2717**

Name	**Beechlawn House, POLLBOY, Ballinasloe, GALWAY**
Original Use	house
In Use As	house
Townland	Pollboy
ITM E.	584908
ITM N.	729815
Rating	Regional
Cat of Spec Int.	Architectural, Artisitc
Date From	1830
Date To	1870
Description	Detached three-bay single-storey house, built c.1850, having four-bay north elevation, and recent flat-roofed extension to rear (west) elevation. Hipped slate roof with catslide roof to rear, and rendered chimneystacks. Rendered walls having panelled pilasters to ends of front façade and flanking entrance bay. Square-headed window openings with tripartite six-over-six pane timber sliding sash windows to front elevation, and replacement uPVC windows to other elevations, all with painted sills. Segmental arch to recessed porch with timber panelled door to inner wall having carved timber pilasters with consoles and cornices, flanked by stained-glass sidelights with timber panels below, and teardrop fanlight. North gable end directly onto roadside. Lawn to front with rendered boundary walls.
Appraisal	This classically proportioned villa forms an impressive feature in the landscape. The porch, doorcase and fanlight are well crafted and add artistic interest, creating a focal point to the façade. The building retains notable features such as the timber Wyatt sliding sash windows.

NIAH No.	**30333064**
RPS No.	**3120**

Name	**Harbour Road, DUNLO, Ballinasloe, GALWAY**
Original Use	Store/warehouse
In Use As	-
Townland	Dunlo
ITM E.	185279
ITM N.	230735
Rating	Regional
Cat of Spec Int.	Architectural, Technical
Date From	1825
Date To	1835
Description	Detached seven-bay three-storey former canal warehouse, built c.1830. Now derelict. Pitched slate roof having cut-stone eaves course, with kneelers to gables, and cast-iron rainwater goods. Coursed rubble limestone walls. Square-headed window openings to long walls with replacement timber windows, all with stone sills. Square-headed vehicular entrance with raised block-and-start cut limestone surround. Square-headed pitching door opening to first floor with yellow brick block-and-start surround, cut-stone sill and timber sheeted door. Round-headed opening to north-west gable, over square-headed opening to ground floor, with raised cut-stone block-and-start surrounds to both. Detached sixteen-bay two-storey former canal warehouse, built c.1830 to east of site, having pitched slate roof with raised gablets to two full-height openings having corbelled-out cut-stone arches. Snecked dressed limestone walls with later fenestration having replacement uPVC windows, and some original blocked up window openings having dressed stone surrounds and voussoirs. Square-headed door openings with timber panelled doors.
Appraisal	A former canal warehouse and ancillary building retaining much original form and structure. The solidly constructed complex is enlivened by the varied door surround and other dressed limestone details which make an aesthetically interesting textural contrast with the rubble walling. The site serves as a reminder of the area's history of canal transport.

APPENDIX D

GROUNDWATER ABSTRACTION FEASIBILITY ASSESSMENT

PREPARED BY MCCLOY CONSULTING

McCloy Consulting

Groundwater Abstraction Feasibility Assessment

Pollboy, Ballinasloe

M02220-01_ENV01 | August 2023

WATER & ENVIRONMENTAL CONSULTANTS

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1 INTRODUCTION

1.1 Terms of Reference

This Groundwater Abstraction Feasibility Assessment report was commissioned by John Sisk & Son Ltd to assess the feasibility of installing a groundwater production well at the site of a proposed residential development in Ballinasloe, County Galway.

1.2 Objectives

The objective of the Groundwater Abstraction Feasibility Assessment is to evaluate the technical feasibility of establishing a private groundwater supply at the site that will meet the water demand of the proposed residential development.

1.3 Statement of Authority

This assessment has been prepared and reviewed by qualified professions with appropriate experience. The key staff members involved in this project are as follows:

- Erin Galbraith *BSc MSc* – Geo-environmental Consultant experienced in contaminated land risk assessments, geo-environmental investigations, and groundwater assessments.
- Richard Thompson *BSc PGeo EurGeol* – Principal Geologist/Environmental Engineer experienced in a wide range of environmental management and risk assessment experience, including hydrogeological modelling geochemistry expertise in subsurface contamination investigations, and contaminated land assessment and remediation.

1.4 Scope of Works

The scope of works for the assessment includes the following:

- Assessment of geological and hydrogeological setting: Review of published and on-line geological and hydrogeological maps and records to inform the environmental setting of the site and its surrounds.
- Groundwater resource availability: Groundwater feasibility will be evaluated through a review of abstraction yields and water quality records and will aim to identify any quantity and/or quality restrictions by identifying local groundwater contamination risks and the presence of other licenced abstractions proximal to the site.
- Trial well design: A preliminary trial well design to be produced.
- Abstraction Licensing and Regulations: Guidance will be provided on abstraction licensing to ensure the operator is fully aware of its legal responsibilities.
- Drinking water classification legislation and guidance.

2 SITE DETAILS

2.1 Site Location and Description

The site (centroid Irish Grid M 85382 29981) is located off Poolboy Cottages, Ballinasloe, Co Galway and currently a vacant field with vegetation. A site location map is included in Appendix A.

Land within the site generally falls from west to east with ground levels varying between approximately from 53.7mOD in the southwestern portion of the site to 47.1mOD in the eastern boundary of the site.

Figure 2-1: Site Location

2.2 Projected Water Supply Provisions

The proposed development is for 92 housing units with 4no. people per unit, totalling 368 people. Based on the Irish water calculated demand of 130 litres per person per day the water demand would be 50,000 l/d. Proposed development plans are included in Appendix B.

3 SITE SETTING AND GROUNDWATER RESOURCE POTENTIAL

3.1 Geological Setting

3.1.1 Subsoils

A review of GeoHive National Geospatial Data Hub Map Viewer [1] (1:40,000 scale) indicates the subsoil beneath the site is by Carboniferous limestone till (diamictons). A figure showing the extent of each subsoil categories is shown in Figure 3-1.

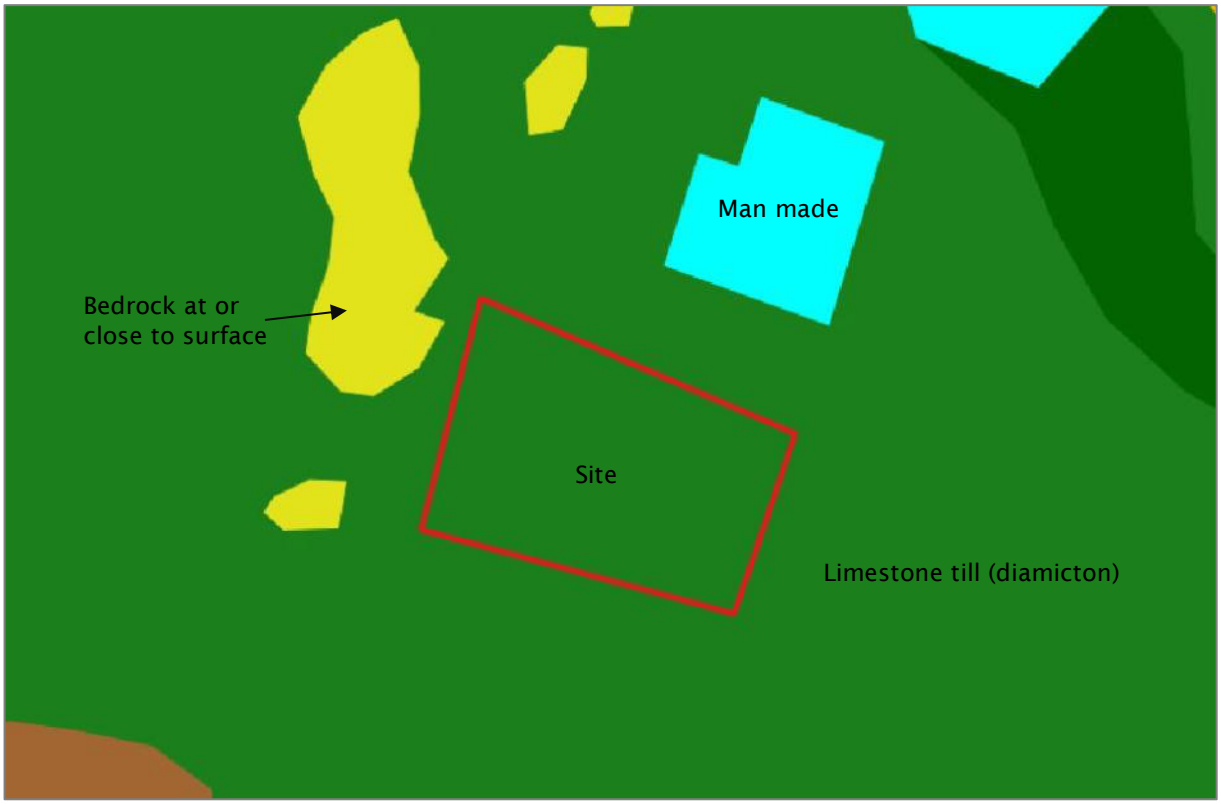


Figure 3-1: Subsoils (Teagasc, EPA and GSI, 2023)

3.1.2 Mapped Solid Geology

A review of the published geological mapping (GSI) 1:100,000 scale indicates the site is underlain by Carboniferous Visean Limestones, which is described as undifferentiated limestones. This bedrock is defined as undifferentiated due to lack of drilling information. c.90m south of the site is Lucan Formation, which is comprised of dark limestone and shale.

The Visean Limestones are comprised of 3no. formations in southeast Galway County, the top formation is Burren, followed by Lucan and Tubber. The maximum thicknesses of the formations: Burren Formation is >244m; Lucan Formation is >733m; and Tubber Formation is c.102m [2].

An overview of the bedrock geology is presented in Figure 3.2 overleaf.

[1] Geological Survey Ireland Spatial Resources Map Viewer.
https://webapps.geohive.ie/mapviewer/index.html

[2] Pracht and Somerville. Journal of Palaeogeography, 2015. A revised Mississippian lithostratigraphy of County Galway (western Ireland) with an analysis of carbonate lithofacies, biostratigraphy, depositional environments and palaeogeographic reconstructions utilising new borehole data

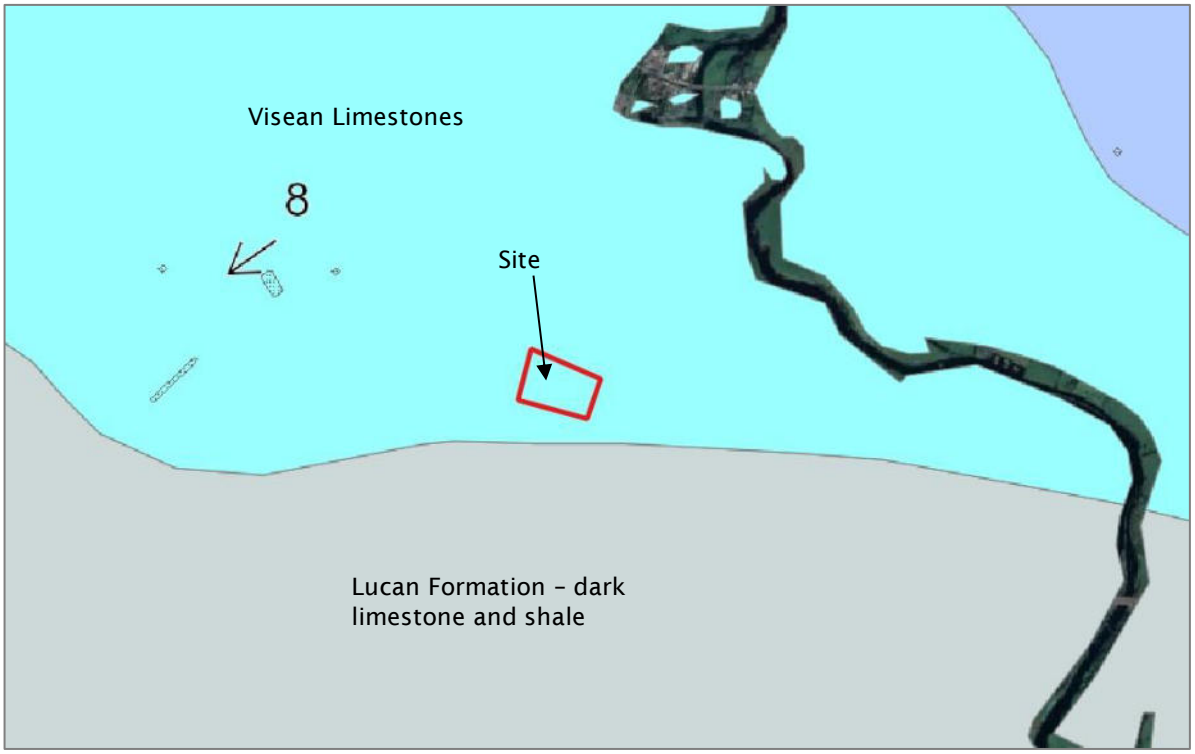


Figure 3-2: Bedrock Geology Map (1:100,000 scale)

3.1.3 Borehole Records

A review of GSI Spatial Resources indicates that 4no. verified boreholes are located within 2km radius of the site boundary:

Table 3-1: GSI Verified Borehole Records

Borehole ID	Year Drilled	Length/m	Depth to bedrock/ m	Approx. distance from site	GSI Bedrock 1:100k
2316	April 1995	31	24.5	0.8km southeast	Lucan Formation
2751	April 1995	22	11.5	1.0km southeast	Lucan Formation
309	April 1994	682	6	1.25km west	Visean Limestones
1442	-	20.5	2	1.91km northwest	Visean Limestones

Verified borehole records contain borehole logs related to each borehole ID and is summarized below and included in Appendix C:

Borehole ID 2316:

- 0 - 24.50m – Sandy overburden.
- 24.50 – 31m – Shelf reef (calp), moderate shaley with non-shelf marl fossiliferous and coarsening upwards cycles.

Borehole ID 2751:

- 0 – 11.5m – Peat and Sand.
- 11.5 – 13.3m – Shelf material, crinoidal odal grainstones, very fossiliferous and medium-coarse grained.

- 13.3m – 22m – Dense calp and less fossiliferous.

Borehole ID 309 (record is poorly legible, but confirmed text is included below):

- 0 – 6m – Overburden.
- 6m – 89m – Shelf limestone.
- 89m – 92.8m – Top of Waulsortian Limestones
- 92.8m – 652m - Waulsortian Limestones with occasional crinoids. Layers of calcarenite, micrite and stromatactics.
- 652m – 657m – Base of Waulsortian Limestone
- 657m – 682m – Argillaceous bioclastic limestone.

Borehole ID 1442:

- 0 – 2m – Overburden.
- 2m – 20.5m – Light to medium grey, Crinoidal shelf Grainstone. Medium to coarse grained with some stylolites. Very uniform.

3.2 Hydrogeology

3.2.1 Superficial Hydrogeology

There is no mapped sand and gravel aquifer on or within 250m of the site.

3.2.2 Bedrock Hydrogeology

3.2.2.1 Aquifer Characteristics

A review of the available online GSI Groundwater Data Viewer database indicates the underlying bedrock has been mapped as Carboniferous Visean Limestones.

The aquifer beneath the site is a bedrock aquifer is comprised of Dinantian Pure Bedded Limestones, which is described as a **Regionally Important Aquifer – Karstified (conduit) (Rkc)** which is productive in regional zones. The aquifer is further described as an aquifer in which the degree of karstification determines the potential to develop groundwater.

The Suck South Groundwater Body (GWB) is described as karstic according to the EPA Water Map Viewer[3]. Suck South GWB has a Water Framework Directive (WFD) overall groundwater status (2016-2021) of '**Good'** and listed as '**Not at Risk'** (WFD Risk 3rd Cycle).

There is no mapped sand and gravel aquifer on or within 250m of the site.

3.2.2.2 Groundwater Vulnerability

GSI provides a methodology for aquifer classification based on resource value (Regionally Important, Locally Important and Poor) and vulnerability (Extreme, High, Moderate or Low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils). The groundwater vulnerability beneath the site is subdivided into different vulnerability classifications as shown in Figure 3-4. Majority of the site is in a **High** vulnerability area. The northwestern boundary of the site is **Extreme** vulnerability area, and then in the northeastern corner of the site is a **Moderate** vulnerability area.

[3] EPA Water Map Viewer. https://gis.epa.ie/EPAMaps/Water

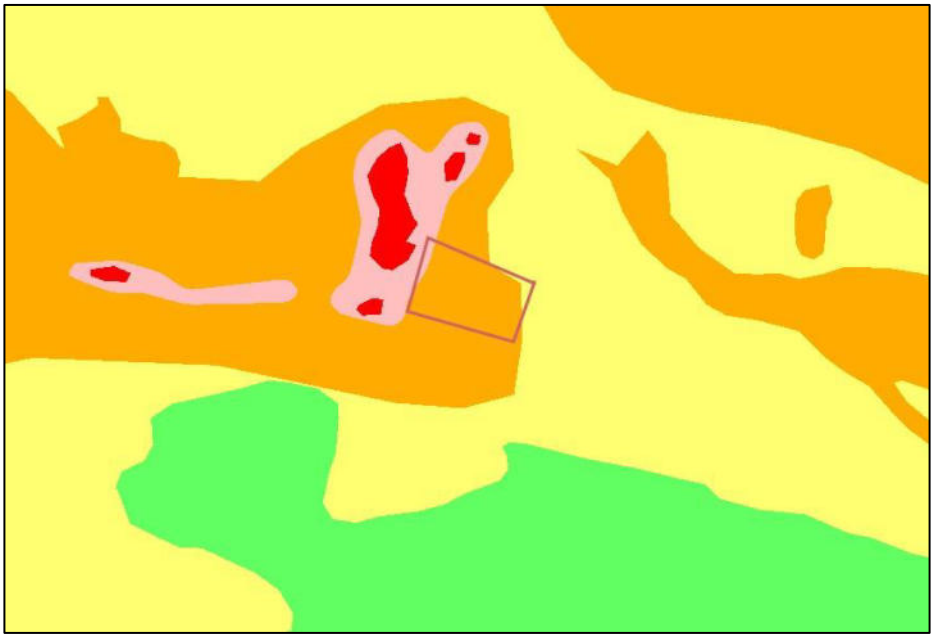


Figure 3-2 GSI Groundwater Vulnerability (GeoHive, 2022)

3.2.3 Groundwater Recharge

Diffuse recharge generally occurs via rainfall percolating through the subsoil being higher in areas where subsoil is thinner and/or more permeable. The proportion of the effective rainfall that recharges the aquifer is largely determined by the thickness and permeability of the soil and subsoil, and by the slope.

The GSI's groundwater recharge model parameters for the site are summarised in Table 3-2. There are three separate recharge parameters for the site.

Table 3-2: Groundwater Recharge Parameters

Majority of the site	
Average Recharge (mm/yr)	347.43
Hydrogeological Setting:	2.v
Hydrogeological Setting Description:	M Vul: Moderate permeability subsoil overlain by well-drained soil
Subsoil Type:	Tls
Subsoil Description:	Till derived chiefly from limestone
Subsoil Permeability	Moderate
GW Vulnerability:	High
Aquifer Category:	Rkc
Aquifer Category Description:	Regionally Important Aquifer – Karstified (conduit)
Rock Unit:	Dinantian Pure Bedded Limestones

Recharge Coefficient (%):	60.00
Effective Rainfaill (mm/yr):	579
Northeastern corner of the site	
Average Recharge (mm/yr)	347.43
Hydrogeological Setting:	3.i
Hydrogeological Setting Description:	M Vul: Moderate permeability subsoil overlain by well drained soil
Subsoil Type:	Tls
Subsoil Description:	Till derived chiefly from limestone
Subsoil Permeability	Moderate
GW Vulnerability:	High
Aquifer Category:	Rkc
Aquifer Category Description:	Regionally Important Aquifer – Karstified (conduit)
Rock Unit:	Dinantian Pure Bedded Limestones
Recharge Coefficient (%):	60.00
Effective Rainfaill (mm/yr):	579

3.2.4 Groundwater Subsoil Permeability

A review of the GSI groundwater subsoil permeability datasets indicates that the subsoils underlying the site are classed as 'Moderate Permeability'.

3.2.5 National Soils Hydrology

A review of the National Soils Hydrology map indicates that the subsoils underlying the site are classed as 'Well drained'.

3.2.6 Groundwater Drinking Water Protection Areas

A review of the GSI groundwater drinking water protection areas indicate there are no protected areas within 2km of the site.

3.2.7 Groundwater Karst Data

There are no groundwater karst features mapped within 3km of the site. The Visean Limestones have the potential to be locally karstified in discrete locations.

3.2.8 Hydraulic Properties

3.2.8.1 Bedrock Geology

Following a review of Borehole ID 309 (Section 3.1.3), GSI Bedrock (1:100k), and Pracht and Somerville - Journal of Palaeogeography (2015), we can conclude that bedrock beneath the site could be a variety of different formations. This assessment has included the bedrock encountered at depth in Borehole ID 309 (Waulsortian) and Pracht and Sommerville's research of Visean Limestone stratigraphy of Burren Formation, Lucan Formation and Tubber Formation. It is to note that Visean Limestones do not have their own specific hydraulic properties due to the reasons mentioned in Section 3.1.3. In leu of hydraulic studies completed in the site and surrounding area, a more regional approach is used to estimate the hydraulic properties of these bedrock formation aquifers.

3.2.8.2 Waulsortian Limestones

A review of Tedd et al (2008)[4] states that groundwater flow will be dominated by fracture flow networks. Typically, hydraulic conductivities decline with depth as fractures become tighter and less common. However, in areas where these limestones are dolomitised, there may be permeable zones at greater depth. A review of Table 5.1 within Tedd et a. (2008) indicates that typical well yields for wells exploiting the Waulsortian Limestones in South Eastern River Basin District (SERBD) can range from 300 – 3,000m³/day, with a typical yield of 1,000m³/day.

This translates to a range of 12.5 – 125m³/hr, with a typical yield of c.42m³/hr.

3.2.8.3 Visean Karstified Limestones

A review of Tedd et al (2008) of karstified limestones in the Visean Limestone group in SERBD is used as a comparative analysis of the hydraulic properties of the Visean Karstic Limestones at the site due to lack of hydraulic studies done in the site and surrounding area.

A review of Table 5.1 within Tedd et a. (2008) indicates that typical well yields for wells exploiting the Visean Karstified Limestones can range from 10 – 2,000m³/day, with a typical yield of 225 - 400m³/day.

This translates to a range of 0.4 – 83m³/hr, with a typical yield of 9.4 – 16.6m³/hr.

3.2.9 Local Groundwater Abstractions

The following regulatory bodies, local authorities, and publicly available databases were consulted for information on groundwater abstractions:

- Environmental Protection Agency, Ireland – information on any groundwater abstractions over 25m³/day.
- Geological Survey Ireland – information on any public groundwater abstractions.
- Galway County Council – Records of any private water supplies used for private domestic use.
- Irish Water – information on any public groundwater abstractions.

A copy of all relevant correspondence is provided at Appendix D.

Environmental Protection Agency Ireland register contains information on water abstraction of 25 cubic meter or more per day and was last updated in August 2023. A review of the August 2023 register indicated 1no. groundwater abstractions within 5km of the site and is detailed in Table 3-3 below.

[4] Environmental Protection Agency (2020), Publications, Research, Water: Review of groundwater-level data in the SERBD. Available from https://www.epa.ie/pubs/reports/research/water/kteddinterim/tedd-report-erc-17-chapter-5.pdf

Table 3-3: EPA Water Abstraction Points

Registration Number	Abstraction Source	Primary Use	Yield (m^3/d)	Approx. distance from site
R2471-01	Groundwater well/borehole	Irish Water - Waste Water Treatment	25	c.550m northeast

Irish Water was contacted on 21 August 2023 about the two listed EPA water abstractions (both for public supply) listed in the EPA register with no location information provided. As of the time of the submission of the report, there has been no response in relation to groundwater abstractions.

Galway County Council was conducted on 21 August 2023 about any groundwater abstractions within 5km of the site. Galway County Council have not responded in time of issue of this report.

A review of GSI Spatial Resources database identified 3 no. groundwater wells and springs within a 2km radius of the site boundary. It is noted that yield productivity is recorded as either good and / or moderate within closest proximity to the site as shown in Table 3-6 below.

Table 3-4: GSI registered Groundwater wells and springs

Well ID	Drill Date	Depth to hole (m)	Depth to rock (m)	Source Use	Yield Class	Yield (m^3/d)	Approx. distance from site	GSI Bedrock (1:100k)
1721NEW013	August 1998	31.3	22	Other	-	-	c.0.8km south	Lucan Formation
1723SEW039	December 1969	33.8	8.2	Agricultural and domestic	Moderate	49.1	c.1.6km northeast	Visean Limestones and Waulsortian Limestones
1723SWW003	March 1963	22.9	9.1	Agricultural and domestic	Good	152.6	c.1.8km northwest	Visean Limestones and Lucan Formation

3.2.10 Groundwater Quality

A review of the Environmental Protection Agency Ireland database in accordance with the WFD Groundwater body status 2016-2021 records the Suck South groundwater body classification as "Good". Further review states the chemical and quantitative groundwater status for 2016-2021 of Suck South GWB is also "Good".

A review of the quality of EPA's Drinking Water Audit Report for County Galway (April 2019) at Ballinasloe Water Treatment plant, states the Ballinasloe public water supply is taken from the Bunowen River about 30m north of the confluence with River Suck. There is no information regarding the public water supply coming from groundwater resources or its quality.

No water quality data is available for review.

It is recommended that site specific groundwater samples are collected and tested to confirm and characterise local water quality. Results should be screened against the drinking water quality standards to confirm potable (drinking) water quality.

3.3 Indicative Groundwater Potential

3.3.1 Limestone Bedrock Aquifer

Very little data is available pertaining to the potential for significant groundwater flow at the site. Using the nearby deep borehole (ID 309) which is located at a similar elevation compared to the site at 62mOD to

53moD (site), we can estimate the proposed depths of the bedrock to be encountered to abstract from either limestone aquifer (Visean or Waulsortian).

The Visean Undifferentiated Limestones are mapped on site as a regional important karstified aquifer with conduit flow, meaning a fast flow through the karst network. Due to the well-drained material identified in the research as the overburden above the bedrock on site, it is likely that any surface contamination to impact the upper layers of the Visean Limestones, thereby increasing the potential for reduced quality groundwater. Middle and deeper layers of the Visean Limestones could have more potable water then above.

It is understood that the typical yields of Visean Karstified Limestones can range from 225 - 400m^3/day.

The Waulsortian Limestones are mapped nearby as a locally important and moderately productive aquifer. However, the mapped rock type comprises of massive, unbedded lime-mudstone and groundwater flow will be controlled by the presence of fracture networks in the rock, and potential karstic features. Where the rock is dolomitised, productive fracture networks can be present at depth and where the rock is karstic, the productive areas can be shallow or at depth.

It is understood that typical yields from the Waulsortian Limestones can range from 12.5 – 125 m^3/hr, with a typical yield of c.42 m^3/hr.

Two nearby wells located within the Visean/Waulsortian/Lucan Limestones give yields of 49.1m^3/day and 152.6m^3/day at relatively shallow depths at 33.8m and 22.9m, respectfully.

Therefore, it is deemed **possible** that a well exploiting the underlying bedrock aquifers will meet the sites required flow rates of 50m^3/day.

It is deemed **likely** that groundwater quality at the site will be of potable standard however it is recommended that water samples are collected and tested to confirm potable water quality.

4 GROUNDWATER SUPPLY PRELIMINARY DESIGN

4.1 Legislative Considerations

The following legislative considerations and guidance will influence the feasibility and design process of any borehole installation and drinking water source:

- IGI (2007) Guidelines on Water Well Construction.
- EPA Drinking Water Advice Note No. 14, Borehole Constriction and Wellhead Protection (2013);
- European Union (Water Policy) (Abstractions Registration) Regulations 2018;
- European Communities (Water Policy) Regulations 2014 (S.I. No. 350 of 2014);
- European Communities Environmental Objectives (Groundwater) Regulations 2016 (S.I. No. 366/2016), as amended;
- European Union (Drinking Water) Regulations 2023 (S.I. No. 99/2023);
- Directive 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption;
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy; and
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.

4.2 Abstraction Licensing

Abstractions in excess of 25m^3/day are required to register with the Environmental Protection Agency (EPA) Ireland to inform of their abstraction. For new abstractions there is a requirement to register within 1 no. month of the operation of the abstraction.

No action is necessary for an abstraction of less than 25 m^3/day.

Proposed consumption at the site is up to 2.08m^3/hour, which if ran for 24 hours a day equates to c. 50m^3/day (50,000 litres), and as such an abstraction registration will be necessary, thus, action will be required.

4.3 Groundwater Supply Infrastructure

The following key design components will be considered in the preliminary design stage:

- Borewell construction details;
- Water treatment provisions; and
- Peak demand storage capacity.

4.3.1 Indicative Borewell Construction Details

There will always be uncertainty when drilling a borehole as it is an investigatory process, although based upon the potential of achieving the required yield and quality it is suggested that the borehole structure will be as follows:

Option 1 – Target the middle-deeper layers of Visean Limestones.

- Target Borehole Depth: c.40 - 80m
- Recommended Drill Method: Shell and Auger and/or Air Rotary or Air DTH
- Recommended Rig Type: Shell and Auger and/or Symmetrix or similar

The borewell design will typically consist of 244mm conductor casing through limestone diamicton till (c. 8-10m below ground level and well into the shallow bedrock to avoid contaminated water by an additional 5-10m, followed by the drilling of a bore at 200mm through limestone till c.10-12mbgl. It is recommended that the borehole progress a further 30m past the shallow bedrock which may also provide significant flows if a shallow fracture network exists that can also feed into the combined supply and to avoid any potential contamination from the surface through the well-drained material. The borehole will therefore exploit both

the shallow and moderate fractured bedrock. A gravel pack should be installed within the annulus around the screen intake with bentonite seal above and cement grout to the surface to ensure the top c.8-10m is appropriately sealed.

A trial well schematic for Visean Limestone is included in Appendix E.

An indicative outline design for a suitable borewell is provided overleaf. The final design may require the adjustment of the below design to meet site specific conditions and as such it is highly recommended that the works are overseen / supervised by a qualified hydrogeologist to ensure correct installation of the borewell.

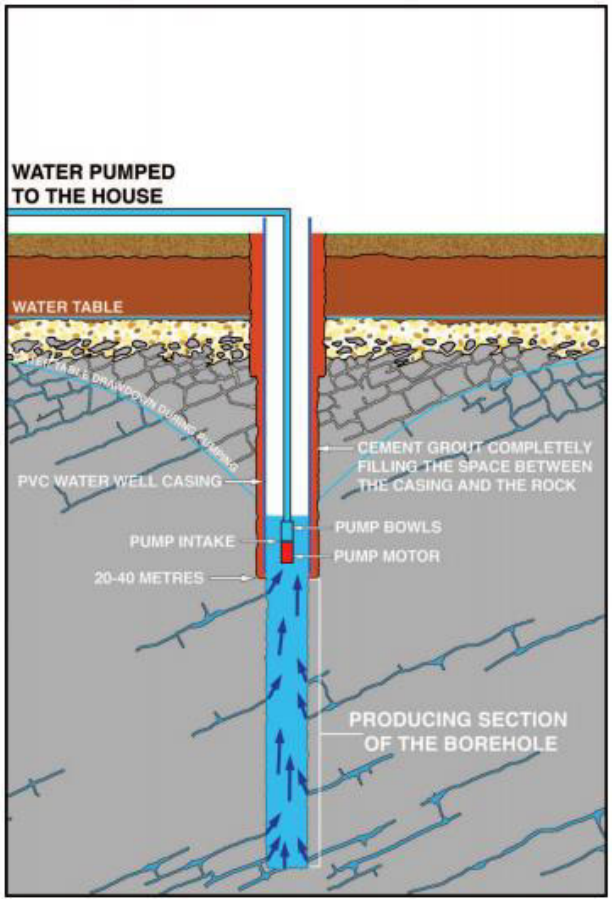


Image taken from Water Well Construction – The Institute of Geologist Ireland

Figure 4-1: Indicitive Well Construction (shallow – middle Visean Limestone aquifer)

Note that the above schematic diagram hows an indicitive well construction exploiting limestone till deposits overlying Visean Limestone bedrock. It is proposed that a well at the site can progress further into the Waulsortian bedrock aqufier.

Option 2 – Target the Waulsortian bedrock aquifer and deep fracture zones

- Target Borehole Depth: c.100-130m
- Recommended Drill Method: Air Rotary or Air DTH
- Recommended Rig Type: Rotary / Symmetrix or similar

Final well construction will be subject to change and findings onsite, subject to the advice of the Project Hydrogeologist. Should a significant source of water be encountered at depth, the till deposits and top weathered horizon of the bedrock will be sealed and, as such, the borewell will typically consist of 244mm conductor casing through unconsolidated material and weathered bedrock (c. 10-20m below ground level), followed by the drilling of a bore at 200mm through bedrock to depths of c.100-130mbgl.

A trial well schematic for Waulsortian Limestone is included in Appendix E.

An indicative outline design for a suitable borewell is provided overleaf. The final design may require the adjustment of the below design to meet site specific conditions and as such it is highly recommended that the works are overseen / supervised by a qualified hydrogeologist to ensure correct installation of the borewell.

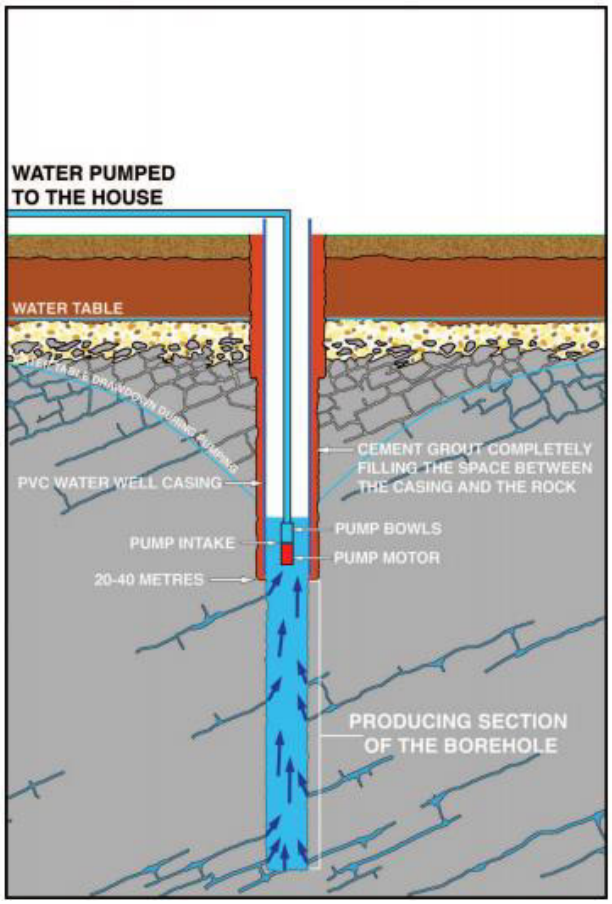


Image taken from Water Well Construction – The Institute of Geologist Ireland

Figure 4-2: Indicitive Waulsortian Limestone Well Construction

4.4 Completion and Testing of Borehole Installation

4.4.1 Borehole Headworks

Borehole headworks should be constructed in accordance with the Guideline on *Water Well Construction (Institute of Geologists Ireland 2007).* A typical headworks installation that complies with the aforementioned requirements is outlined below.

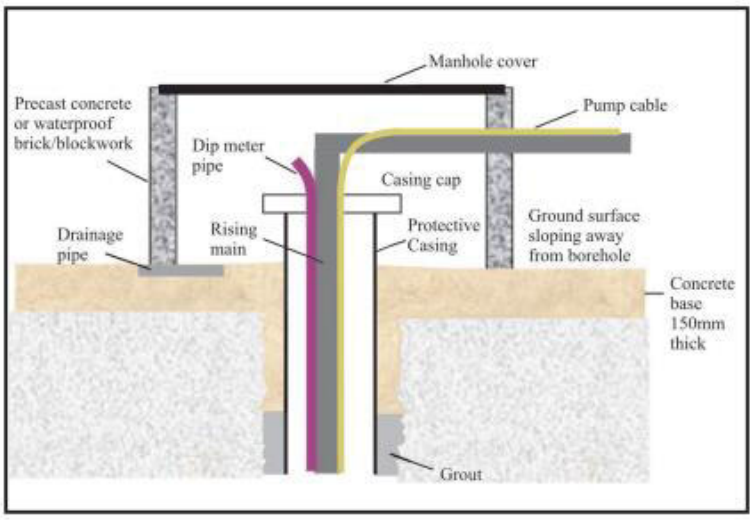


Figure 4-3: Well head completion

4.4.2 Supply infrastructure and pipework

The initial design will allow for a submersible pump suitable for operation at the required low flow rates to be installed with a 120 ltr pressure vessel that will act as initial storage at surface and circulate water around the system at a suitable pressure. Another option would be to install a pump more suited to pumping at a higher flow rate and install a large 'header tank' / 'storage tank' at the surface and pump water round the system from the storage tank at the required flow rate and pressure when required.

The nature of the supply installation would be defined at a subsequent stage and on accurate determination of Client requirements for the nature of the supply and use.

4.4.3 Borewell Testing

A constant rate pumping test should be completed for a period of c.48 hours to confirm that the new well yield is sustainable and a 24-hour recovery period for well/aquifer stabilization. Water quality samples should be collected following prolonged pumping and analysed at an accredited laboratory.

5 SUMMARY AND RECOMMENDATIONS

5.1 Project Background

This Groundwater Abstraction Feasibility Assessment report was commissioned by John Sisk & Son Ltd to assess the feasibility of installing a groundwater supply at Pollboy residential development site in Ballinasloe. The water supply will be used as a water source for a proposed residential development.

This feasibility study has evaluated the technical feasibility of installing a private groundwater well by assessing the geological and hydrogeological setting of the site and determining the likelihood that a groundwater well will meet the sites water demand in full.

5.2 Outcome

Based on information gathered during this study, it is deemed **possible** to **likely** that a borewell at the site will achieve the required yield, and as such, is deemed technically feasible.

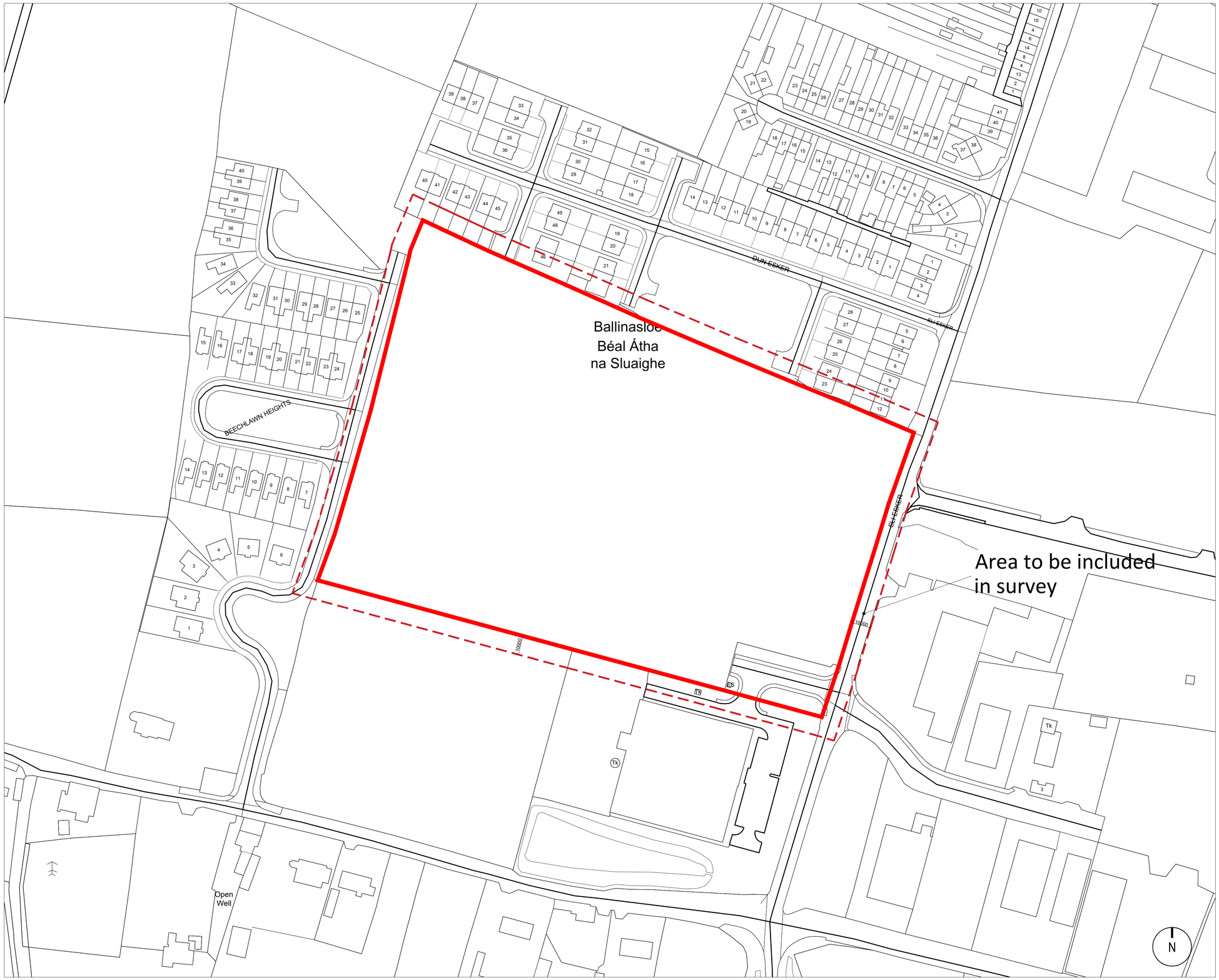
5.3 Recommendations

Installing a private groundwater supply at the site has been deemed technically feasible, and as such, it is recommended that the construction and installation of a trial borewell as detailed in Section 4 is further considered.

The trial well should determine the thickness and composition of till materials (overburden) at the site, as well as the composition and potential productivity of the underlying bedrock to depths of c.40mbgl to 130mbgl. Crude airlift test should be carried out at regular intervals during drilling to develop a picture of how yield changes with depth, and depths of significant water bearing geological features. Following drilling and installation. Long term pumping tests should be carried out by a qualified Hydrogeologist to confirm water quantity and water quality.

Appendix A

Site Location Map



SITE INFORMATION

Site Location in RED

Note:
Site survey should also include area beyond site boundary
(Approx. 10m beyond the boundary line to dashed line)

Site Coordinates:

Irish Grid: M 85382 29981

GPS: 53.320118, - 8.2201197

Site Information:

Total Site Area: 4.7 Ha

LEGEND

OPW Oifig na nOibreacha Poiblí Office of Public Works

Office of Public Works
a: Jonathan Swift Street,
Trim, Co. Meath,
C15 NX36
t: 046 942 2000
w: www.gov.ie/opw

OPW Architectectural Services

Drawing Revision:

Revision	Date	By	Chk'd	Description

Drawing Revision:

Revision	Date	By	Chk'd	Description

Project Title:
Ukrainian Emergency Accommodation
Pollboy, Co. Galway

Drawing Title:
Existing Site Location Map

Project Role:	OPW Section Project Reference:	Scales at A1:
URMH	A.22.003	1:1000

Drawn:	Checked:	Approved:	Date:
RH	EO	AD	08.03.2023

Status Description:	Status:	Revision:
Information	Information	Rev

Drawing Number:
20-SK-001

Do Not Scale

Rev 1.1

Appendix B

Proposed Development Plans

SITE INFORMATION

Site Location in RED

Site Coordinates:
GPS: 53.319687, -8.221499

Site Information:
Site Area: c 4.6 Ha

Proposed Units: 92
20 Units / Ha

LEGEND

01 02	MODULAR UNITS
	OPEN GREEN SPACE
	PLANTED BUFFER ZONE

DRAFT

WORK IN PROGRESS

OPW Oifig na nOibreacha Poiblí Office of Public Works

Office of Public Works
a: Jonathan Swift Street, Trim, Co. Meath, C15 NX36
t: 046 942 2000
w: www.gov.ie/opw

OPW Architectectural Services

Drawing Revision:

Revision	Date	By	Chk'd	Description

Drawing Revision:

Revision	Date	By	Chk'd	Description

Project Title:
Ukrainian Emergency Accommodation
Pollboy, Ballinasloe, Co. Galway

Drawing Title:
Site Layout Plan
XX Units / XX Parking Spaces

Project Role:	OPW Section Project Reference:	Scales at A1:
URMH	A.22.003	1:1000

Drawn:	Checked:	Approved:	Date:
RH	EO	AD	10.03.2023

Status Description:	Status:	Revision:
DRAFT	WIP	Rev

Drawing Number:
20-SK-001

Do Not Scale

Ø Office of Public Works

Rev: 1.1

Appendix C

Borehole Logs

CSA Ltd

Summary Drill Log

Client Rio Algom - Ivernia West

Drillhole No. 97-3459-07

Licence No. 3459 Block Ballinasloe

County Galway Townland Garbally

Nat. Grid Ref. ________ E ________ N

Location Map OS 17/23 S.W. Scale 1:25000

Purpose of drillhole To Test Base of Waulsortian in an area known to be geochemically active

Date started 3/4/97 Date finished 30/4/97

Elevation ________ Angle -90°

Azimuth - Depth 682 m

Dip tests —

Hole left open Yes ________ No —

Material left in hole —

Contractor IDL

Driller/helper [redacted]

Hydrological data -

Landowner [redacted]

Compensation [redacted]

Logged by [redacted] Date 2/5/97

Micropal None

Conclusions Some haematisation + dolomite seen

Summary log scale 1:5000

Mineralization (assays)					Depth	Lith.	Stratigraphy, Interpretation Micropalaeo dates, Major structures
Zn	Pb	Cu	Fe	Dol			
							6m — Ouerburden; Top Quarries Facies Shelf limestone — 89m
				137.5 - 145 Black Dol	100		
					200		Waulsortian
					300		
					400		
					500		
					600		Mod. Haem 612.4 - 635.4; — 657m; ABL; — 682m
					700		EOH 682m

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3459-07	PROPERTY	PROSPECT
Angle: Azimuth: Length:	Date started: Date completed: Contractor:	Geophysical Logs: Dip Test: P.L. No.:
		Townland: Elevation: Scale: 1:100

Depth	TAG	% rec.	RQD	BIO.	STR	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
0													
2													
4									Overburden				
6	6								6m				
8												Box 1	
10	10								Top Quarries(?) facies				
12									Very encrinitic calcarenite with shale partings.				
13	13											Box 2	
14													
16	16												
18												Box 3	
20													
22	22											Box 4	
24													
25	25												

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DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-369-07 | PROPERTY | PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
P.L. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	% rec.	ROD	BIO.	STR	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
25	25											BOX 5	
27	27												
29													
31	31								Top weathered rock is clay			BOX 6	
33													
35	36											BOX 7	
37	37												
39	40											BOX 8	
41													
43	42											BOX 9	
45	46												
47													
49	49											BOX 10	
51													

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DETAILED DRILLHOLE LOG

SHEET 3 OF [illegible]

Logged by [redacted]

NAME 97-3159-02 PROPERTY PROSPECT

Angle: Azimuth: Length:

Date started: Date completed: Contractor:

Geophysical Logs: Dip Test: P.L. No.:

Townland: Elevation: Scale: 1:100

Depth	TAG	% REC.	RQD	BIO.	STR.	DETAIL	ALT.	STR.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/Bag No.	ASSAY/GEOCHEM.
50													
52	58											B 0 X 11	
54													
	59												
56									Top Quartz Veins.			B 0 X 12	
	58												
58													
60													
	61											B 0 X 13	
62													
	64												
64													
												B 0 X 14	
66													
	69												
68													
	70											B 0 X 15	
70													
	72												
72												B 0 X 16	
74													
76													

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3459-07	PROPERTY	PROSPECT

Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	PL. No.:	Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
75									75.5 Base of T.O. Facies			BOX 16	
	76												
77									Dominantly calcarenite with ~10-20% argillite but much less arenite.				
79	79								Argillite in wisps and sometimes gives a nodular appearance to the calcarenite			BOX 17	
81													
	82												
83												BOX 18	
85	85												
87													
	88											BOX 19	
89									89 Top of Waulsortian.				
91	91								Micrite dominant contains some wispy argillite				
93									92.8				
	94											BOX 20	
95									Waulsortian.				
97	97								Micrite dominant with ~15% sparry calcite				
									Occasional crinoid				
99												BOX 21	
100	100												

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DETAILED DRILLHOLE LOG

SHEET 5 OF

Logged by: [redacted]

NAME 97-3457-07	PROPERTY	PROSPECT
Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	PL. No.:	Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/ Sam.	ASSAY/GEOCHEM.
100	100											Box 21	
103	103												
106	106								Wackestone, continuing as above.			Box 22	
109	109					Sub vertical calcite vein 109.4–							
112	112											Box 23	
115	115								–113.8 Red[?] ... [illegible]				
118	118								W/p. Mac., dom. ... 15% ... Occ. crinoids.			Box 24	
121	121												
124	124											Box 25	

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DETAILED DRILLHOLE LOG

SHEET 6 OF

Logged by [redacted]

NAME 97-3459-07 PROPERTY PROSPECT

Angle: Date started: Geophysical Logs: Townland:
Azimuth: Date completed: Dip Test: Elevation:
Length: Contractor: PL. No.: Scale: 1:100

Depth	TAG	% rec	RQD	Brk	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
125												25	
127	127					Vein of white dol → 126.8; 60° TCA; 127.8			Grey, fine grained replacive dol. occ. vugs with crystalline dol.				
129												Box	
	130								Waulsortian				
131									Continuing micrite dom. but with very little stromatactis < 5%. Occ. crinoids			26	
133	132												
135												Box	
	136												
137												27	
139	139					137.5 Grey, fine grained [illegible] dolomite 140.8			← slightly argillaceous [illegible]				
141						141.1 Grey, f.g., replacive dol. Original texture preserved.						Box	
	142								Original Waulsortian coloured vugs & cavities, but micrite dominant.		142.2 Trace Py.	28	
143						143.6			Initial [illegible] Waul. micrite dom.				
145	145					Dolomite as above. 145.5							
147									Waulsortian Lst. Micrite dom., w. ~10% stromatactis			Box	
149												29	

CROWE SCHAPPALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3459-07	PROPERTY	PROSPECT
Angle:	Date started:	Geophysical Logs:
Azimuth:	Date completed:	Dip Test:
Length:	Contractor:	PL. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	DETAIL	ROCK TYPE & ALTERATION	MINERALISATION	Box/sam.
150					
	151				
152					
			Waulsortian Lst ~50% Micrite. Quite bioclastic		BOX
154	154		Frequent stromatactis		30
			Occasional ~5cm horizons of calcarenite.		
156					
	157				
158					BOX
160	160		160.1 Calcarenite. 161		31
		Stylolite(s) assoc. fine Cr-lens(?) 162	Micrite dom		
162		Sub vertical veins of black dolomite 162.8	162 Calcarenite dom(?), with some stromatactis.	Specks of Py in dolomite, ... vein of 162.8, 163.2m	
	163	Strip ... undolomitized lst. Occ. specks of Py. Vein of W.D. @ 162.2. Also some black dol in cavity fill.			
164			164.2		BOX
166	166	~165.2 The ... fragments(?), ... calcite ... with ... sediment(?) 166.4 ...	Waulsortian Lst. Micrite dom. with ... stromatactis.		32
168					
	169				
170					BOX
172	172				33
174					
175	175				34

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DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3451-07 PROPERTY PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	DETAIL	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
175	176						
177		Sul mixed abd. 176.8 / ven. w. fine 177.6 / Phyll u ms. / Mud sup / undeformed clasts of ...	Micrite Intraclast. <10% Strom			33 / 34	
	178						
179			179.9				
181	181		Approx. equal amounts of micrite + calcarenite, w. some stromatolites			35	
183	184						
185							
187	187						
189	190					36	
191			191.9				
193	193		Approx. equal amounts micrite + stromatolites				
195	196		Occasional crinoid			37	
197							
199	199					38	

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DETAILED DRILLHOLE LOG

SHEET 9 OF 23

Logged by [redacted]

NAME 97-3459-07 PROPERTY PROSPECT

Angle: Date started: Geophysical Logs: Townland:
Azimuth: Date completed: Dip Test: Elevation:
Length: Contractor: PL. No.: Scale: 1:50

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam	ASSAY/GEOCHEM
200													
202	202											BOX 38	
204	205												
206									Continuing micrite - stromatactid Wa.			BOX 39	
208	208								Minor V.G. Occ. crinoid				
210	211												
212												BOX 40	
214	214												
216	217												
218												BOX 41	
220	220												
222	223								223.5			BOX 42	
224									Micrite debrit				

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 10 OF 20

Logged by: [redacted]

NAME 97-3459-07	PROPERTY	PROSPECT

Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	P.L. No.:	Scale: 1:100

Depth	TAG	% rec	RQD	SHO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/ sam.	ASSAY/GEOCHEM
225	226											42	
227													
229	229								Waulsortian Limestone Cataray Mottle dominant with 20-25%			BOX 43	
231									Stromatactis. Quite stylolitic.				
	232								Occasional crinoids				
233													
235	235											BOX 44	
237	238												
239									239.5				
241	241								Waulsortian Stromatactis with Some veins here			BOX 45	
243	244												
245													
247	247											BOX 46	
249													
250	250											47	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3659-07	PROPERTY	PROSPECT
Angle:	Date started:	Geophysical Logs:
Azimuth:	Date completed:	Dip Test:
Length:	Contractor:	PL. No.:
Townland:	Elevation:	Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
250	250								250.1 – 250.5 [Laterite? Stromatolites,] Crystalline a centre				
252	253											Box 47	
254									Stromatolite + V.B Wackestone				
256	256								W. some Grainstone [illegible] <30%.				
258	259											Box 48	
260													
262	262												
264	265											Box 49	
266													
268	268								268.5 – – – – –				
270	271								Mainly dominant. Stromatolites <20%.			Box 50	
272									Some stromatolites shows [illegible] [illegible] with alternating beds of [illegible] + dark [illegible] [illegible]				
274												Box 51	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 12 OF 18

Logged by [redacted]

NAME 97-3459-07 PROPERTY PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
P.L. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	% rec.	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
276													
277	277								Wn as above			BOX 51	
279	280								280.6				
281									Stromatactid Wn			BOX	
283	283					283.4 Sub vertical vein of white dol. Sharp contact w. Wn 283.57			283.9			52	
285	286												
287									Wn. Micrite dominant Stromatactid exent varies from 15-50%. Occ. crinoids.			BOX 53	
289	289												
291	292								293.1–293.5 Highly stylolitised.			BOX 54	
295	295												
297	297											BOX 55	
300													

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3459-07 PROPERTY PROSPECT

Angle: | Date started: | Geophysical Logs: | Townland:

Azimuth: | Date completed: | Dip Test: | Elevation:

Length: | Contractor: | PL. No.: | Scale: 1:100

Depth	TAG	% rec	RQD	BIO.	STR	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/ com.	ASSAY/GEOCHEM.
300													
	301											55	
302													
304	304											Box	
												56	
306													
	307												
308													
310	310											Box	
												57	
312													
	313												
314									Vesiculation lot. Mainly mafic diorite with 30-45% well developed amygdales. Occasional [illegible]. Occasional [illegible].				
316	316											Box	
												58	
318									Grading [illegible] [illegible] [illegible] of occasional calcareous horizons ≤ 5cm thick.				
	319					10cm of slightly 319 - bleached [illegible] argillite							
320													
322	322											Box	
												59	
324													
325	325												

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3459-07	PROPERTY	PROSPECT
Angle: / Azimuth: / Length:	Date started: / Date completed: / Contractor:	Geophysical Logs: / Dip Test: / PL. No.: / Townland: / Elevation: / Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT.	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/ sam.	ASSAY/GEOCHEM.
325	325												
327													
	328					Black + white dol in 5.d veined 328.4 vein fill. White [illegible] [illegible]						Box	
329												60	
331	331												
									Waulsortian limestone. Micrite dominant. Contains 30-40% Stromatactis. V. minor [illegible] veins [illegible] Slightly stylolitic.				
333												Box	
	334					[illegible] 334 Ankerite/calcite with white [illegible] [illegible] 90° [illegible]							
335												61	
337	337												
339												Box	
	340												
341						White dol. in 341 cavity fill (Coral [illegible])						62	
343	343												
345									345 8cm thick vein CaCO3 55° TCA				
	346					As above 345						Box	
347												63	
349	349											Box	
									349.7 F.Z. [illegible] calcite filled			64	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3659-07	PROPERTY	PROSPECT

Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	PL. No.:	Scale: 1:100

Depth	TAG	% rec	RQD	BIO.	STR	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
351									350.5 Fine-grained calcarenite				
352	352					Brecciated flat (4cm) zone of white crystalline dolomite @ ~70° TCA. These are indicated by "white dol."					351.8 Py rimming non-rotational white dolomite vein, also @ 352.2	Box 64	
354	355								Waulsortian continues. Micrite dominant, with ~10-20% stromatactis.				
356						White dol. 356.6					356.5 Py in stylolite		
						White dol. with dark calcite rim. 357							
358	358											Box 65	
360	361								360.4 F.G. Calcarenite 360.8				
362													
364	364								Waulsortian continues. Micrite dominant w. ~15% stromatactis. Also some breccia areas.			Box 66	
366											366.1 Vein of white dol w. Py rimming.		
	367								Pyrite in stylolitically smoothed/rotated vein white dol. 367.2		367.6 Py in stylolite		
368						Stylolite in vein fill with Py rimming ~55° TCA. 369.1					Py rimming vein stylolite	Box 67	
370	370												
372													
	373												
374												Box 68	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3059-07	PROPERTY	PROSPECT	
Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	PL. No.:	Scale: 1/100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM
375	376								Wackestone continuing. Mostly dolomit. Contains 30% to 40% stromatolite			Box 68	
377											377.5 Trace Py [illegible]		
378	379	85				Sub vertical stylolitic 378.7 [illegible] veins of black dolomite.						Box 69	
381	382								382 Calcarenite / Pebbly 382.6				
383						383.5 Dk & white dolo [illegible] 384.5							
384	385					Black dolomite filling [illegible] stromatolites, white dolomite on [illegible] 386.4			Wackestone. [illegible] in near equal proportions [illegible] — stromatolite. Some v.g. disp.			Box 70	
387	388												
389						Vertical vein of 389.5 stylolitically [illegible] black dolomite							
390	391											Box 71	
393	394								394.3				
395													
397	397								Shell shams & stromatolites [illegible] Quite [illegible]			Box 72	
399	400											73	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 17 OF 28

Logged by [redacted]

NAME 97-3059-07 PROPERTY PROSPECT

Angle: Date started: Geophysical Logs: Townland:
Azimuth: Date completed: Dip Test: Elevation:
Length: Contractor: PL. No.: Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
400	400												
402													
	403								Waulsortian as above			Box 73	
404													
406	406												
408						Sst vertical dolomite vein black 408.9 dolomite oxide white dolomite vein			407.7 — ~45-50% Micrite 15-20% Stromatactis 30-35% Calcarenite			Box 74	
	409												
410													
412	412												
414												Box 75	
	415												
416						Dolomite vein 417- 75 45°							
418	418												
420												Box 76	
	421												
422													
						Green Argillite			423 Qtz Breccia w. some argillite 423.7 —				
424	424											Box 77	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME	97-3459-7	PROPERTY		PROSPECT	
Angle:		Date started:		Geophysical Logs:	Townland:
Azimuth:		Date completed:		Dip Test:	Elevation:
Length:		Contractor:		PL. No.:	Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM
425													
427	427								Micrite generally dominant with ~15% Sparite. Also some calcarenite. Coarse crinoids.			Box 77	
429	430												
431												Box	
433	433											Box 78	
435	436												
437													
439	439											Box 79	
441	442								440.5 — increase in crinoidal content				
443													
445	445											Box 80	
447						446.5 → 447.4 Slightly bedded micrite							
449	448											Box 81	
450													

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3459-07	PROPERTY	PROSPECT
Angle:	Date started:	Geophysical Logs:
Azimuth:	Date completed:	Dip Test:
Length:	Contractor:	PL. No.:
Townland:	Elevation:	Scale: 1/100

Depth	TAG	DETAIL	ROCK TYPE & ALTERATION	MINERALISATION	Box
450		Green Argillite 450.0 + V. minor pink banding		450.3 speck Fe	
	451	451.2 End of Bleaching			
452				452 speck Fe [illegible] vein	BOX 81
		Micrite Bleaching			
454	454		Waulsortian.		
		Occasional white dolomite seen in cavity fill / Marcasite w.s.	~50% micrite with abundant stromatactis / cavity fill as well as v. coarse crinoids, slightly micritic in places.		
456					BOX
	457				82
458		End of bleaching 458.5 w. 459		459.9 [illegible] Fe	
460	460				
462					BOX
	463				83
464					
466	466				
468					BOX
	469				84
470					
472	472	w.s. 464			
474					BOX
	475				85

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME	97-3459-07	PROPERTY		PROSPECT	
Angle:		Date started:		Geophysical Logs:	Townland:
Azimuth:		Date completed:		Dip Test:	Elevation:
Length:		Contractor:		PL. No.:	Scale: 1:100

Depth	TAG	% rec.	RQD	BIO.	STR.	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
475	475											85	
476									476.1				
477									Waulsortian Stromatactid?				
478	478								Abundant crinoids			BOX	
479													
480						Slightly bedded micrite 480.?						86	
481	481					V. Pale Haem 481.5 481.6			481 / 481.6 Top 75° TCA Vein of white + pink [illegible] dolomite 481.? Bottom 60° TCA				
483													
484	484								Waulsortian Micrite dominated w. ~30% Stromatactis.			BOX	
485													
486												87	
487	487												
489													
490	490												
491						End of bleaching 491.?						BOX	
492												88	
493	493												
495													
496	496					WD with [illegible] 495.6' Calcite						BOX	
497												89	
499	499												
500												90	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3457-07 | PROPERTY | PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/com.	ASSAY/GEOCHEM.
500													
502	502												
									503 – 503.5 Veins below dominant		503.8 Py in stylolites	BOX 90	
504						504.5							
	505					White dolomite Cavity fill common. Mostly as veins 30–75° TCA. Poss. fault related? 507.5 ~15% of core							
508	508								Waulsortian Micrite dominant. 20–30% Stromatactis			BOX 91	
510						Veins w.r.a. common, calcite/dolomite common.							
	511												
514	514										514.6 Py common	BOX 92	
	517												
518						W.D. 70° TCA 518.5 – 519			518.5				
	520	75%				519.5 Cc brecciated poss. fault zone?			519.5 Cc brecciated. Stromatactis – 1.6			BOX 93	
522											521.8 Trace Py		
	523											BOX 94	
524													

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 22 OF 28

Logged by [redacted]

NAME 97-3459-04 PROPERTY PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	% rec	RQD	BIG	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM
525	526	90%				Rubl + wads 525.6 Clay ... 526					525.5 Trace ...	BOX 94	
527									Stromatactid + VB Wh., w... some micrite + occ. calcarenite				
529	529												
531												BOX 95	
	532												
533													
535	535					Sub vertical vein 535.2 v.i.c. with calcite ctm. 536.2							
537												BOX 96	
	538												
539									540.5				
541	541								Micrite ... Stromatactid – v.b. abundant.				
543												BOX 97	
	544												
545													
547	547												
549												BOX 98	
550	550												

CROWE SCHAPPALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3459-07 PROPERTY PROSPECT

Angle: Azimuth: Length:

Date started: Date completed: Contractor:

Geophysical Logs: Dip Test: PL. No.:

Townland: Elevation: Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
550	550								Wn as above			98	
552													
	553												
554												BOX	
												99	
556	556												
558													
	559												
560						560						BOX	
						Mutla brecciated							
562	562								Approximately 50% matrix, remainder is composed of stromatolite and veins above.			100	
						563.1							
564									Sub vertical – vertical calcite veins 1cm or				
	565												
566									Slightly stylolitic			BOX	
									Occ. areas				
												101	
568	568												
570													
	571												
572												BOX	
												102	
574	574												
												103	

Crowe Schaffalitzky & Associates Ltd.

DETAILED DRILLHOLE LOG

Logged by: [redacted]

NAME 97-3459-7 PROPERTY PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:200

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
577	577											BOX 103	
579													
580	580					White dolomite vein 580.1 crosscut by later calcite vein			-579.6 Dol calcite assoc. w. Strom				
581													
583	583					~vertical vein of black dolomite & white dolomite + calcite vein Calcite in to dol 583.4			-583.4 Black dol in vein ~50° TCA. -583.7 ~Sub vertical black dol vein with a white dol core. The black dolomite is medium grained, and dark grey - black, rather than being completely black			BOX 104	
585													
586	586								586.2 586 — — — Calcarenite — —				
587													
589	589								50-60% micrite. Bioclasts is stromatactis + sub vertical fracture fill (Calcite) with some veins blue. Occasional bioclasts - crinoids + brachs.			BOX 105	
591													
592	592								Some thin subvertical to vertical, bitty crosscutting calcite veinlets.				
593													
595	595											BOX 106	
597													
598	598					Subvertical Calcite vein with associated dol-calcite grains (Bright) Partly dolomitised.						BOX 107	
599													
600													

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 25 OF 28

Logged by [redacted]

NAME 97-3459-07 PROPERTY PROSPECT

Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	PL. No.:	Scale: 1:100

Depth	TAG	DETAIL	ROCK TYPE & ALTERATION	MINERALISATION	Box/sam.
600		600 600.4 600.6	Sub vertical vein of black m.g. dol. + grey		
	601		calcite. Also assoc. with white dolomite		BOX
602					107
			603.5 Top 40° rei Grey dolomite partially replaced		
604	604		604.2 Contains some bottom 50° rei white/pink dolomite veining		
606					
	607				BOX
608			50-60% recrystallised with stem + v.b.		108
610	610				
612					
	613				BOX
614					109
616	616				
618					
	619			619.3 Specks Py	BOX
620					110
622	622	622.4 Faint to moderate haematization in micrite.			BOX
624					111
	625				

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3459-7 | PROPERTY | PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	% rec	RQD	BIO	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
625	625					Haematized 625.0					625.2 Sph [illegible]	BOX 111	
627											626.9		
	628												
629											628.5		
631	631								Continuing micrite dominant (~60-70%) with stromatolitic and some V.B. [illegible] crinoids.		631.5	BOX 112	
633						V. late Haematization 633							
	634					634.1			636.3				
635									Slight increase in argillite content, as well as crinoids. Also wispy argillite.				
637	637								Increase in styl. to ~3%			BOX 113	
639													
	640												
641													
643	643					Slight haematization 643						BOX 114	
645													
	646												
647													
649	649											BOX 115	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 27 OF 28

Logged by:

NAME 17-3459-7 PROPERTY PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:100

Depth	TAG	% rec	RQD	BKD	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
650													
									Waulsortian			115	
652	652								B				
									652.1				
									base of Waulsortian				
654									crinoidal facies			BOX	
									v. crinoidal micrite				
	655								w. ~15% ...				
												116	
656													
									657 BASE OF WAULSORTIAN				
658	658								ARGILLACEOUS				
									BIOCLASTIC				
									LIMESTONE				
									(No NMU)				
660												BOX	
									~ 90% Argillite, w.				
	661								some calcarenite			117	
662													
664	664												
666												BOX	
	667											118	
668													
670	670												
672												BOX	
	673											119	
674													
												120	

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

Logged by [redacted]

NAME 97-3159-T | PROPERTY | PROSPECT

Angle:
Azimuth:
Length:

Date started:
Date completed:
Contractor:

Geophysical Logs:
Dip Test:
PL. No.:

Townland:
Elevation:
Scale: 1:100

DEPTH	TAG	SAMPLE TYPE	FROM	SAMPLE NO.	STR	DETAIL	ALT	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/Bag	ASSAY/GEOCHEM.
675													
	676												
677												BOX	
									ABL				
679	679											120	
681												BOX	
	682											121	
									End of Hole 682 m				
683													
685													
687													
689													
691													
693													
695													
697													
699													
700													

CSA Ltd — **Summary Drill Log** — **Client** R.A - I.W.

Drillhole No. 97-3459-11

Licence No. 3459 Block B

County Galway Townland [illegible]

Nat. Grid Ref. 123375 E 230900 N

Location Map OS [illegible] Scale 1:25000

Purpose of drillhole [illegible]

Date started [illegible] Date finished [illegible]

Elevation ______ Angle 90

Azimuth – Depth [illegible]

Dip tests –

Hole left open Yes ______ No –

Material left in hole ______

Contractor ______

Driller/helper [redacted]

Hydrological data ______

Landowner [redacted]

Compensation [redacted]

Logged by [redacted] Date [illegible]

Micropal ______

Conclusions [illegible]

Summary log scale 1:200

Mineralization (assays) Zn	Pb	Cu	Fe	Dol	Depth	Lith.	Stratigraphy, Interpretation Micropalaeo dates, Major structures
							Shale

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 1 OF 1

Logged by: [redacted]

NAME 97-3457-11	PROPERTY	PROSPECT

Angle:	Date started:	Geophysical Logs:	Townland:
Azimuth:	Date completed:	Dip Test:	Elevation:
Length:	Contractor:	PL. No.:	Scale: 1:100

Depth	TAG	% rec.	RQD	BIO.	STR	DETAIL	ALT.	LITH.	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
0									Overburden.				
2									2m				
									Open Hole To 3m				
4	4											Box 1	
6													
	7								Crinoidal Shelf n grainstone. Medium to coarse grained, with some stylolites. Light to mid grey in colour. V. Uniform				
8													
10	10											Box 2	
12													
	13											3	
14													
16	16												
18												4	
	19												
20													
									EOH 20.5m				

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET 1 OF

Logged by: M.A.K

NAME 95-3459-02 | PROPERTY Ballinasloe PLS | PROSPECT

Angle: Vertical
Azimuth:
Length: 31 m

Date started: 21-April-1995
Date completed: 21-April-1995
Contractor: IRISH DRILLING

Geophysical Logs: -
Dip Test: -
P.L. No.: 3459

Townland: POLLBOY
Elevation: -
Scale: 1:100

Depth	% rec	Struct	DETAIL	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/sam.	ASSAY/GEOCHEM.
0									
10									
11									
12									
13									
14									
15					0 - 24.50 Sandy Overburden Evidence for v. clean Sand Hole drilled on ESE trending ESKER.				
16									
17									
18									
19									
20									
21									
22									
23									
24									
25			24.90 Arundian Date		S. Reef (CALP). Mud. Shaley. Nun shelf-limestones. Mud fossiliferous				
26									
27					▼ Coarsening-upwards Cycles				
28									
29									
30									
31					EOH @ 31metres				
32									
33									
34									

CROWE SCHAFFALITZKY & ASSOCIATES LTD.

DETAILED DRILLHOLE LOG

SHEET OF

Logged by: [redacted]

NAME 45-3459-01 PROPERTY Baffinslee PLS PROSPECT

Angle: Vertical Date started: 20-April-1995 Geophysical Logs: Townland: POLLBOY
Azimuth: Date completed: 20-April-1995 Dip Test: Elevation:
Length: 22m Contractor: IRISH DRILLING P.L. No.: 3459 Scale: 1:10

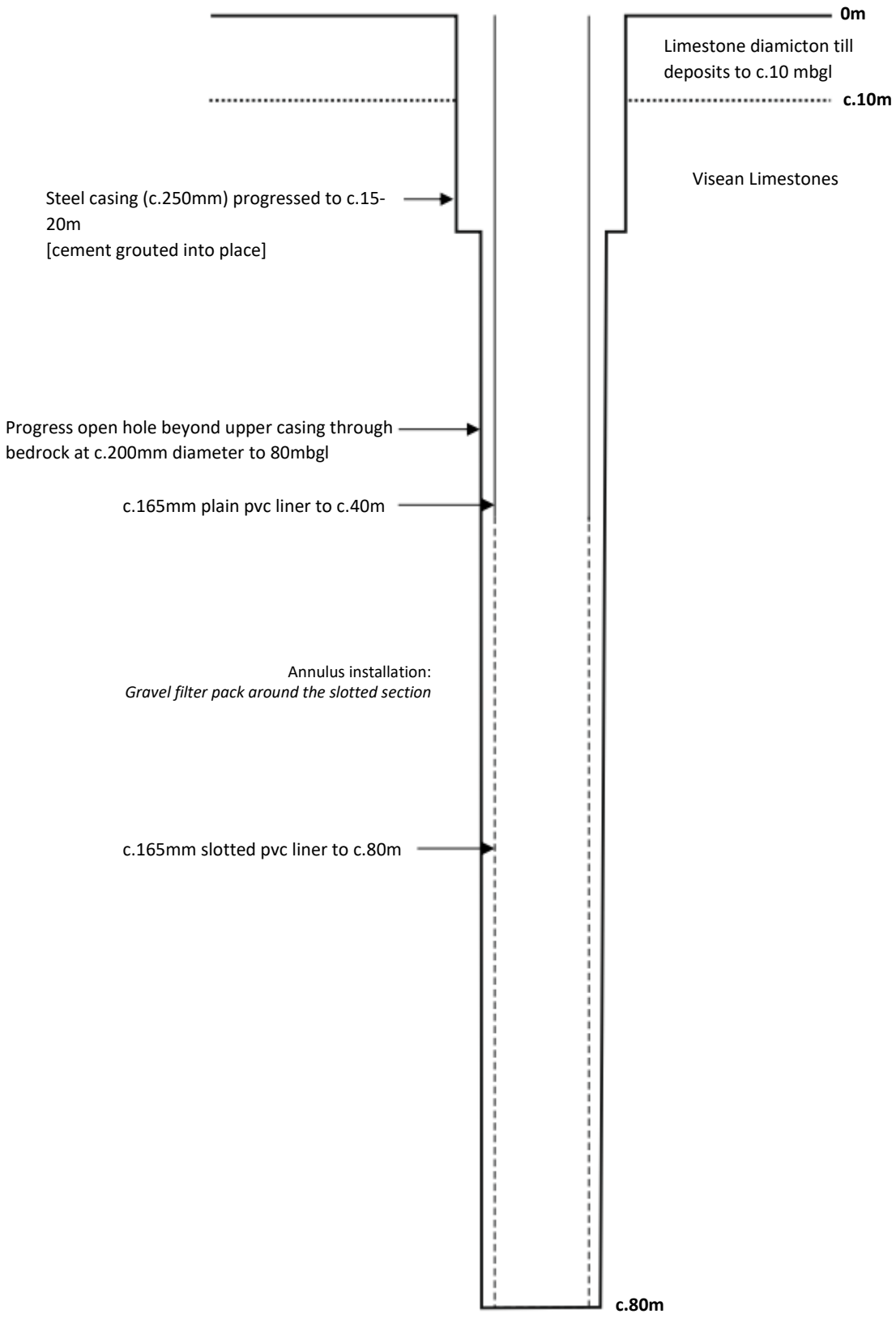
Depth	% rec.	Struct	DETAIL	LITH	ROCK TYPE & ALTERATION	MIN.	MINERALISATION	Box/ sam.	ASSAY/GEOCHEM.
1									
2									
3									
4									
5					OVB: Peat + Sand				
6									
7									
8									
9									
10									
11									
12					11.5m SHALE MATERIAL, COND BAL Grainstone V. Fossil. Foram medium - Coarse grained				
13					13.3m More typical Dense BK Calc Less fossil. Forams				
14									
15									
16									
17									
18									
19									
20					19.90m → EARLY ARUNDIAN age.				
21									
22					EOH @ 22m				
23									
24									
25									

Appendix D

Correspondence

Appendix E

Trial Well Schematics



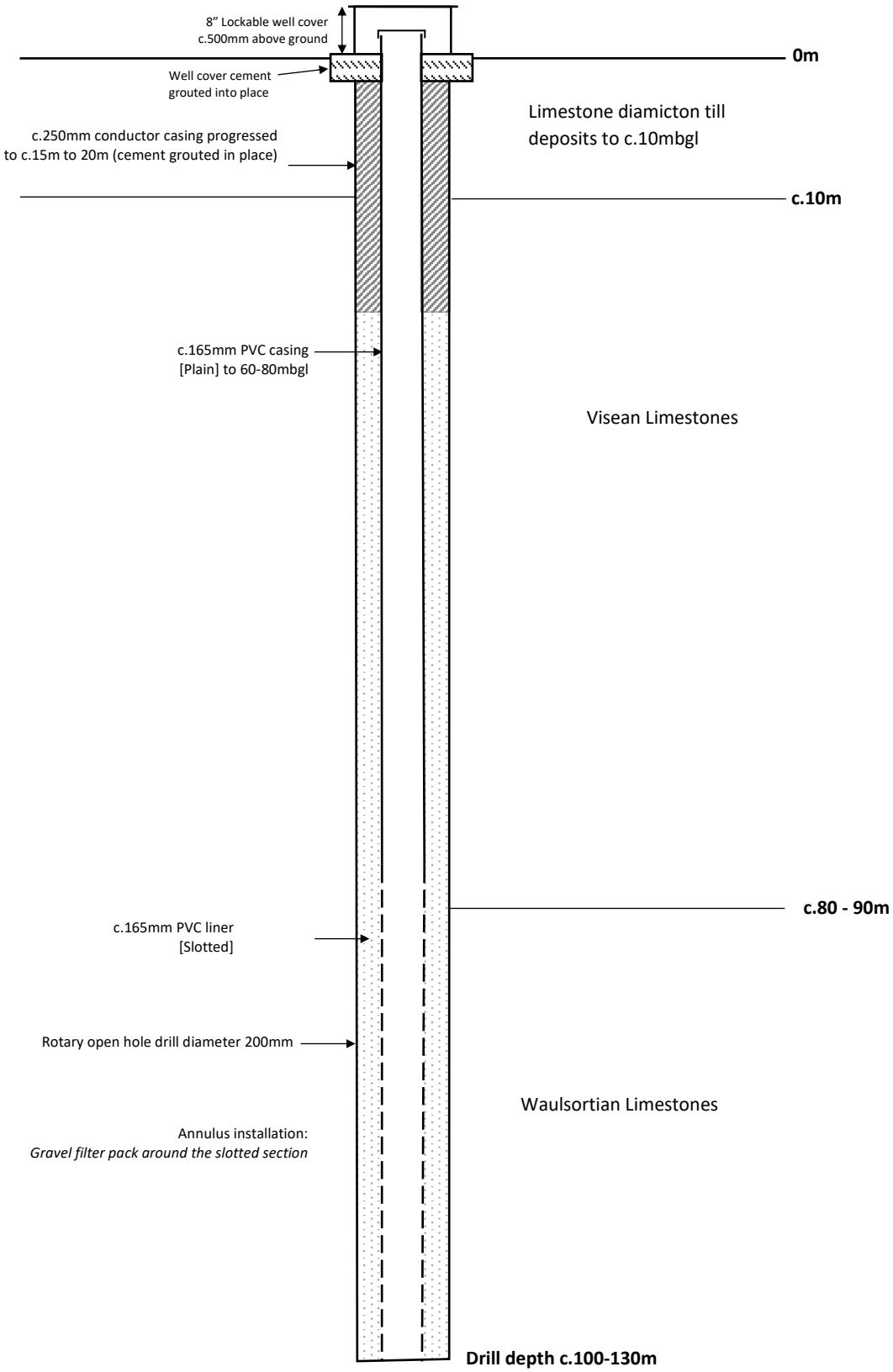
McCloy Consulting

E: info@mccloyconsulting.com W: www.mccloyconsulting.com

Description: Visean Limestone Trial Well Preliminary Design Schematic

Project: M02220-01 Pollboy, Ballinasloe

Drawn By: RT | **Revision:** 00 | **Date:** 22/08/2023



McCloy Consulting
E: info@mccloyconsulting.com
W: www.mccloyconsulting.com

Description: Waulsortian Limestone Trial Well Schematic

Project: M02220-01 Pollboy, Ballinasloe

Site: Pollboy, Ballinasloe

Client: John Sisk & Son Ltd

Drawn By: RT | **Revision:** 00 | **Date:** 22/08/2023

APPENDIX E

SYNOPSIS NOTE

PREPARED BY MCCLOY CONSULTING

Synopsis Note

PROJECT: URMH POLLBOY, BALLINASLOE, CO GALWAY

Rev. Ref.	Date	Prep	Chk	App	Amendments	Reason for Issue
0	07/12/2023	EG	RT	RT	Original	For Information / Review

CONTENTS

INTRODUCTION AND BACKGROUND

This Synopsis Note was commissioned by John Sisk & Son Ltd to review a screening exercise and hydrogeological assessment completed at Pollboy Landfill by RPS Group.

This document should be read in conjunction with the following:

- **'Pollboy Landfill – Hydrogeological Assessment',** RPS Group, 2013;
- '**Pollboy Landfill – Request for Further Information'**, RPS Group, Sept 2015;
- **'Pollboy Landfill – Response to Query on Submission LR015480'**, RPS Group, July 2015.

SCOPE

The purpose of this service is for a synopsis of the information previously compiled by RPS Group in relation to Pollboy Landfill, Co Galway to ascertain any risks to the URMH Pollboy, Ballinasloe site.

The synopsis document reviews the screening exercise completed by RPS Group and reviews the contaminants associated with Pollboy Landfill, the likelihood of their migration to the URMH Pollboy through potential pathways, Ballinasloe site and the impacts of such.

URMH POLLBOY SITE

URMH Pollboy Site, hereafter referred to as "the site" (centroid Irish Grid M 85382 29981) is located off Pollboy Cottages, Ballinasloe, Co Galway and currently a vacant field with vegetation.

A concern was raised that Pollboy Landfill situated c.450m south of the site would impact water quality in a newly installed water abstraction well. This synopsis note will discuss the potential risks to the abstraction well sourcing from Pollboy Landfill.

POLLBOY LANDFILL BACKGROUND

The Hydrogeological Assessment (2013) completed by RPS Group noted that the landfill is located c.1.5km south of Ballinasloe, Co Galway and has been in operation since the mid-1980s. The landfill site is currently operated under Waste License W0027-02, and landfilling ceased at this location on 31st December 2005 following a court ruling.

The entire landfill covers an area of c.23ha. The landfill site is currently occupied by a civic amenity centre in operation, adjacent to the landfill site which is operated by Barna Waste.

The unlined portion of the landfill occupies an area of c.7.1ha, does not have a basal liner and was designed to operate on a dilute and disperse basis and was composed of several different waste disposal areas/cells.

The unlined section of the landfill has 11no. leachate extraction wells whereby leachate is abstracted on a continuous basis via submersible pumps (LB10, LB11, LB12, LB13, LB14, LB15, LB16, LB17, LB18, LB19 and LB20). The cut in and out of these pumps is controlled by level sensors in the boreholes, and leachate is pumped to the leachate storage lagoon via a ring main.

Furthermore, a leachate interceptor drain is located around the perimeter of the original unlined portion of the landfill to prevent lateral leachate migration offsite, which was also installed in 2002. There are 3no. pumping chambers in the interceptor drain (P2, P3 and P6) from where the leachate is pumped into the leachate lagoon. The interceptor drain was designed to lower leachate levels inside the landfill to a level below the piezometric level in the bedrock. The purpose of this was to result in an upward groundwater gradient and therefore a hydraulic barrier to leachate migrating laterally out of the landfill.

The lined portion of the landfill (Cell No 1) occupies an area of c.3.6ha. Cell No 1 was constructed using a composite lining system on the base and sides of the cell, was constructed in 2001, and is composed of a 0.5m leachate collection system (composed of 200mm diameter slotted HDPE leachate collection drains), a geotextile protection layer, a 2mm HDPE liner, and a 1m thick compacted clay soil liner with a permeability of $<1 \times 10^{-9}$ m/s placed in 4 x 250mm layers. The leachate within the line cells is collected and pumped via a rising main and pump chamber to a leachate storage lagoon.

Additionally, a pump (P7) was installed in 2008, in a chamber next to the flare compound to pump contaminated groundwater (condensate) to the leachate lagoon. All leachate and condensate from the composting facility is collected in drains and discharged to the leachate interceptor system.

All of the leachate collected at the site is pumped to the Ballinasloe Waste Water Treatment Plant (WWTP) located c.2km from the landfill, via a 90mm HDPE rising main. The leachate lagoon provides storage capacity for mixing of the leachate prior to discharge to the WWTP, and also emergency storage in the event of leachate being unable to be pumped for treatment.

TECHNICAL ASSESSMENT

Location & Topography

RPS Group noted that the natural ground level in the vicinity of the landfill ranges from 37m to 39mOD. There are a number of localised high points to the north and south of the site c.80m to 90mOD, which control the surface water drainage and they also noted that they are likely to influence the groundwater flow direction. The maximum height of the capped waste body is c.54.5mOD.

The elevation on the URMH Pollboy site ranges from c.47mOD at the site's southeastern corner rising c.53mOD in the western portion of the site, with the elevation of the abstraction well noted at c.53mOD. The closest point of the Pollboy Landfill boundary is c.37mOD, and therefore the landfill is naturally downgradient of the site and so there's no topographical connection to the site.

Regional Hydrogeology

RPS Group noted in their Hydrogeological Assessment (2013) that the permeability of the bedrock decreases rapidly with depth and transmissivity is expected to be low and expected to be in the range of 2 – 20m^2/d. the majority of groundwater flow is expected to occur in the upper 15m of rock. This zone is where groundwater flow is concentrated is composed of weathered bedrock and in a connected zone up to 10m in extent beneath the weathered zone. In general, it was suspected that groundwater flow paths are short in the area.

RPS Group additionally noted that there is the potential for contaminants to migrate to shallow groundwater to vertically migrate into deeper groundwater within the bedrock aquifer. The main flow zone within the bedrock is located in the top 15m of the bedrock surface, where the hydraulic conductivity is enhanced through the development of fracturing and weathering. The groundwater in the bedrock is confined by the overlying overburden deposits, greater than 10m of low permeability deposits. The subsequent migration of leachate within the limestone bedrock will be concentrated in the top of the bedrock where the rock quality is poor and intense weathering and fracturing was reported, which will increase the potential for contaminant migration in this zone.

Therefore, as the abstraction well in relation to the URMH Pollboy site is drilled to a depth of 150m, it is unlikely that the groundwater feeding this well is entering within the upper 15m of the rock, and instead is more likely that the groundwater entering the well is from fractures and fissures deep within the aquifer system. The well was also cased to 9mbgl, in order to seal off potential contaminants within the upper layers of the bedrock aquifer.

Groundwater Levels & Flow Direction

RPS Group confirmed in their Hydrogeological Assessment (2013) that groundwater level data confirmed an overall easterly groundwater flow direction in the peat, sand and gravel layer, with the bedrock similar to the surface water drainage pattern and towards the River Suck. RPS Group measured a groundwater gradient of 0.06 in an easterly direction within the peat, 0.0043 in a north easterly direction in the bedrock aquifer, and 0.0037 in a northeast direction within the gravel layer.

Additionally, RPS Group noted that short groundwater flow paths are expected due to the low storage in the aquifer with discharge of groundwater to springs, streams or river in the area. The main discharge of groundwater is considered to be the River Suck which represents the main discharge zone in the area.

Therefore, as the URMH Pollboy Site is situated to the north of the Pollboy Landfill, there is likely no hydraulically connection as RPS Group has confirmed groundwater level data is in an overall easterly direction within the overburden layer, and in a north easterly direction within the bedrock aquifer.

CONCLUSION

In conclusion, the URMH Pollboy site is considered to be naturally upgradient of the Pollboy Landfill, and therefore it is not considered that the landfill will impact the URMH Pollboy Site via surface water flow or topographically.

As the abstraction well at the Pollboy Site is drilled to 150mbgl, with casing to 9mbgl and plain pipe installed to 25mbgl grouted into place, and therefore, groundwater is only entering the abstraction well system from below 25mbgl. As a result, it is considered unlikely that the well is fed from the upper 15m of the bedrock aquifer, and it is more likely the well is fed via fracture flow deep within the bedrock aquifer. Additionally, as the Pollboy Landfill exhibits low permeability overburden deposits, coupled with the evidence of short groundwater flow paths, it is considered highly unlikely that the landfill is affecting the Pollboy Site.

Pollboy Landfill groundwater flow direction was confirmed to be in a northeasterly/easterly direction, and therefore not flowing in the direction of the site (north) and so it is considered to be not hydraulically connected to the site/abstraction well.