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Natura Impact Statement

PRESENTED TO

Milford Quarries Limited
Bannagagole, Old Leighlin, Co. Carlow

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Environmental Consultancy Services

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1 INTRODUCTION

1.1 Background

Enviroguide Consulting was commissioned by Milford Quarries Limited, to prepare an Appropriate Assessment (AA) Screening Report in respect of a Proposed Quarry Development (the 'Proposed Development') at a c. 9.34 hectare site at Bannagagole, Old Leighlin, Co. Carlow (the 'Site)'. The AA Screening Report concluded that a degree of uncertainty exists that the Proposed Development may give rise to potentially significant effects on **River Barrow and River Nore SAC (002162)**.

Therefore, this Natura Impact Statement (NIS) has been prepared to provide information for the relevant competent authority to enable it to carry out a Stage 2 AA in respect of the Proposed Development.

1.2 Quality Assurance and Competence

Enviroguide Consulting is multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All Enviroguide consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. SOB undertook the desktop research and authored this report.

SOB has a B.A. in Zoology from Trinity College Dublin and a M.Sc. Hons. in Wildlife Conservation and Management from University College Dublin, and has experience in desktop research, report writing, and literature scoping-review, as well as practical field and laboratory experience (Pollinator surveying, sampling and identification, habitat surveying, invasive species surveying, etc.). SOB has prepared Stage I and Stage II Appropriate Assessment (AA) Reports, Invasive Species Surveys, Ecology Statements, Ecological Impacts Assessments (EcIAs), and Biodiversity Chapters of Environmental Impact Assessment Reports (EIARs).

1.3 Description of the Proposed Development

1.3.1 Site Location

The Site of the Proposed Development, as shown in Figure 1, is 9.34ha, and is located immediately to the south of an existing limestone bedrock quarry at Bannagagole (Old Leighlin Quarry), approximately 745m northwest of the M9. The L3036 abuts the east of the Site, with agricultural land bordering the remaining boundaries of the Site. The surrounding landscape is predominantly agricultural in nature, with a number of detached dwellings throughout.

1.3.2 Description of Proposed Development

The Applicant intends to apply for a 14-year planning permission for the demolition of existing derelict buildings and the development of a quarry at the Site of 9.34 hectares.

The Proposed Development includes the following principal elements:

- Demolition of existing derelict buildings and the development of a quarry with a projected lifetime of c. 12 years with an additional 1-year permission to allow for the implementation of a restoration plan at the Site.
- The proposed quarry void will be extracted to a depth of 2 no. benches of c. 10m from top of bedrock, with a final floor level of c. 46.5m above ordnance datum (AOD) with a proposed rate of rock extraction of c.30,000 cubic metres (84,000 tonnes) per annum.
- A proposed working area of c. 1.2 hectares to the south of the extraction zone will provide for the crushing / processing of the unusable stone and storage of dimensional stone and will include machinery storage shed (c. 120m²), staff welfare, wastewater holding tank, weighbridge and parking area.
- The Proposed Development will also include for earthen screening berms to a height of c. 3 m, a wheelwash facility; installation of surface water attenuation and settlement ponds for the treatment of suspended solids in the floor of the quarry; soil storage area with an average storage depth of c. 3.85 m and all other site development works above and below ground including the restoration of the final quarry void (extractive area).
- Access to the Proposed Development will be facilitated by a proposed access haul road for HGV site entrance from the Local Road to the east of the Site.

This Application is made under section 34(2)(a) of the Planning and Development Act 2000, as amended, where it is acknowledged that a planning authority is restricted to considering proper planning and sustainable development with regard being had to the following matters:

i. the provisions of the development plan,

ii. the provisions of any special amenity area order relating to the area,

iii. any European site or other area prescribed for the purposes of section 10(2)(c),

iv. where relevant, the policy of the Government, the Minister or any other Minister of the Government,

v. the matters referred to in subsection (4), and

vi. any other relevant provision or requirement of this Act, and any regulations made thereunder.

1.3.2.1 Operational Phase

There are 3 main elements to the construction and operation of a dimension stone quarry at the Old Leighlin site.

1. Stripping of overburden

a. Vegetal and soil/subsoil removal is required during the Construction Phase of the Proposed Development. The extraction area will be stripped of c. 158,928m³ of overburden to a depth c. 4 metres. A portion of this overburden will be utilised in the construction of berms surrounding the extraction area, while the remainder is intended to be held in a soil storage area to the west of the extraction zone. The proposed soil storage area will cover an area of c.3.56 ha and hold a volume of 150,000m³ of material to an average depth of 4.2m. The soil storage area will be filled in 2 main phases as outlined on drawing P1591-0-1209-A3-PP09-00A prepared by Hydro Environmental Services and accompanying this application.

2. Removal of unusable stone

    a. On the basis of the geophysical surveys carried out at the Site, the usable dimensional limestone is at a typical depth of c. 10 metres. As part of the initial Operational Phase, a layer of unusable stone of approximately 6 metres in depth will require extraction prior to reaching the quality dimensional stone. It is intended to include a working area to the south of the extraction zone (c. 1.2 ha) to provide for the crushing processing of the unusable stone. This working area will include parking, staff canteen welfare building, weighbridge, and stockpile area. Crushed / processed unusable stone will be transported offsite.

3. Extraction of Dimensional Limestone

    a. Once usable dimensional stone beds are exposed, as part of the Operational Phase of the quarry, these will be cut into blocks using a diamond tipped chain or diamond wire saws. When the large blocks of dimensional limestone are cut they are pushed off the beds using steel bags that are filled with high pressure water. This provides the space for hooks to be inserted and for the blocks to be lifted away by an excavator. It is expected that dimensional stone beds will be extracted in 4 distinct phases as outlined in Figure 3 - Figure 10. An initial bench will be extracted from the eastern extent of the extraction area in a westerly direction. Phase 2 will involve extraction of stone from the southern extent of the extraction area in a northerly direction. It is expected that a second bench will be extracted in 2 phases in a similar manner.

    b. Usable dimensional stone blocks extracted from the quarry will be immediately transported offsite for processing elsewhere.

1.3.2.2 Surface Water

The proposed surface water management plan for the Proposed Development has been designed to ensure that there is no release of silt or elevated concentrations of suspended solids to local surface watercourses as a result of the Proposed Development. The surface water management plan includes the provision of silt traps, and is detailed in Section 8.4 and Section 8.6.1.3 of the EIAR. For clarity, the proposed water management system is summarised below.

Firstly, the main principle of the proposed surface water management plan is to 'keep clean water clean' by avoiding unnecessary disturbance to existing drainage features and diverting clean surface water flows around excavations, construction areas and storage areas through

the use of interceptor drains. The second method involves collecting any surface water run-off from excavation or work areas and routing this water through the new proposed water management system to release into a small roadside drain which in turn flows into the Baunleath Stream. There will be no release of untreated water during the Construction or Operational Phase of the Proposed Development.

1.3.2.2.1 Construction Phase:

Prior to the commencement of earthworks, silt traps (i.e. silt fences) will be placed down-gradient of the construction areas where surface water may drain to local watercourses including the Baunleath Stream and/or other small drainage ditches. These silt fences will be embedded into the local soils to ensure that all site water is captured and filtered. This will ensure that there is no discharge of elevated concentrations of suspended solids to local watercourses. Temporary settlement ponds can be used during the earthworks phase to allow treatment of surface water run-off.

1.3.2.2.2 Operational Phase:

During the Operational Phase, the proposed water management system will direct all surface water within the quarry void and any minor groundwater inflows towards a suitably designed settlement lagoon (i.e. quarry sump) on the quarry floor. Any run-off from the proposed soil storage areas will also be directed into the quarry void via collector drains. The temporary sump on the quarry floor will provide attenuation of run-off whilst also providing treatment in the form of the settlement of suspended solids.

Water from the temporary sump of the quarry floor will then be pumped to the main settlement pond / water storage area. This pond will be adequately designed to provide for the settlement of clays and fine sediment particles prior to release.

There will be no discharge of untreated surface water during the Operational Phase of the proposed development. There is no requirement for any additional water treatment for suspended solids.

As outlined in the Hydrology Chapter of the Environmental Impact Assessment Report (EIAR) accompanying this application, other parts of the surface water drainage system includes :

- A series of land drains are proposed below the soil storage area, and these will flow to an open drain along the eastern edge of the soil storage area. Any surface water run-off from this area will be directed into the quarry void and managed via the quarry water management system.
- The set down area will have a hardcore surface, part of which also drains into the quarry void. The southern half of the set down has bounding collection drains, which will be filled with drainage stone (i.e. French drains), and any excess surface water arising from these French drains will discharge to the ground via a proposed soakaway.
- Within the quarry void, both surface water and groundwater will be collected and pumped from temporary sumps to the main settlement pond. Water within the settlement pond will then drain via gravity and flow through a hydrocarbon interceptor, and discharge to a drain at the north-eastern corner of the site. The drain flows via a culvert under the L3036 towards the Baunleath Stream, which discharges to the Madlin River 2km northeast of the site. A discharge licence will be required.

- Surface water drainage from the main access road will be collected in a roadside filter drain, and excess water will flow through a hydrocarbon interceptor and recharge to groundwater in a soakaway at the southeast of the Site.
- ACO drains, long narrow drains covered in grating, are proposed across the Site entrance. The ACO drain closest to the entrance gate will drain into the filter drain/hydrocarbon interceptor/soakaway network outlined above. The second ACO drain prevents run-off from the site entrance area onto the public road and will direct water to the south into a French drain/linear soakaway located inside the Site boundary.
- The Proposed Development will require discharge of surface water and a small amount of groundwater as the proposed quarry void intersects the local groundwater table. Similar to the existing quarry (to the north), there is likely to be little groundwater inflows to the quarry except for water entering from the upper weathered bedrock. Excess water can be stored in the quarry floor, so discharge can be limited/attenuated to ensure no impacts on the downstream receiving waters.

1.3.2.3 Restoration Phase

The Restoration Plan Objectives are to create a natural habitat throughout the Site, which is one of the beneficial after uses proposed in the EPA Guidelines: *"Environmental Management in the Extractive Industry (2008)"*.

On completion of all quarry activities, the following will be undertaken:

1. Remove all remaining stone and materials from the storage/processing yard and place them in the base of the quarry void.
2. Leave the cleared areas for natural recolonisation.
3. All structures will be cleared and removed from site.
4. The quarry void will be left to naturally infill with groundwater, which will likely settle at around ~70m AOD.
5. Spoil material from the perimeter berms will be placed in the eastern section of the quarry void and will be used to create a gradual sloping shoreline, and also to place spoil on residual quarry benches to foster a variety of wildlife.
6. The definition of post and wire fence to secure waterfilled quarry void.

A Native Planting Mix is considered, following these indications:

- Hedging to be planted as a double staggered row, with plants within each row 40cm apart (i.e. 5 plants per m). Rows to be 0.5m apart.
- Planting in same species groups of 5-10 and transplants to be supplied with spiral guards.
- Planting mix should be equal amounts of silver birch (*Betula pendula*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), willow (Salix sp.) and rowan (*Sorbus acuparia*).
- Also, gorse (*Ulex europaeus*) will be encouraged to grow on the elevated section along the western boundary and on the soil storage area. This may colonise naturally and will also be introduced via seed.

Most of the northern, eastern and south-eastern existing hedgerows are kept within the Proposed Development.

The installation of the new green structure will partly compensate for the existing vegetation that will be removed.

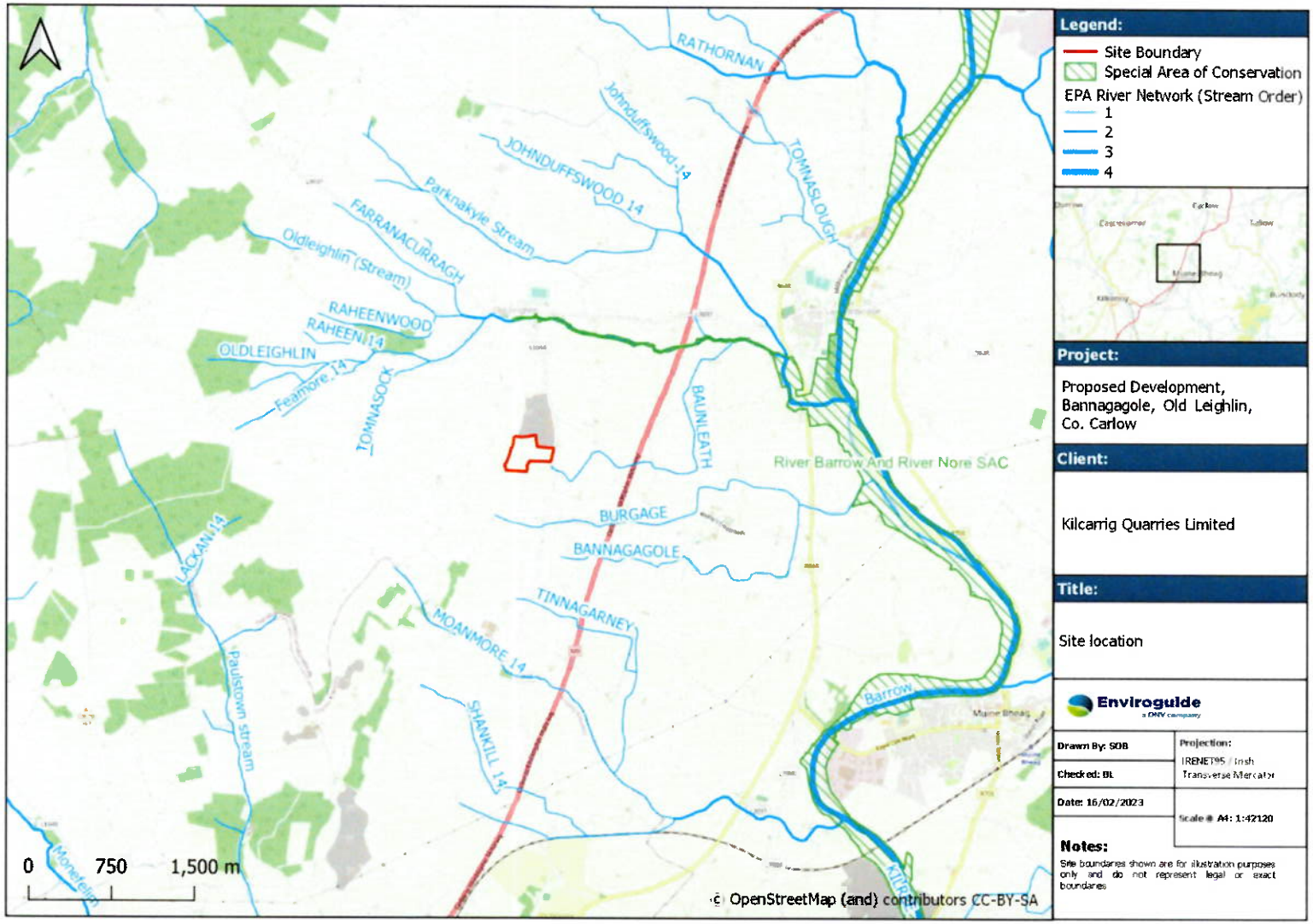

FIGURE 1. SITE LOCATION.

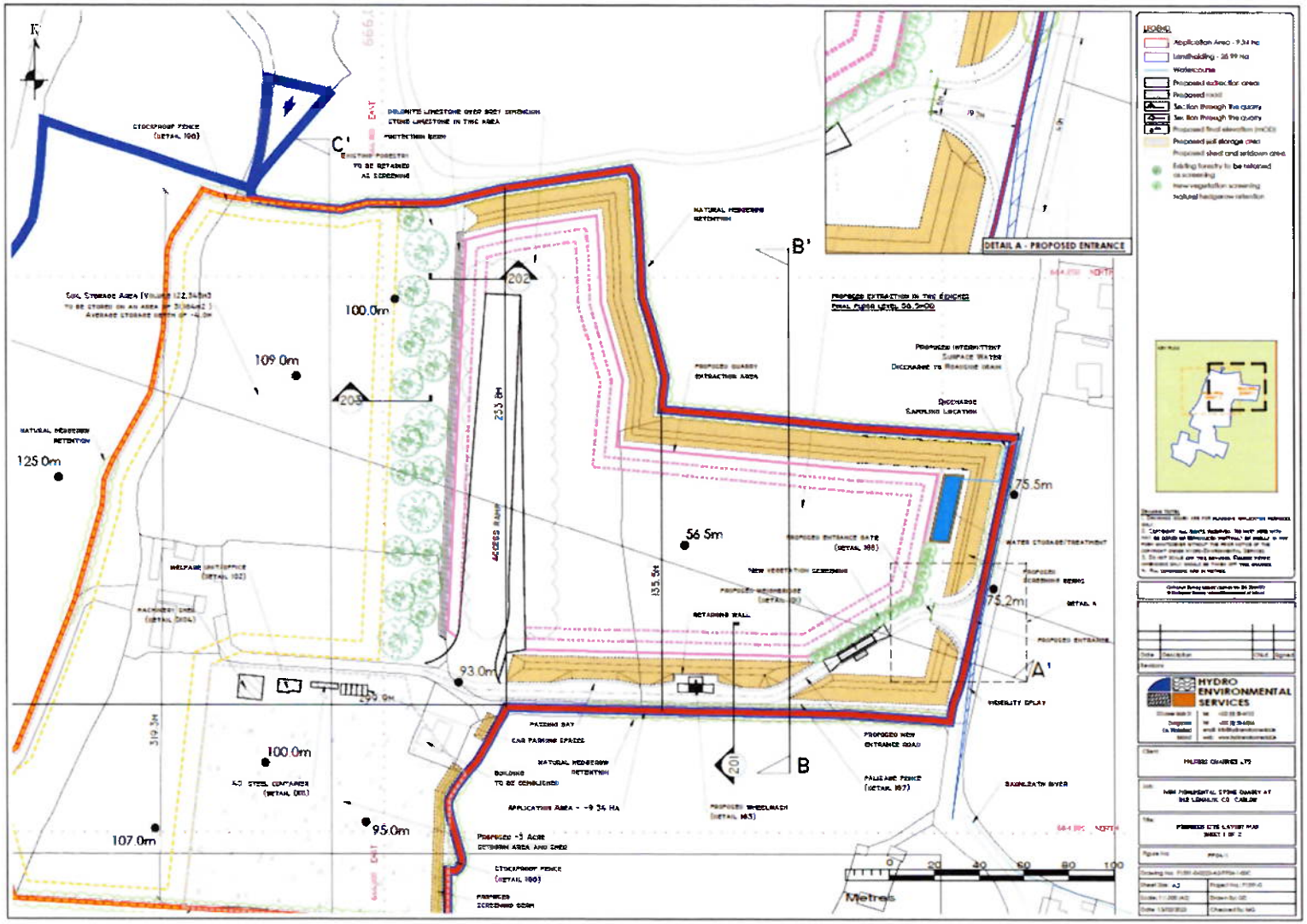

FIGURE 2. PROPOSED SITE LAYOUT – GROUND FLOOR (HYDROENVIRONMENTAL SERVICES, 2023).

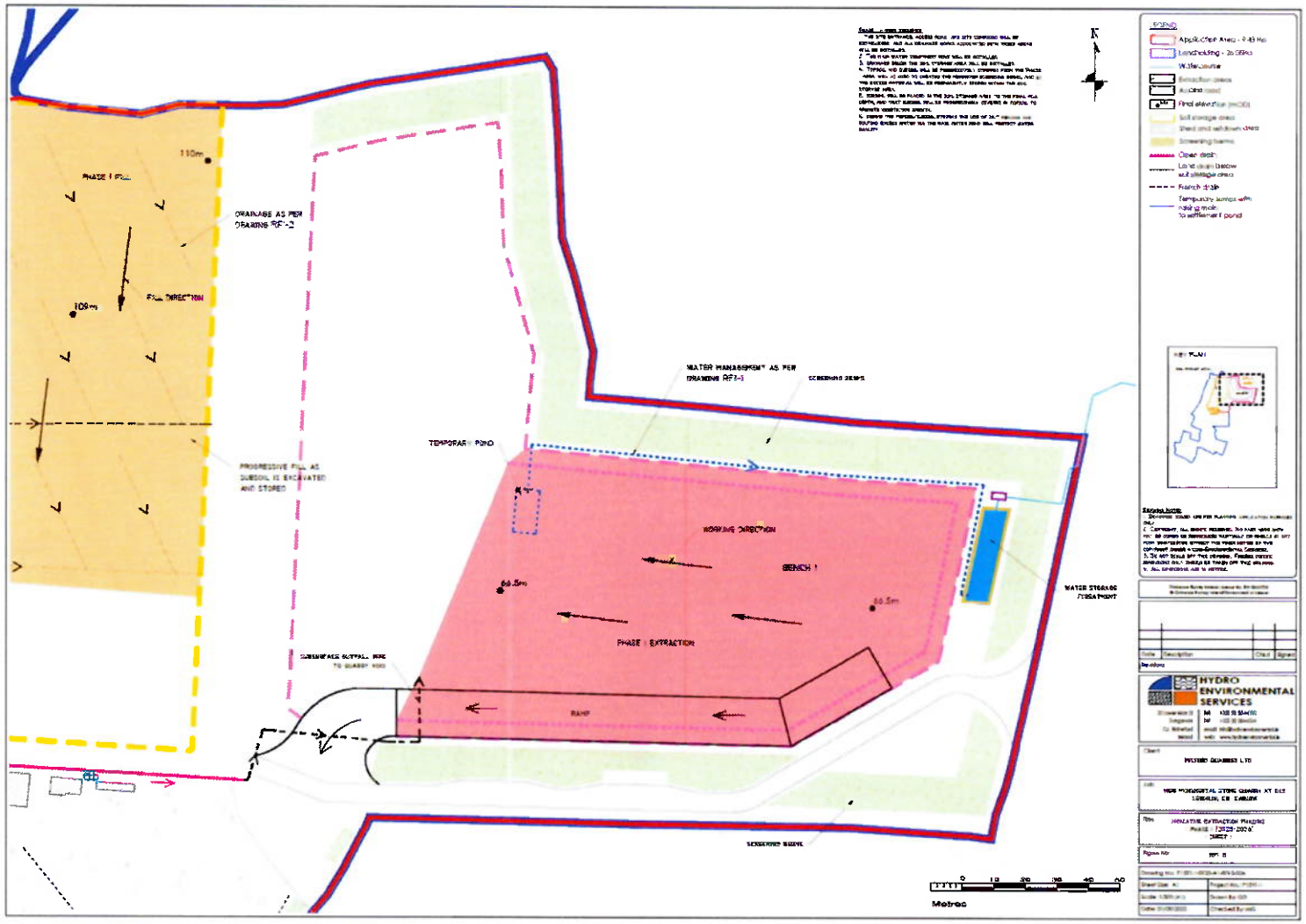

FIGURE 3. INDICATIVE EXTRACTION PHASING – PHASE 1 (2023 – 2026) IN THE EAST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-3-00A (HYDROENVIRONMENTAL SERVICES, 2023)

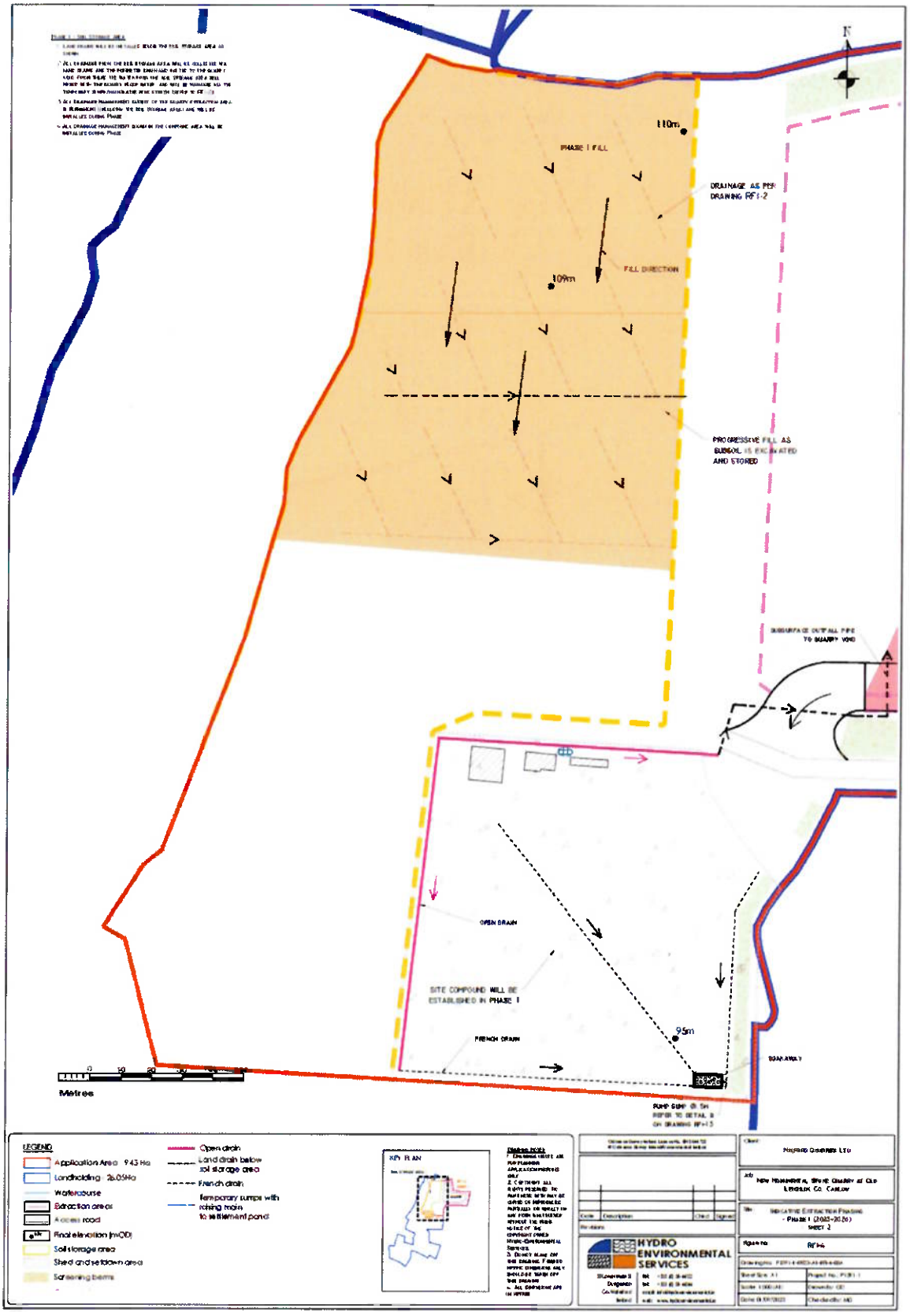

FIGURE 4. INDICATIVE EXTRACTION PHASING – PHASE 1 (2023 – 2026) IN THE WEST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-4-00A (HYDROENVIRONMENTAL SERVICES, 2023)

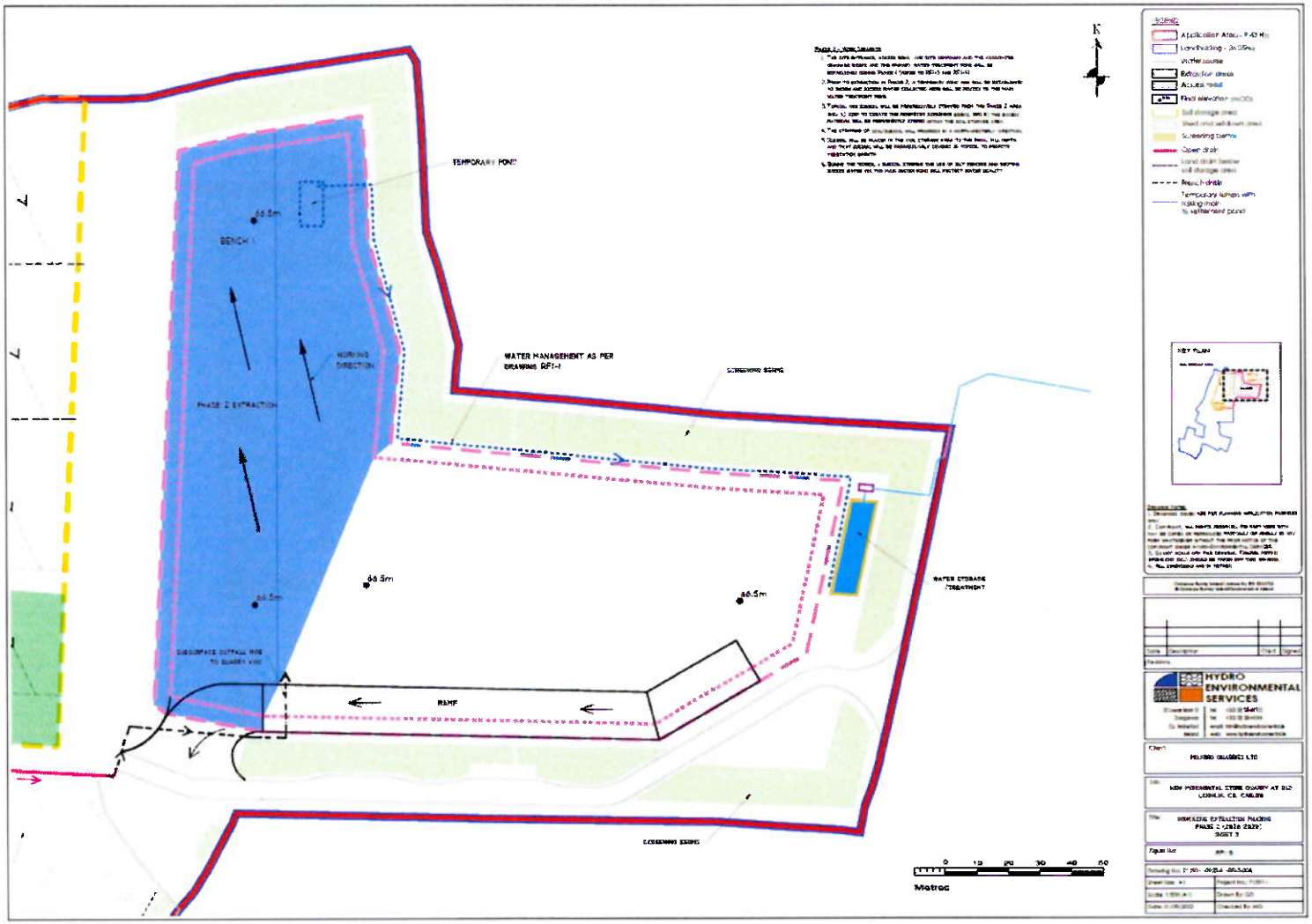

FIGURE 5. INDICATIVE EXTRACTION PHASING – PHASE 2 (2026 – 2029) IN THE EAST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-5-00A (HYDROENVIRONMENTAL SERVICES, 2023)

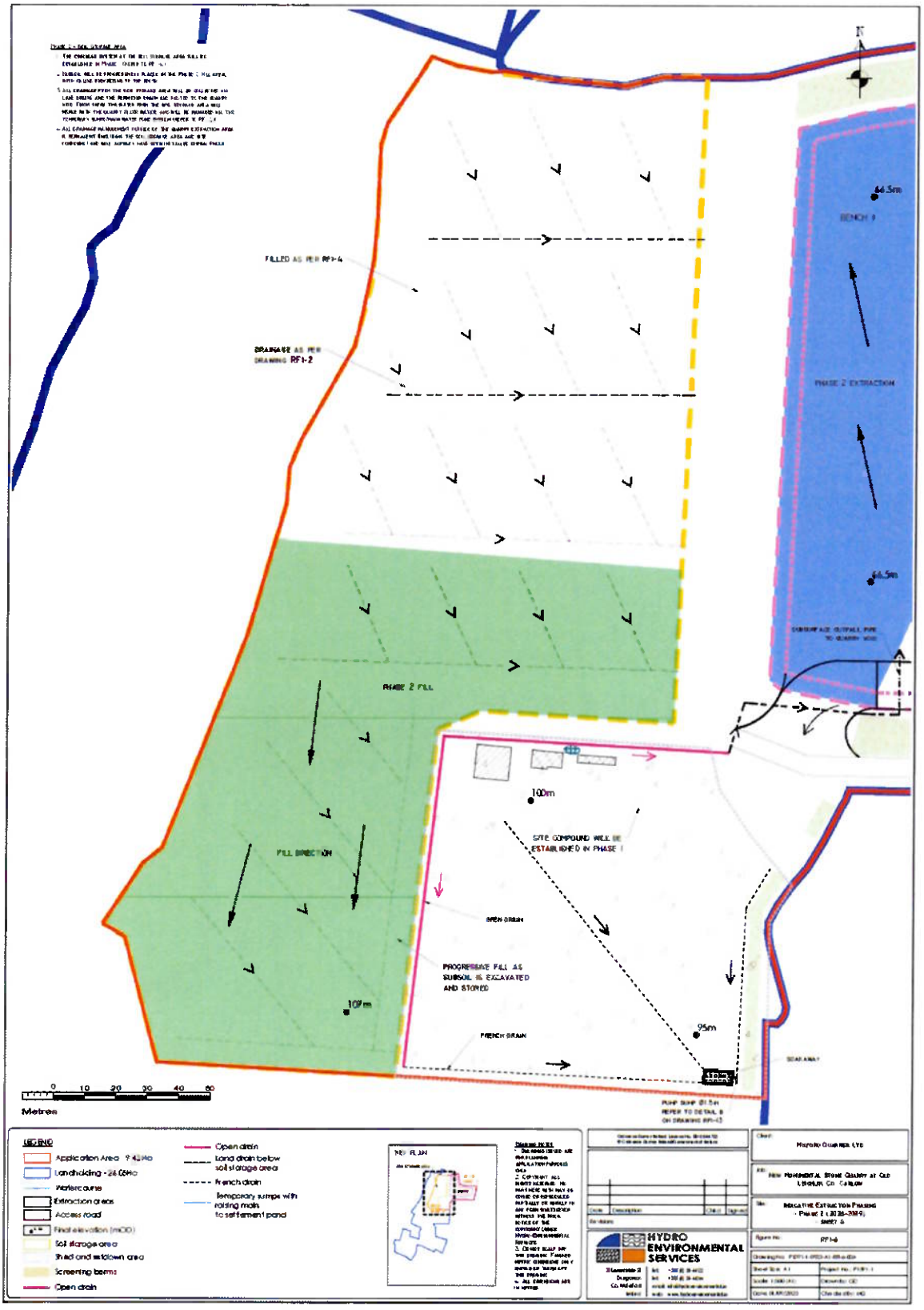

FIGURE 6. INDICATIVE EXTRACTION PHASING – PHASE 2 (2026 – 2029) IN THE WEST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-6-00A (HYDROENVIRONMENTAL SERVICES, 2023)

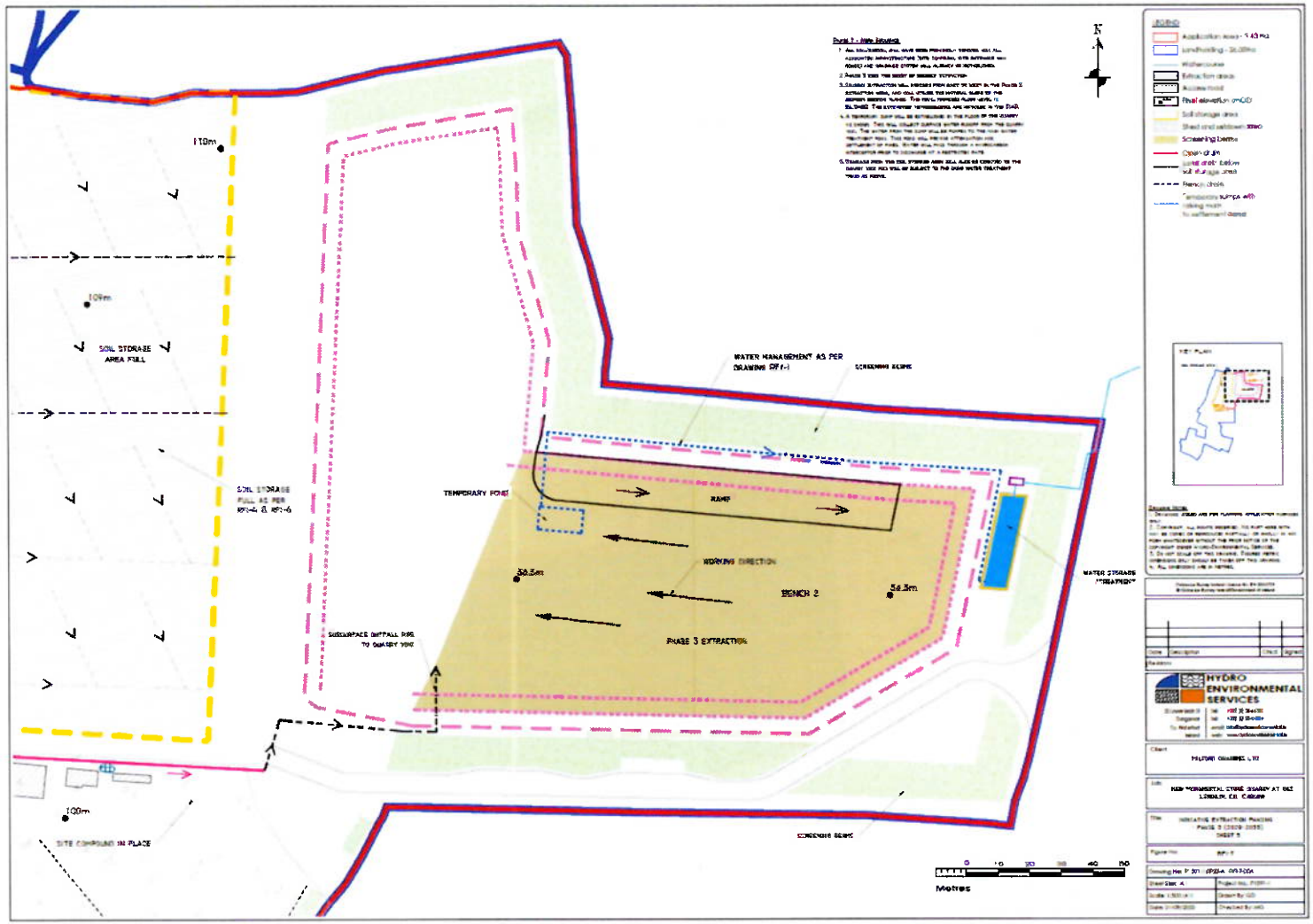

FIGURE 7. INDICATIVE EXTRACTION PHASING – PHASE 3 (2029 – 2033) IN THE EAST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-7-00A (HYDROENVIRONMENTAL SERVICES, 2023)

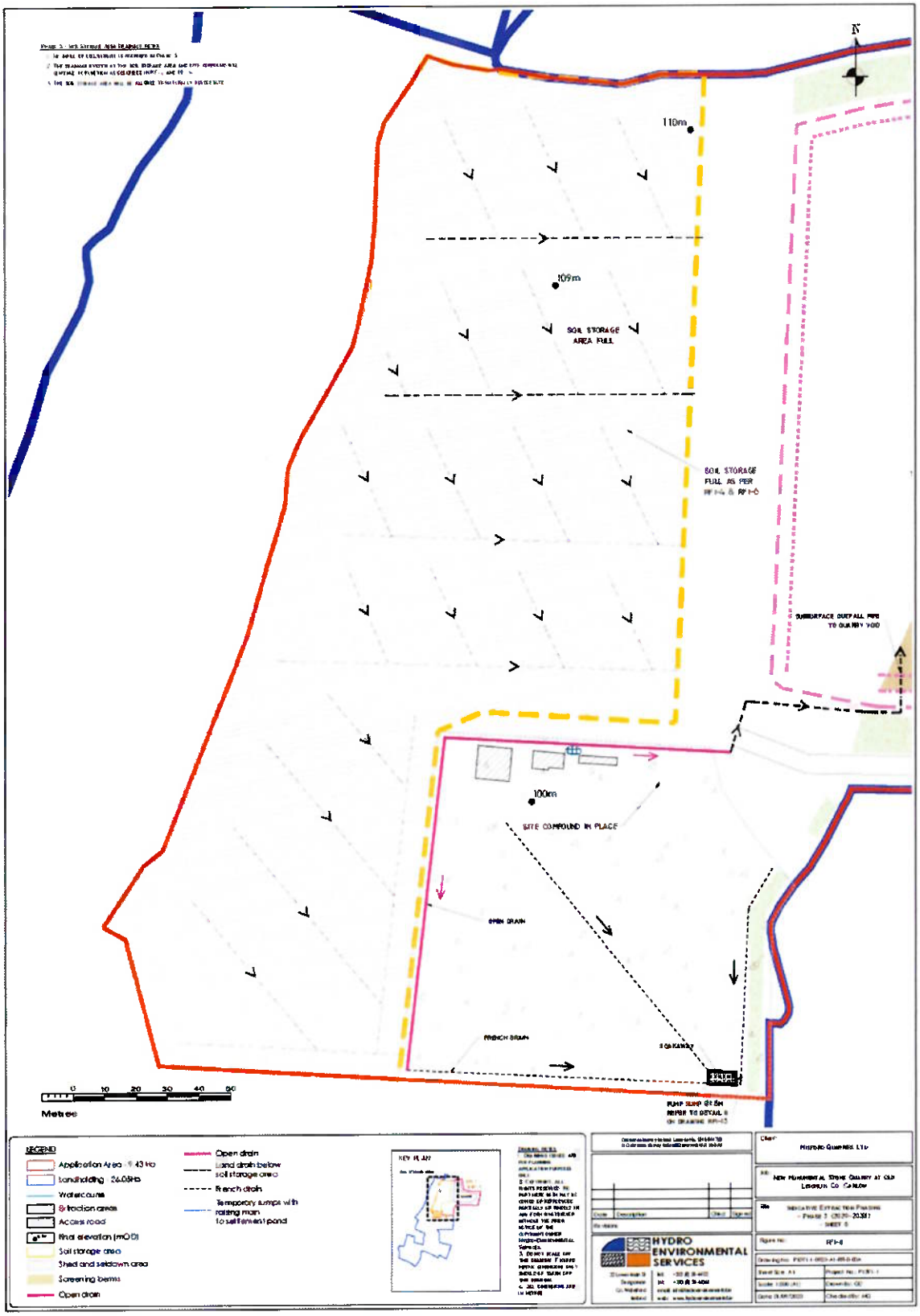

FIGURE 8. INDICATIVE EXTRACTION PHASING – PHASE 3 (2029 – 2033) IN THE WEST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-8-00A (HYDROENVIRONMENTAL SERVICES, 2023)

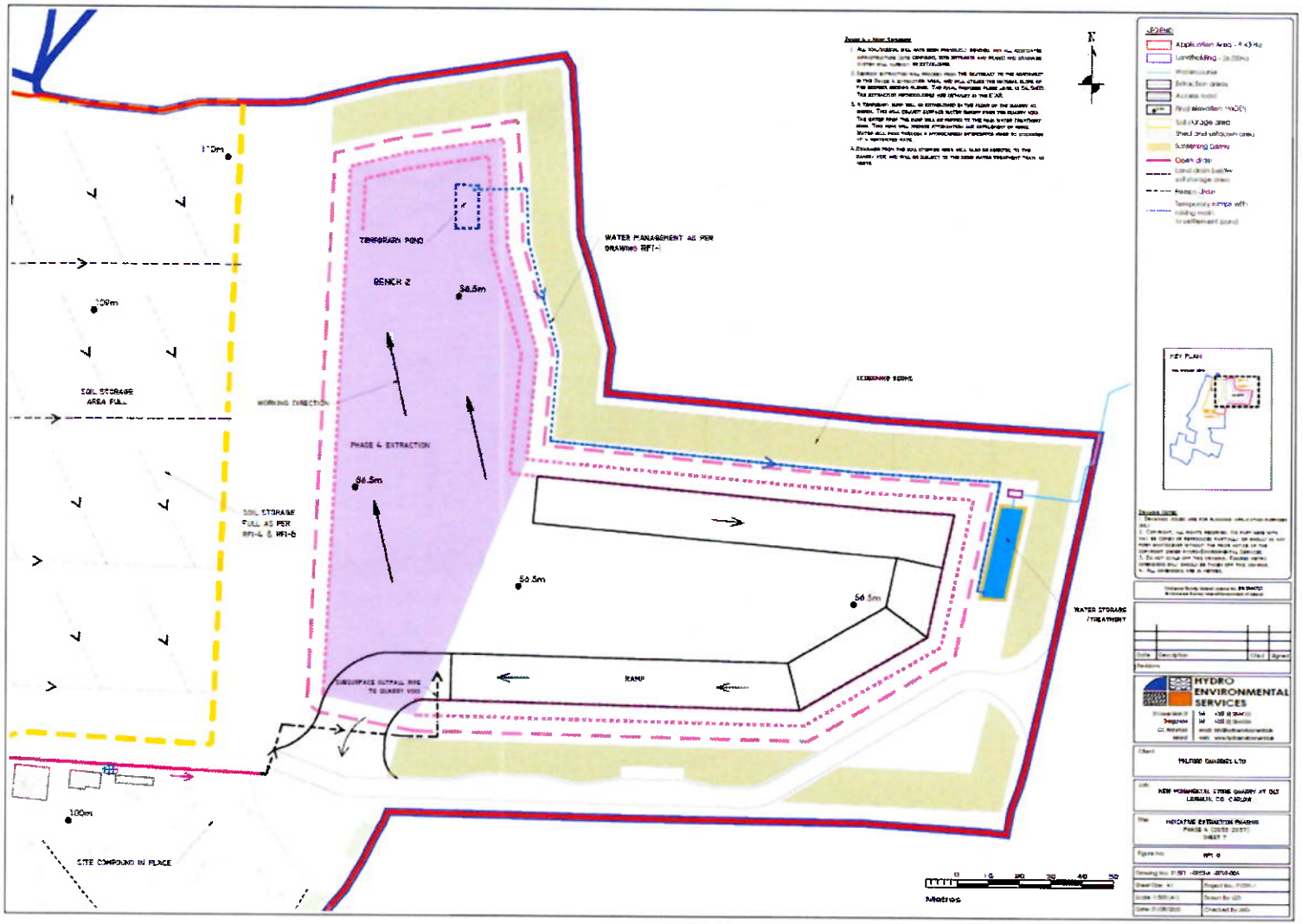

FIGURE 9. INDICATIVE EXTRACTION PHASING – PHASE 4 (2033 – 2037) IN THE EAST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-9-00A (HYDROENVIRONMENTAL SERVICES, 2023)

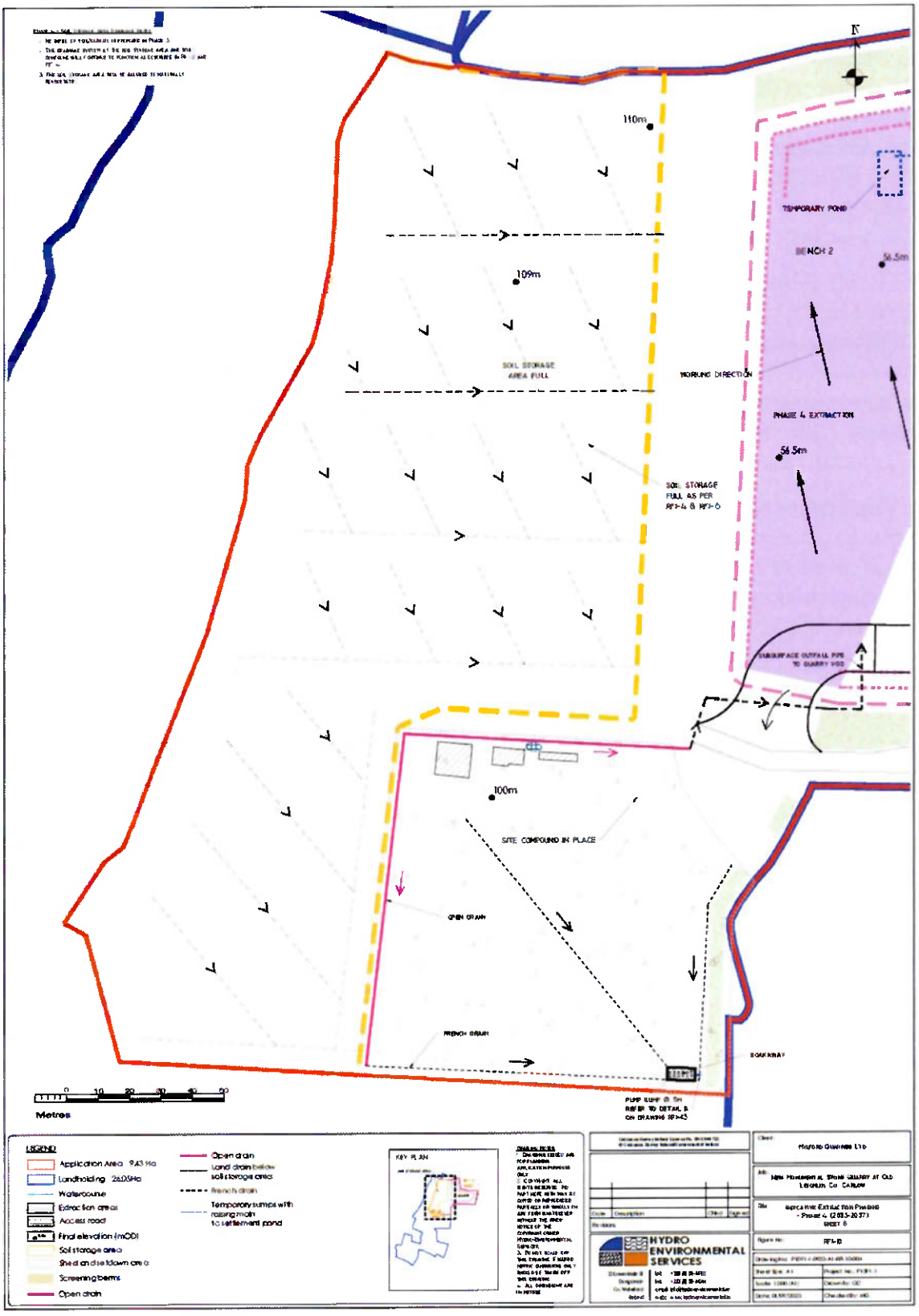

FIGURE 10. INDICATIVE EXTRACTION PHASING – PHASE 4 (2033 – 2037) IN THE WEST AREA OF THE SITE. DRAWING NO. P1591-1-0923-A1-RFI-10-00A (HYDROENVIRONMENTAL SERVICES, 2023)

1.4 Legislative Background

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community.

SACs and SPAs are collectively known as "Natura 2000" or "European" sites. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the Qualifying Interests (QIs) and Special Conservation Interests (SCIs) of the sites; from these the conservation objectives of the site are derived.

An 'Appropriate Assessment' (AA) is an assessment required prior to the grant of planning permission to determine whether a plan or project, based on best scientific knowledge, will have an adverse effect on the integrity of a European site, either alone or in combination with other plans and projects. It is required for any plan or project not directly connected with or necessary to the management of a site but likely to have a significant effect on it.

An AA is required under Article 6 of the Habitats Directive where a project or plan may give rise to significant effects upon a Natura 2000 site. Paragraph 3 states that:

"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 subject to appropriate assessment of its implications for the site, in view of the site's conservation objectives. In the 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."

According to the ruling delivered in open court in Luxembourg on 15th June 2023 regarding the interpretation of Article 6(3) of Directive 92/43, the Article must be interpreted as meaning that:

"In order to determine whether it is necessary to carry out an appropriate assessment of the implications of a plan or project for a site, account may be taken of the features of that plan or project which involve the removal of contaminants and which therefore may have the effect of reducing the harmful effects of the plan or project on that site, where those features have been incorporated into that plan or project as standard features, inherent in such a plan or project, irrespective of any effect on the site".

As such, standardised embedded mitigation (such as the use of Sustainable Drainage Systems (SuDS) in large-scale residential developments), that are incorporated into the design of a proposal or project and which may result in a reduction of effects impacting

European sites, but where the primary reason of the embedded mitigation is not to protect a European site, are permitted for consideration during the undertaking of AA.

1.4.1 Legislative Context

The obligations in relation to Appropriate Assessment have been implemented in Ireland under Part XAB of the Planning and Development Act 2000, as amended ("the 2000 Act"), and in particular Section 177T and Section 177V thereof in relation to Natura Impact Statements and Appropriate Assessment. The relevant provisions of Section 177T and 177V are set out below:

"***177T.—*** *(1) In this Part— (a) A Natura impact report means a statement for the purposes of Article 6 of the Habitats Directive, of the implications of a Land use plan, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.*

(b) A Natura impact statement means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.

(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites."

(3) ...

(4) The applicant for consent for proposed development may, or if directed in accordance with subsection (5) by a competent authority, shall furnish a Natura impact statement to the competent authority in relation to the proposed development.

(5) At any time following an application for consent for proposed development a competent authority may give a notice in writing to the applicant concerned, directing him or her to furnish a Natura impact statement.

(6) ...

(7) (a) Without prejudice to subsection (1) a Natura impact report or a Natura impact statement shall include all information prescribed by regulations under section 177AD .

(b) Where appropriate, a Natura impact report or a Natura impact statement shall include such other information or data as the competent authority considers necessary to enable it to ascertain if the draft Land use plan or proposed development will not affect the integrity of the site."

"177V.— *(1) An appropriate assessment carried out under this Part shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority, in each case where it has made a determination under section 177U(4) that an appropriate assessment is required, before—*

(a) the draft Land use plan is made including, where appropriate, before a decision on appeal in relation to a draft strategic development zone is made, or

(b) consent is given for the proposed development.

(2) In carrying out an appropriate assessment under subsection (1) the competent authority shall take into account each of the following matters:

(a) the Natura impact report or Natura impact statement, as appropriate;

(b) any supplemental information furnished in relation to any such report or statement;

(c) if appropriate, any additional information sought by the authority and furnished by the applicant in relation to a Natura impact statement;

(d) any additional information furnished to the competent authority at its request in relation to a Natura impact report;

(e) any information or advice obtained by the competent authority;

(f) if appropriate, any written submissions or observations made to the competent authority in relation to the application for consent for proposed development;

(g) any other relevant information.

(3) Notwithstanding any other provision of this Act, or, as appropriate, the Act of 2001, or the Roads Acts 1993 to 2007 and save as otherwise provided for in sections 177X, 177Y, 177AB and 177AC, a competent authority shall make a Land use plan or give consent for proposed development only after having determined that the Land use plan or proposed development shall not adversely affect the integrity of a European site.

(4) Subject to the other provisions of this Act, consent for proposed development may be given in relation to a proposed development where a competent authority has made modifications or attached conditions to the consent where the authority is satisfied to do so having determined that the proposed development would not adversely affect the integrity of the European site if it is carried out in accordance with the consent and the modifications or conditions attaching thereto."

1.5 Policy Context

1.5.1 Carlow County Development Plan 2022-2028

While the County Development Plan in its entirety is relevant to this Development and can be referred to separately, policies and objectives of the Carlow County Development Plan (CDP) 2022-2028 that are of particular relevance to this Screening Report are outlined below:

- **Policy NSP1:** "*Support the conservation and enhancement of Natura 2000 Sites, and to protect the Natura 2000 network from any plans and projects that are likely to have a significant effect on the coherence or integrity of a Natura 2000 Site, in accordance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.*"
- **Policy NSP2:** "*Screening for Appropriate Assessment and if required Appropriate Assessment is undertaken for all plans to be adopted and projects to be granted*

permission/authorised by the Council. Where likely significant effects have been identified in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site, either individually or in combination with other plans or projects, ensure appropriate assessment, in accordance with Article 6(3) of the Habitats Directive. The Council shall only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned, unless the plan or project is subject to the provisions of Article 6(4) of the Habitats Directive."

- **Policy NSP3:** "*Consider impacts within a plan or project's zone of influence, which may include Natura 2000 sites outside the County, when assessing whether a plan or project is likely to have significant effects on Natura 2000 sites.*"
- **Policy NSP4:** "*Maintain or restore the favourable conservation status of County's Natura 2000 sites qualifying interest habitats and species.*"
- **Objective NSO1:** "*Strictly protect areas designated or proposed to be designated as Natura 2000 sites, including any areas that may be proposed for designation or designated during the period of this Plan.*"

1.5.2 Carlow Biodiversity Action Plan (Draft)

The draft Carlow Biodiversity Action Plan (BAP) 2023-2028 is set out to protect and improve biodiversity through six objectives:

- **Objective 1:** To map and conserve what is valuable.
- **Objective 2:** To rehabilitate where possible.
- **Objective 3:** To enhance where possible.
- **Objective 4:** To adopt Biodiversity friendly policies.
- **Objective 5:** To improve the understanding of stakeholder's roles in biodiversity conservation.
- **Objective 6:** To strengthen existing, and develop new, partnerships to deliver the above actions.

1.6 Stages of Appropriate Assessment

The AA process is a four-stage process. Each stage requires different considerations, assessments and tests to ultimately arrive at the relevant conclusion for 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.

The four stages of an AA, can be summarised as follows:

- **Stage 1: *Screening***. The Screening for AA considers whether a plan or project is directly connected to or necessary for the management of a European site, or whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

- **Stage 2: *Natura Impact Statement (NIS).*** Where Stage 1 determines that significant effects are likely, uncertain or unknown, the preparation of a NIS is required. The NIS must include a scientific examination of evidence and data to classify potential impacts on any European site(s) in view of their conservation objectives in the absence of mitigation. The NIS will identify appropriate mitigation to remove the potential for likely significant adverse effects on any European site(s). If the competent authority

determines that the plan or project would have an adverse effect on the integrity of any European site(s) despite mitigation, it can only grant consent after proceeding through stages 3 and 4.

- **Stage 3: *Assessment of alternative solutions***. If the outcome of Stage 2 is negative i.e., adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned. This stage examines alternative solutions to the proposal.

- **Stage 4: *Assessment where no alternative solutions exist and where adverse impacts remain***. The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a European site, where no less damaging solution exists.

The Habitats Directive promotes a hierarchy of avoidance, mitigation, and compensatory measures. First the project should aim to avoid any negative effects on European sites by identifying possible effects early in the planning stage and designing the project to avoid such effects. Second, mitigation measures should be applied, if necessary, during the AA process to the point where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, a refusal for planning permission may be recommended. In this case, the project will generally only be considered where no alternative solutions are identified and the project is required for IROPI, or, in the case of priority habitats, considerations of health or safety, or beneficial consequences of primary importance for the environment or to other IROPI. Then compensation measures are required for any remaining adverse effects.

1.7 Stage 1: Appropriate Assessment Screening Conclusion

An AA Screening Report was prepared for the Proposed Development by Enviroguide Consulting in March 2023.

The conclusion of the AA Screening Report is as follows:

"The Proposed Development at Bannagagole, Old Leighlin, Co. Carlow has been assessed taking into account:

- *The nature, size and location of the Proposed Development and possible impacts arising from the construction works.*
- *The QIs and conservation objectives of the European sites.*
- *The potential for in-combination effects arising from other plans and projects.*

Upon examination of the relevant information including in particular the nature of the Proposed Development and the likelihood of significant effects on European sites, the possibility may not be excluded that the Proposed Development will have a likely significant effect on the European site listed below:

- *River Barrow and River Nore SAC (002162)*

Accordingly, a NIS has been prepared for the Proposed Development and is included under separate cover."

As such, this NIS will assess the potential effects of the Proposed Development on **River Barrow and River Nore SAC (002162)**.

This European site is linked to the Proposed Development via hydrological and hydrogeological pathways.

2 NIS METHODOLOGY

2.1 Guidance

This NIS has been undertaken in accordance with the following guidance:

- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities.* (Department of Environment, Heritage and Local Government, 2010 revision);
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.* Circular NPW 1/10 & PSSP 2/10;
- *Communication from the Commission on the precautionary principle* (European Commission, 2000);
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2019);
- *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 (*European Commission, 2021*)*;
- *Appropriate Assessment Screening for Development Management, OPR Practice Note PN01, Office of the Planning Regulator March 2021;* and
- *Amendments to section 42 of the Planning and Development Act 2000, as amended and associated Planning and Development Regulations 2001. Department of the Environment, Heritage and Local Government. (2021). Circular Letter: EUIPR 01/2021.*

2.2 NIS Steps

This NIS has been prepared following the steps described below:

- Description of the baseline existing environment at the Site of the Proposed Development;
- Review and description of available data for the relevant European site(s) potentially affected as identified in the Screening Report (Enviroguide 2023);
- Identification and description of potential effects on the relevant European site(s) and their designated QIs/SCIs;
- Assessment of the likely significance of the effects and/or impacts identified on the relevant QIs/SCIs in view of their Site Specific Conservation Objectives (SSCOs) where available;

- Description and characterisation of other projects or plans that in combination with the Proposed Development have the potential for having significant effects on the relevant QIs/SCIS;
- Identification of appropriate mitigation measures to remove the likelihood of significant effects on any European site(s) and their QIs/SCIs; and
- Exclusion of sites where it can be objectively concluded that there will be no significant effects once mitigation measures are adhered to.

2.3 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources relevant for the completion of the NIS. The desk-top study, completed in February 2024, relied on the following sources:

- Information on the network of European sites, relevant boundaries, QIs and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie and the European Environment Agency (EEA) at https://natura2000.eea.europa.eu/;
- Information on the status of EU protected habitats and species in Ireland, obtained from the NPWS Article 17 reports;
- Text summaries of the relevant European sites taken from the respective Site Synopses for each site, available at www.npws.ie;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at www.gis.epa.ie;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland; and
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and their design team.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 8, References.

2.4 Impact Prediction

Potential impacts on the relevant European site(s) identified during the AA Screening are based on information regarding their QIs and/or SCI species, and the attributes and targets relating to their SSCOs where available. These have been informed by the desk study and any field surveys carried out prior to the preparation of this report.

Impact prediction is based on the Source-Pathway-Receptor (S-P-R) model. The following describes the steps of the S-P-R approach taken in this NIS:

- Potential sources of effects were identified based on the Proposed Development description and details, including changes to potentially suitable ex-situ habitats at the

Site (i.e., habitats utilised by Species of Conservational Importance (SCI) bird species outside of their designated SPAs).

- Up-to-date GIS spatial datasets for water catchments as well as any information from relevant site investigations and/or field surveys were used to identify the QIs/ SCIs within the relevant European site(s) that have a notable S-P-R connection to the Proposed Development:
    - The catchment data were used to establish or discount potential hydrological connectivity between the Proposed Development and any QIs/SCIs.
    - Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any QIs/SCIs.
    - Air and land connectivity assessed based on Proposed Development details and proximity to QIs/SCIs.
    - Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Identification of potential impacts for those QIs/SCIs linked to the Proposed Development via notable S-P-R connections.

Where the preceding steps identified any potential for adverse impacts on any QIs/SCIs for the relevant European site(s), appropriate mitigation measures to eliminate the potential for significant adverse effects are identified in this report.

3 LIMITATIONS

No limitations were encountered in the preparation of this NIS.

4 NATURA IMPACT STATEMENT

4.1 Existing Environment

4.1.1 Geology, Hydrology and Hydrogeology

The site of the Proposed Development is within the *Barrow* catchment (Catchment ID: 14) and *Barrow_SC_110* sub-catchment (Sub-catchment ID: 14_5). The closest mapped watercourse to the Site is the Baunleath Stream (EU Code: IE_SE_14O020700, Segment Code: 14_1736), 45m southeast of the Site, which discharges to the Madlin River (EU Code: IE_SE_14O020700, Segment Code: 14_1131), also referred to as the Old Leighlin Stream, before entering the River Barrow (EU Code: IE_SE_14B012820). A drain and culvert was recorded as part of the Site walkover by Hydro-Environmental Services (HES) in March 2022, which discharges to a drainage ditch flowing east along a hedgerow just northeast of the Proposed Development Site and also enters the Baunleath Stream.

Both the Baunleath Stream and the Madlin River are currently *At Risk* of not meeting their Water Framework Directive (WFD) objectives and designated a *Moderate* ecological status during the most recent 2016-2021 survey period (EPA, 2024). The status of the Madlin River was designated as *Good* (Q-Value:4) by the EPA in 2023 (station code: RS14O020700) (EPA, 2024).

The Site is situated on the *Bagenalstown Lower* groundwater body, which is *Not at Risk* of not meeting its WFD objectives. The aquifer type within the site boundary is *Regionally Important Aquifer - Karstified (diffuse)* (Rkd). The groundwater rock units underlying the aquifer are classified as *Dinantian Pure Bedded Limestones* (GSI, 2024).

The level of vulnerability of the site to groundwater contamination via human activities ranges from *Rock at or near surface*, to *Extreme*, to *High* and then *Moderate* from west to east across the Site. As outlined in the Hydrology Chapter of the EIAR accompanying this application, the drilling and logging of 5 no. groundwater monitoring wells (BH1 – BH5) was undertaken within the Proposed Development Site in August 2022, which included the monitoring of groundwater levels (manual and automated) in these 5 no. groundwater monitoring wells over a period of 4 no. months from 17th August 2022 to 19th December 2022. Based on this site-specific data, groundwater vulnerability is likely to be lowest in the south and west of the Site where the subsoils are thickest (recorded as 12.3m and 15.7m in BH5 and BH1, respectively) and provide the greatest protection to the underlying bedrock aquifer. Meanwhile, groundwater vulnerability will be higher in the northeast of the Site, where bedrock is close to the surface (4.1m and 4.3m in BH3 and BH4, respectively).

The soil is classified as *Ballinamore* and the predominant subsoil is Shales and sandstones till (Namurian) (*TNSSs*), with small areas of Bedrock at Surface (*Rck*) along the west boundary and Limestone till (Carboniferous) (*TLs*) along the east boundary (EPA, 2024).

4.2 Summary of Relevant European sites

The following descriptions of the relevant habitats and species occurring within the European site(s) considered in this NIS have been extracted from the Standard Data Forms (EEA 2024), Site Synopses (NPWS, 2016) and any supporting documents available for the relevant site(s).

4.2.1 River Barrow and River Nore SAC [002162]

The following description of the Site is extracted from the Site Synopsis (NPWS, 2016) for the site:

"This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford.

Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains before passing through a band of Carboniferous shales and sandstones. The Nore, for a large part of its course, traverses limestone plains and then Old Red Sandstone for a short stretch below Thomastown. Before joining the Barrow it runs over intrusive rocks poor in silica. The upper reaches of the Barrow also run through limestone. The middle reaches and many of the eastern tributaries, sourced in the Blackstairs Mountains, run through Leinster Granite. The southern end, like the Nore runs over intrusive rocks poor in silica. Waterford Harbour is a deep valley excavated by glacial floodwaters when the sea level was lower than today. The coast shelves quite rapidly along much of the shore.

Good examples of alluvial forest (a priority habitat on Annex I of the E.U. Habitats Directive) are seen at Rathsnagadan, Murphy's of the River, in Abbeyleix estate and along other shorter stretches of both the tidal and freshwater elements of the site. Typical species seen include Almond Willow (Salix triandra), White Willow (S. alba), Rusty Willow (S. cinerea subsp. oleifolia), Crack Willow (S. fragilis) and Osier (S. viminalis), along with Iris (Iris pseudacorus), Hemlock Water-dropwort (Oenanthe crocata), Wild Angelica (Angelica sylvestris), Thin-spiked Wood-sedge (Carex strigosa), Pendulous Sedge (C. pendula), Meadowsweet (Filipendula ulmaria), Common Valerian (Valeriana officinalis) and the Red Data Book species Nettle-leaved Bellflower (Campanula trachelium).

A good example of petrifying springs with tufa formations occurs at Dysart Wood along the Nore. This is a rare habitat in Ireland and one listed with priority status on Annex I of the E.U. Habitats Directive. These hard water springs are characterised by lime encrustations, often associated with small waterfalls. A rich bryophyte flora is typical of the habitat and two diagnostic species, Palustriella commutata and Eucladium verticillatum, have been recorded.

The best examples of old oak woodlands are seen in the ancient Park Hill woodland in the estate at Abbeyleix; at Kyleadohir, on the Delour, Forest Wood House, Kylecorragh and Brownstown Woods on the Nore; and at Cloghristic Wood, Drummond Wood and Borris Demesne on the Barrow, though other patches occur throughout the site. Abbeyleix Woods is a large tract of mixed deciduous woodland which is one of the only remaining true ancient woodlands in Ireland. Historical records show that Park Hill has been continuously wooded since the 16th century and has the most complete written record of any woodland in the country. It supports a variety of woodland habitats and an exceptional diversity of species including 22 native trees, 44 bryophytes and 92 lichens. It also contains eight indicator species

of ancient woodlands. Park Hill is also the site of two rare plants, Nettle-leaved Bellflower and the moss Leucodon sciuroides. The rare Myxomycete fungus, Licea minima has been recorded from woodland at Abbeyleix.

Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. In the Barrow the species found include water-starworts (Callitriche spp.), Canadian Pondweed (Elodea canadensis), Bulbous Rush (Juncus bulbosus), water-milfoils (Myriophyllum spp.), the pondweed Potamogeton x nitens, Broad-leaved Pondweed (P. natans), Fennel Pondweed (P. pectinatus), Perfoliated Pondweed (P. perfoliatus) and crowfoots (Ranunculus spp.). The water quality of the Barrow has improved since the vegetation survey was carried out (EPA, 1996).

The site is very important for the presence of a number of E.U. Habitats Directive Annex II animal species including Freshwater Pearl Mussel (both Margaritifera margaritifera and M. m. durrovensis), White-clawed Crayfish, Salmon, Twaite Shad, three lamprey species – Sea Lamprey, Brook Lamprey and River Lamprey, the tiny whorl snail Vertigo moulinsiana and Otter. This is the only site in the world for the hard water form of the Freshwater Pearl Mussel, M. m. durrovensis, and one of only a handful of spawning grounds in the country for Twaite Shad. The freshwater stretches of the River Nore main channel is a designated salmonid river. The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning. The site supports many other important animal species. Those which are listed in the Irish Red Data Book include Daubenton's Bat, Badger, Irish Hare and Common Frog. The rare Red Data Book fish species Smelt (Osmerus eperlanus) occurs in estuarine stretches of the site. In addition to the Freshwater Pearl Mussel, the site also supports two other freshwater mussel species, Anodonta anatina and A. cygnea.

The site is of ornithological importance for a number of E.U. Birds Directive Annex I species, including Greenland White-fronted Goose, Whooper Swan, Bewick's Swan, Bar-tailed Godwit, Peregrine and Kingfisher. Nationally important numbers of Golden Plover and Bar-tailed Godwit are found during the winter. Wintering flocks of migratory birds are seen in Shanahoe Marsh and the Curragh and Goul Marsh, both in Co. Laois, and also along the Barrow Estuary in Waterford Harbour. There is also an extensive autumnal roosting site in the reedbeds of the Barrow Estuary used by Swallows before they leave the country. The old oak woodland at Abbeyleix has a typical bird fauna including Jay, Long-eared Owl and Raven. The reedbed at Woodstown supports populations of typical waterbirds including Mallard, Snipe, Sedge Warbler and Water Rail.

Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive. Furthermore it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows and the population of the hard water form of the Freshwater Pearl Mussel, which is limited to a 10 km stretch of the Nore, add further interest to this site."

4.2.2 Qualifying Interests and Conservation Objectives

The QIs/SCIs and their respective conservation objectives for the relevant European site are

detailed in Table 1.

TABLE 1. THE QIS FOR THE EUROPEAN SITES RELEVANT TO THIS NIS AND THEIR RESPECTIVE CONSERVATION OBJECTIVES.

Qualifying Interest	Conservation Objectives
River Barrow and River Nore SAC (002162)	
[1130] Estuaries	To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore SAC.
[1140] Mudflats and sandflats not covered by seawater at low tide	To maintain the favourable conservation condition of the Mudflats and sandflats not covered by seawater at low tide in the River Barrow and River Nore SAC.
[1170] Reefs	See conservation objective for [1130] Estuaries
[1310] *Salicornia* and other annuals colonizing mud and sand	To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the River Barrow and River Nore SAC.
[1330] Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)	To restore the favourable conservation condition of Atlantic salt meadows in the River Barrow and River Nore SAC.
[1410] Mediterranean Salt Meadows (*Juncetalia maritimi*)	To restore the favourable conservation condition of Mediterranean salt meadows in the River Barrow and River Nore SAC.
[3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation	To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation in the River Barrow and River Nore SAC.
[4030] European dry heaths	To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC.
[6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the River Barrow and River Nore SAC.
[7220] Petrifying springs with tufa formation (Cratoneurion)	To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) in the River Barrow and River Nore SAC.
[91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	To restore the favourable conservation condition of Old oak woodland with *Ilex* and *Blechnum* in the River Barrow and River Nore SAC.
[91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in the River Barrow and River Nore SAC.
[1016] *Vertigo moulinsiana* (Desmoulin's Whorl Snail)	To maintain the favourable conservation condition of Desmoulin's whorl snail in the River Barrow and River Nore SAC.
[1029] *Margaritifera margaritifera* (Freshwater Pearl Mussel)	The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species.
[1092] *Austropotamobius pallipes* (White-clawed Crayfish)	To maintain the favourable conservation condition of White-clawed crayfish in the River Barrow and River Nore SAC.
[1095] *Petromyzon marinus* (Sea Lamprey)	To restore the favourable conservation condition of Sea lamprey in the River Barrow and River Nore SAC.

Qualifying Interest	Conservation Objectives
[1096] *Lampetra planeri* (Brook Lamprey)	To restore the favourable conservation condition of Brook lamprey in the River Barrow and River Nore SAC.
[1099] *Lampetra fluviatilis* (River Lamprey)	To restore the favourable conservation condition of River lamprey in the River Barrow and River Nore SAC.
[1103] *Alosa fallax fallax* (Twaite Shad)	To restore the favourable conservation condition of Twaite shad in the River Barrow and River Nore SAC.
[1106] *Salmo salar* (Salmon)	To restore the favourable conservation condition of Salmon in the River Barrow and River Nore SAC.
[1355] *Lutra lutra* (Otter)	To restore the favourable conservation condition of Otter in the River Barrow and River Nore SAC.
[1421] *Trichomanes speciosum* (Killarney Fern)	To maintain the favourable conservation condition of Killarney Fern in the River Barrow and River Nore SAC.
[1990] *Margaritifera durrovensis* (Nore Pearl Mussel)	To restore the favourable conservation condition of the Nore freshwater pearl mussel in the River Barrow and River Nore SAC.

TABLE 2. THE CONSERVATION ATTRIBUTES AND TARGETS THAT DEFINE THE 'FAVOURABLE CONSERVATION CONDITION' REFERRED TO IN THE CONSERVATION OBJECTIVE FOR EACH QI FOR THE RIVER BARROW AND RIVER NORE SAC.

Site Name	Qualifying Interests	Attributes and Targets
Special Areas of Conservation (SAC)		
River Barrow and River Nore SAC (002162)	[1130] Estuaries	**Habitat Area -** The permanent habitat area is stable or increasing, subject to natural processes. **Community distribution -** The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex; Fine sand with *Fabulina fabula* community. **Community extent -** Maintain the natural extent of the *Sabellaria alveolata* reef, subject to natural process.
	[1140] Mudflats and sandflats not covered by seawater at low tide	**Habitat area -** The permanent habitat area is stable or increasing, subject to natural processes. **Community distribution -** The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex.
	[1310] *Salicornia* and other annuals colonizing mud and sand	**Habitat area -** Area stable or increasing, subject to natural processes, including erosion and succession. For the one sub- site mapped: Ringville - 0.03ha. **Habitat distribution -** No decline, subject to natural processes. **Physical structure: sediment supply -** Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions. **Physical structure: flooding regime -** Maintain natural tidal regime. **Physical structure: creeks and pans -** Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession. **Vegetation structure: zonation -** Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. **Vegetation structure: vegetation height -** Maintain structural variation within sward. **Vegetation structure: vegetation cover -** Maintain more than 90% of area outside creeks vegetated. **Vegetation composition: typical species and sub-communities -** Maintain range of sub-communities with typical species listed in SMP (McCorry and Ryle, 2009).

Site Name	Qualifying Interests	Attributes and Targets
		Vegetation structure: negative indicator species - *Spartina anglica* - No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur.
	[1330] Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)	**Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 1.25ha, Killowen - 2.59ha, Rochestown - 17.50ha, Ringville - 6.70ha. **Habitat distribution** - No decline, subject to natural processes. **Physical structure: sediment supply** - Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions. **Physical structure: flooding regime** - Maintain natural tidal regime. **Physical structure: creeks and pans** - Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession. **Vegetation structure: zonation** - Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. **Vegetation structure: vegetation height** - Maintain structural variation within sward. **Vegetation structure: vegetation cover** - Maintain more than 90% of area outside creeks vegetated. **Vegetation composition: typical species and subcommunities** - Maintain range of sub-communities with characteristic species listed in SMP (McCorry and Ryle, 2009). **Vegetation structure: negative indicator species - *Spartina anglica*** - No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur.
	[1410] Mediterranean Salt Meadows (*Juncetalia maritimi*)	**Habitat area** - Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 0.08ha, Rochestown - 0.04ha, Ringville - 6.70ha. **Habitat distribution** - No decline, subject to natural processes. **Physical structure: sediment supply** - Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions. **Physical structure: flooding regime** - Maintain natural tidal regime. **Physical structure: creeks and pans** - Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.

Site Name	Qualifying Interests	Attributes and Targets
		Vegetation structure: zonation - Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession. **Vegetation structure: vegetation height** - Maintain structural variation within sward. **Vegetation structure: vegetation cover** - Maintain more than 90% of area outside creeks vegetated. **Vegetation composition: typical species and subcommunities** - Maintain range of sub-communities with characteristic species listed in SMP (McCorry and Ryle, 2009). **Vegetation structure: negative indicator species - *Spartina anglica*** - No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur.
	[3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation	**Habitat distribution** - No decline, subject to natural processes. **Habitat area** - Area stable or increasing, subject to natural processes. **Hydrological regime: river flow** - Maintain appropriate hydrological regimes. **Hydrological regime: groundwater discharge** - The groundwater flow to the habitat should be permanent and sufficient to maintain tufa formation. **Substratum composition: particle size range** - The substratum should be dominated by large particles and free from fine sediments. **Water chemistry: minerals** - The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits. **Water quality: suspended sediment** - The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments. **Water quality: nutrients** - The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition. **Vegetation composition: typical species** - Typical species of the relevant habitat sub-type should be present and in good condition. **Floodplain connectivity** - The area of active floodplain at and upstream of the habitat should be maintained.
	[4030] European dry heaths	**Habitat distribution** - No decline from current habitat distribution, subject to natural processes.

Site Name	Qualifying Interests	Attributes and Targets
		Habitat area - Area stable or increasing, subject to natural processes. Habitat area is not known but estimated as less than 400ha of the area of the SAC, occurring in dispersed locations. **Physical structure: free-draining, acid, low nutrient soil; rock outcrops -** No significant change in soil nutrient status, subject to natural processes. No increase or decrease in area of natural rock outcrop. **Vegetation structure: sub-shrub indicator species -** Cover of characteristic sub- shrub indicator species at least 25%: gorse (*Ulex europaeus*) and where rocky outcrops occur bilberry (*Vaccinium myrtillus*) and woodrush (*Luzula sylvatica*). Some rock outcrops support English stonecrop (*Sedum anglicum*), sheep's bit (*Jasione montana*) and wild madder (*Rubia peregrina*) as well as important moss and lichen assemblages. **Vegetation structure: senescent gorse -** Cover of senescent gorse less than 50%. **Vegetation structure: browsing -** Long shoots of bilberry with signs of browsing collectively less than 33%. **Vegetation structure: native trees and shrubs -** Cover of scattered native trees and shrub less than 20%. **Vegetation composition: positive indicator species -** Number of positive indicator species at least 2 e.g. gorse and associated dry heath/ acid grassland flora. **Vegetation structure: positive indicator species -** Cover of positive indicator species at least 60%. This should include plant species characteristic of dry heath in this SAC including gorse, bilberry and associated acid grassland flora. **Vegetation composition: bryophyte and non-crustose lichen species -** Number of bryophyte or non- crustose lichen species present at least 2. **Vegetation composition: bracken (*Pteridium aquilinum*) -** Cover of bracken less than 10%. **Vegetation structure: weedy negative indicator species -** Cover of agricultural weed species (negative indicator species) less than 1%. **Vegetation composition: non-native species -** Cover of non-native species less than 1%. **Vegetation composition: rare/scarce heath species -** No decline in distribution or population sizes of rare, threatened or scarce species, including Greater Broomrape (*Orobanche rapum-genistae*) and the legally protected clustered clover (*Trifolium glomeratum*). **Vegetation structure: disturbed bare ground -** Cover of disturbed bare ground less than 10% (but if peat soil less than 5%). **Vegetation structure: burning -** No signs of burning within sensitive areas.

Site Name	Qualifying Interests	Attributes and Targets
	[6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	**Habitat distribution** - No decline, subject to natural processes. **Habitat area** - Area stable or increasing, subject to natural processes. **Hydrological regime: Flooding depth/height of water table** - Maintain appropriate hydrological regimes. **Vegetation structure: sward height** - 30-70% of sward is between 40 and 150cm in height. **Vegetation composition: broadleaf herb:grass ratio** - Broadleaf herb component of vegetation between 40 and 90%. **Vegetation composition: typical species** - At least 5 positive indicator species present. **Vegetation composition: negative indicator species** - Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (*Impatiens glandulifera*), monkeyflower (*Mimulus guttatus*), Japanese knotweed (*Reynoutria japonica*) and giant hogweed (*Heracleum mantegazzianum*).
	[7220] Petrifying springs with tufa formation (Cratoneurion)	**Habitat area** - Area stable or increasing, subject to natural processes. **Habitat distribution** - No decline. **Hydrological regime: height of water table; water flow** - Maintain appropriate hydrological regimes. **Water quality** - Maintain oligotrophic and calcareous conditions. **Vegetation composition: typical species** - Maintain typical species.
	[91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	**Habitat area** - Area stable or increasing, subject to natural processes, at least 85.08ha for sub-sites surveyed. **Habitat distribution** - No decline. **Woodland size** - Area stable of increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size. **Woodland structure: cover and height** - Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi- mature trees and shrubs; and well-developed herb layer. **Woodland structure: community diversity and extent** - Maintain diversity and extent of community types. **Woodland structure: natural regeneration** - Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.

Site Name	Qualifying Interests	Attributes and Targets
		Woodland structure: dead wood - At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter. **Woodland structure: veteran trees** - No decline. **Woodland structure: indicators of local distinctiveness** - No decline. **Vegetation composition: native tree cover** - No decline. Native tree cover not less than 95%. **Vegetation composition: typical species** - A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*). **Vegetation composition: negative indicator species** - Negative indicator species, particularly non-native invasive species, absent or under control.
	[91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	**Habitat area** - Area stable or increasing, subject to natural processes, at least 181.54ha for sites surveyed. **Habitat distribution** - No decline. **Woodland size** - Area stable of increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size. **Woodland structure: cover and height** - Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi- mature trees and shrubs; and well-developed herb layer. **Woodland structure: community diversity and extent** - Maintain diversity and extent of community types. **Woodland structure: natural regeneration** - Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy. **Hydrological regime: Flooding depth/height of water table** - Appropriate hydrological regime necessary for maintenance of alluvial vegetation. **Woodland structure: dead wood** - At least 30m³/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder). **Woodland structure: veteran trees** - No decline. **Woodland structure: indicators of local distinctiveness** - No decline. **Vegetation composition: native tree cover** - No decline. Native tree cover not less than 95%.

Site Name	Qualifying Interests	Attributes and Targets
		Vegetation composition: typical species - A variety of typical native species present, depending on woodland type, including ash (*Fraxinus excelsior*) alder (*Alnus glutinosa*), willows (*Salix spp*) and locally, oak (*Quercus robur*). **Vegetation composition: negative indicator species** - Negative indicator species, particularly non-native invasive species, absent or under control.
	[1016] *Vertigo moulinsiana* (Desmoulin's Whorl Snail)	**Distribution: occupied sites** - No decline. Two known sites: Borris Bridge, Co. Carlow S711503; Boston Bridge, Kilnaseer S338774, Co. Laois. **Population size: adults** - At least 5 adults snails in at least 50% of samples. **Population density** - Adult snails present in at least 60% of samples per site. **Area of occupancy** - Minimum of 1ha of suitable habitat per site. **Habitat quality: vegetation** - 90% of samples in habitat classes I and II as defined in Moorkens & Killeen (2011). **Habitat quality: soil moisture levels** - 90% of samples in moisture class 3-4 as defined in Moorkens & Killeen (2011).
	[1029] *Margaritifera margaritifera* (Freshwater Pearl Mussel)	The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species.
	[1092] *Austropotamobius pallipes* (White-clawed Crayfish)	**Distribution** - No reduction from baseline. **Population structure: recruitment** - Juveniles and/or females with eggs in at least 50% of positive samples. **Negative indicator species** - No alien crayfish species. **Disease** - No instances of disease. **Water quality** - At least Q3-4 at all sites sampled by EPA. **Habitat quality: heterogeneity** - No decline in heterogeneity or habitat quality.
	[1095] *Petromyzon marinus* (Sea Lamprey)	**Distribution: extent of anadromy** - Greater than 75% of main stem length of rivers accessible from estuary. **Population structure of juveniles** - At least three age/size groups present. **Juvenile density in fine sediment** - Juvenile density at least 1/m².

Site Name	Qualifying Interests	Attributes and Targets
		Extent and distribution of spawning habitat - No decline in extent and distribution of spawning beds. **Availability of juvenile habitat** - More than 50% of sample sites positive.
	[1096] *Lampetra planeri* (Brook Lamprey)	**Distribution** - Access to all watercourses down to first order streams. **Population structure of juveniles** - At least three age/size groups of brook/river lamprey present. **Juvenile density in fine sediment** - Mean catchment juvenile density of brook/river lamprey at least 2/m². **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds. **Availability of juvenile habitat** - More than 50% of sample sites positive.
	[1099] *Lampetra fluviatilis* (River Lamprey)	**Distribution: extent of anadromy** - Greater than 75% of main stem and major tributaries down to second order accessible from estuary. **Population structure of juveniles** - At least three age/size groups of river/brook lamprey present. **Juvenile density in fine sediment** - Mean catchment juvenile density of brook/river lamprey at least 2/m². **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning beds. **Availability of juvenile habitat** - More than 50% of sample sites positive.
	[1103] *Alosa fallax fallax* (Twaite Shad)	**Distribution: extent of anadromy** - Greater than 75% of main stem and major tributaries down to second order accessible from estuary. **Population structure: age classes** - More than one age class present. **Extent and distribution of spawning habitat** - No decline in extent and distribution of spawning habitats. **Water quality: oxygen levels** - No lower than 5mg/l. **Spawning habitat quality: Filamentous algae; macrophytes; sediment** - Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth.
	[1106] *Salmo salar* (Salmon)	**Distribution: extent of anadromy** - 100% of river channels down to second order accessible from estuary. **Adult spawning fish** - Conservation Limit (CL) for each system consistently exceeded.

Site Name	Qualifying Interests	Attributes and Targets
		Salmon fry abundance - Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling. **Out-migrating smolt abundance** - No significant decline. **Number and distribution of redds** - No decline in number and distribution of spawning redds due to anthropogenic causes. **Water quality** - At least Q4 at all sites sampled by EPA.
	[1355] *Lutra lutra* (Otter)	**Distribution** - No significant decline. **Extent of terrestrial habitat** - No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around ponds. **Extent of marine habitat** - No significant decline. Area mapped and calculated as 857.7ha. **Extent of freshwater (river) habitat** - No significant decline. Length mapped and calculated as 616.6km. **Extent of freshwater (lake) habitat** - No significant decline. Area mapped and calculated as 2.6ha. **Couching sites and holts** - No significant decline. **Fish biomass available** - No significant decline.
	[1421] *Trichomanes speciosum* (Killarney Fern)	**Distribution** - No decline. Three locations known, with three colonies of gametophyte and one sporophyte colony. **Population size** - Maintain at least three colonies of gametophyte, and at least one sporophyte colony of over 35 fronds. **Population structure: juvenile fronds** - At least one of the locations to have a population structure comprising sporophyte, unfurling fronds, 'juvenile' sporophyte and gametophyte generations. **Habitat extent** - No loss of suitable habitat, such as shaded rock crevices, caves or gullies in or near to, known colonies. No loss of woodland canopy at or near to known locations. **Hydrological conditions: visible water** - Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations. **Hydrological conditions: humidity** - No increase. Presence of desiccated sporophyte fronds or gametophyte mats indicates conditions are unsuitable. **Light levels: shading** - No changes due to anthropogenic impacts.

Site Name	Qualifying Interests	Attributes and Targets
		Invasive species - Absent or under control.
	[1990] *Margaritifera durrovensis* (Nore Pearl Mussel)	**Distribution** - Maintain at 15.5km. **Population size: adult mussels** - Restore to 5,000 adult mussels. **Population structure: recruitment** - Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length. **Population structure: adult mortality** - No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution. **Habitat extent** - Restore suitable habitat in length of river corresponding to distribution target (15.5km) and any additional stretches necessary for salmonid spawning. **Water quality: Macroinvertebrates and phytobenthos (diatoms)** - Restore water quality- macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93. **Substratum quality: Filamentous algae (macroalgae), macrophytes (rooted higher plants)** - Restore substratum quality- filamentous algae: absent or trace (<5%). **Substratum quality: sediment** - Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment. **Substratum quality: oxygen availability** - Restore to no more than 20% decline from water column to 5cm depth in substrate. **Hydrological regime: flow variability** - Restore appropriate hydrological regimes. **Host fish** - Maintain sufficient juvenile salmonids to host glochidial larvae.

4.3 Impact Prediction

This section follows the S-P-R method as outlined in section 2.4 to identify if and how any of the QIs/SCIs of the relevant European site are linked to the Proposed Development. Once the connections have been identified the potential impacts of the Proposed Development on the identified European sites in light of its QIs/SCIs are assessed.

For the purposes of objectivity and clarity, mitigation measures **are not considered in the impact prediction.** This includes all measures that will act limit or eliminate the potential for significant adverse impacts on the relevant European site.

4.3.1 Potential impacts of the Proposed Development on key Species and Habitats

The following elements of the Proposed Development were identified and assessed for their potential to cause likely significant effects on European sites.

Construction Phase

- Uncontrolled releases of silt, sediments and/or other pollutants to air due to earthworks;
- Surface water run-off containing silt, sediments and/or other pollutants into nearby waterbodies or surface water network;
- Surface water run-off containing silt, sediments and/or other pollutants into the local groundwater;
- Movement of soils;
- Increased noise, dust and/or vibrations as a result of construction activity;
- Increased dust and air emissions from construction traffic;
- Increased lighting in the vicinity as a result of construction activity; and
- Increased human presence and activity as a result of construction activity.

Operational Phase

- Surface water drainage from the Site of the Proposed Development;
- Foul water from the Proposed Development;
- Increased lighting at the Site and in the vicinity emitted from the Proposed Development; and
- Increased human presence and activity at the Site and in the vicinity as a result of the Proposed Development.

Table 3 below outlines the relevant QIs/SCIs, and assesses the potential significant effects of the Proposed Development on these. The assessment outlined below does not consider mitigation measures that will be implemented as part of the Proposed Development, but the nature of mitigation that will be required to eliminate the potential for significant adverse impacts is identified in the table, if any.

TABLE 3. POTENTIAL LINKAGES BETWEEN THE PROPOSED DEVELOPMENT AND THE QIS OF RIVER BARROW AND RIVER NORE SAC.

Qualifying Interest	Potential for Impact
[1130] Estuaries	This habitat is estimated to cover 3856Ha and the closest record to the Site (as the crow flies) is 36.7km southeast in New Ross, Co Wexford. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[1140] Mudflats and sandflats not covered by seawater at low tide	This habitat is estimated to cover 926Ha and the closest record to the Site (as the crow flies) is 37.6km southeast in New Ross, Co Wexford. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[1310] *Salicornia* and other annuals colonizing mud and sand	This habitat is estimated to cover 0.03Ha and the closest record to the Site (as the crow flies) is 46.3km south at the mapped Ringsville sub-site. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[1330] Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)	This habitat is estimated to cover 35.07Ha and the closest record to the Site (as the crow flies) is 41.6km south, however further unsurveyed areas may be present within the SAC. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[1410] Mediterranean Salt Meadows (*Juncetalia maritimi*)	This habitat is estimated to cover 6.82Ha and the closest record to the Site (as the crow flies) is 44.4km south, however further unsurveyed areas may be present within the SAC. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed

Qualifying Interest	Potential for Impact
	Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and Callitricho-Batrachion vegetation	The full distribution of this habitat and its sub-types within this SAC is currently unknown The basis of the selection of this habitat is the presence of an excellent example of the vegetation community (nutrient-rich type) associated with extensive tufa deposits on the river bed in the Kings tributary of the Nore, 22.7km southwest of the Site. There will be no direct loss of this habitat due to the Proposed Development. The recorded habitat is located within a separate catchment and there is a significant distance between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[4030] European dry heaths	The total habitat area is not known but estimated as less than 400Ha of the area of the SAC, occurring in dispersed locations. The extent of this habitat is unmapped within this SAC, however the closest recorded location outside any SAC is 23.2km south of the Site. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[6430] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	The full extent and distribution of this habitat is currently unknown, however the closest recorded location is 24.0km southeast of the Site. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[7220] Petrifying springs with tufa formation (Cratoneurion)	The full extent and distribution of this habitat is currently unknown, however the closest recorded location is 25.4km southwest of the Site, as it was recorded at Dysart, between Thomastown and Inistioge. There will be no direct loss of this habitat due to the Proposed Development. The recorded habitat is located within a separate catchment and there is a significant distance between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**

Qualifying Interest	Potential for Impact
[91A0] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	This habitat is estimated to cover 85.08Ha and the closest record to the Site (as the crow flies) is 20.8km southeast at Graiguenamanagh, Co. Kilkenny. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	This habitat is estimated to cover 85.08Ha and the closest record to the Site along the River Barrow (as the crow flies) is 15.9km southeast at Borris, Co. Carlow. There will be no direct loss of this habitat due to the Proposed Development. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this habitat within River Barrow and River Nore SAC. **No potential for significant effect.**
[1016] *Vertigo moulinsiana* (Desmoulin's Whorl Snail)	This species has been recorded at two locations within this SAC, namely Borris Bridge, Co. Carlow (15.9km southeast of the site) and Boston Bridge, Co. Laois, located within the River Nore catchment. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this species within River Barrow and River Nore SAC. **No potential for significant effect.**
[1029] *Margaritifera margaritifera* (Freshwater Pearl Mussel)	The status of the freshwater pearl mussel as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. However, this species has been found within the Aughavaud River, Ballymurphy River, and Mountain River downstream of the site, with the closest being Mountain River at Borris, Co. Carlow (15.9km southeast of the site). The lifecycle of this species also relies on the presence of salmonid hosts. Therefore, there is potential for contaminated surface water run-off/discharges from the Proposed Development to negatively impact this species via water quality deterioration and the resulting potential impact on salmonoid hosts. There is also potential, although unlikely as no significant karst features were recorded on Site during Site investigations, for pollutants to migrate through the karst aquifer and surface waterbodies to the Madlin River and River Barrow and negatively impact the water quality of these rivers. The potential for a reduction in water quality downstream of the Proposed Development during the Construction and Operational Phases will be addressed with appropriate mitigation measures. **Potential for significant effect.**

Qualifying Interest	Potential for Impact
[1092] *Austropotamobius pallipes* (White-clawed Crayfish)	There are records for this species within the Madlin River and River Barrow downstream of the site of the Proposed Development, the closest of which is 2.4km northeast of the Site, and as such there is a hydrological connection between this species and the Site during the Construction and Operational Phases of the Proposed Development. Therefore, there is potential for contaminated surface water run-off/discharges from the Proposed Development to negatively impact this species via water quality deterioration. There is also potential, although unlikely as no significant karst features were recorded on Site during Site investigations, for pollutants to migrate through the karst aquifer and surface waterbodies to the Madlin River and River Barrow and negatively impact the water quality of these rivers. The potential for a reduction in water quality downstream of the Proposed Development during the Construction and Operational Phases will be addressed with appropriate mitigation measures. **Potential for significant effect.**
[1095] *Petromyzon marinus* (Sea Lamprey)	There are records of this species within the main channel of the River Barrow, with the closest being at Borris, Co. Carlow (15.9km southeast of the site) (King, 2006). Therefore, there is potential for contaminated surface water run-off/discharges from the Proposed Development to negatively impact this species via water quality deterioration. There is also potential, although unlikely as no significant karst features were recorded on Site during Site investigations, for pollutants to migrate through the karst aquifer and surface waterbodies to the Madlin River and River Barrow and negatively impact the water quality of these rivers. The potential for a reduction in water quality downstream of the Proposed Development during the Construction and Operational Phases will be addressed with appropriate mitigation measures. **Potential for significant effect.**
[1096] *Lampetra planeri* (Brook Lamprey) [1099] *Lampetra fluviatilis* (River Lamprey)	*Lampetra* spp. have been recorded within the Madlin River (King, 2006) downstream of the site of the Proposed Development, 2.4km northeast of the Site, and as such there is a hydrological connection between this species and the site during the Construction and Operational Phases of the Proposed Development. Therefore, there is potential for contaminated surface water run-off/discharges from the Proposed Development to negatively impact this species via water quality deterioration. There is also potential, although unlikely as no significant karst features were recorded on Site during Site investigations, for pollutants to migrate through the karst aquifer and surface waterbodies to the Madlin River and River Barrow and negatively impact the water quality of these rivers. The potential for a reduction in water quality downstream of the Proposed Development during the Construction and Operational Phases will be addressed with appropriate mitigation measures. **Potential for significant effect.**

Qualifying Interest	Potential for Impact
[1103] *Alosa fallax fallax* (Twaite Shad)	This species is known to spawn within the gravel beds at St. Mullin's, Co. Carlow, 26.8km southeast of the site, and then spend the majority of their life within estuarine and coastal habitats. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the Site of the Proposed Development and the recorded locations of this species within River Barrow and River Nore SAC. **No potential for significant effect.**
[1106] *Salmo salar* (Salmon)	This species has been recorded throughout the main channel of the River Barrow, 2.8km northeast of the Site. Therefore, there is potential for contaminated surface water run-off/discharges from the Proposed Development to negatively impact this species via water quality deterioration. There is also potential, although unlikely as no significant karst features were recorded on Site during Site investigations, for pollutants to migrate through the karst aquifer and surface waterbodies to the Madlin River and River Barrow and negatively impact the water quality of these rivers. The potential for a reduction in water quality downstream of the Proposed Development during the Construction and Operational Phases will be addressed with appropriate mitigation measures. **Potential for significant effect.**
[1355] *Lutra lutra* (Otter)	This species has been recorded within and alongside the main channel of the River Barrow, 2.8km northeast of the Site. Therefore, there is potential for contaminated surface water run-off/discharges from the Proposed Development to negatively impact this species via water quality deterioration. There is also potential, although unlikely as no significant karst features were recorded on Site during Site investigations, for pollutants to migrate through the karst aquifer and surface waterbodies to the Madlin River and River Barrow and negatively impact the water quality of these rivers. The potential for a reduction in water quality downstream of the Proposed Development during the Construction and Operational Phases will be addressed with appropriate mitigation measures. **Potential for significant effect.**
[1421] *Trichomanes speciosum* (Killarney Fern)	The closest record of this species is 20.9km southeast of the site at Graiguenamanagh, Co. Kilkenny. There is a significant distance and riparian buffer between the location of any potential construction related surface water discharges at the site of the Proposed Development and the recorded locations of this species within River Barrow and River Nore SAC. **No potential for significant effect.**

Qualifying Interest	Potential for Impact
[1990] *Margaritifera durrovensis* (Nore Pearl Mussel)	This species is only recorded within the main channel of the River Nore, located within a separate catchment to the site of the Proposed Development. There is a significant distance no hydrological pathway between the location of any potential construction related surface water discharges at the site of the Proposed Development and the recorded locations of this species within River Barrow and River Nore SAC. **No potential for significant effect.**

4.3.2 Potential for In-combination Effects

4.3.2.1 Existing Planning Permissions

Any planning applications listed as granted or decision pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on the relevant European sites. Long-term developments granted outside of this time period were also considered where applicable.

There are several existing planning permissions on record in the area, approximately 1.5km surrounding the Site, ranging from small-scale extensions and alterations to existing residential properties to larger-scale developments. The larger developments/projects identified within 1km of the Proposed Development are listed in Table 4 below:

TABLE 4. EXISTING GRANTED PLANNING PERMISSIONS IN THE VICINITY OF THE PROPOSED DEVELOPMENT

Planning Application Number/Licence	Description
1764	Continuance of use of the existing permitted quarry site and existing ancillary facilities, regularised by the previous grant of substitute consent (PL01.SU0024); Lateral extension of the existing quarry void from the existing area of c.3.4 hectares(ha.)increasing to total extraction area of c.4.5 ha; Deepening of the existing quarry void from the existing floor level at c.42-45m AOD to a final floor depth of c.21m AOD; Buffer zone of c.20m between the eastern extraction boundary and the public road, with construction of an earthen screening berm (1.5m high) along the eastern extraction boundary; Relocation of the employee car parking spaces (39no.) ; demolition of the existing processing factory to allow for the lateral quarry extension ; Improvements to the existing dedicated HGV site entrance to meet the necessary site line requirements Provision of a wheelwash facility ; Installation of surface water attenuation and settlement ponds for the treatment of suspended solids in the floor of the quarry; Existing rate of rock extraction to remain at c.30000 cubic metres per year

Air and land pathways are considered to be limited to surrounding areas within approx. 200-300m from the Site boundary for any noise and dust sources, depending on prevailing weather

conditions. Additionally, light spill is considered to be limited to areas within the Site and habitats immediately adjacent to the boundaries.

Studies have found that "*95% of dust particles from mineral workings have a relatively high mass and generally deposit within 100m of the point of release, with the remainder being deposited within 200 – 500 m of source*" (IAQM, 2016). Due to the nature and localised scale of the works, emissions to air during Construction will be limited to dust generation within 100m of the Site (based on TII assessment criteria for major-sized construction sites), and emissions from construction machinery and vehicles (NRA, 2011). Given the activity of the Proposed Development Site, in-combination with the adjacent active quarry (Planning Ref. No. 1764), dust generation and deposition during the Construction Phase has the potential to degrade habitats within 100m of the Proposed Development Site (NRA, 2011).

As such, the distance of 1.1km was deemed sufficient to exclude any effects propagated via air / land pathways such as dust deposition of leaves and root systems of the vegetation of QI habitats associated with River Barrow and River Nore SAC (002162) during Construction and Operation of the Proposed Development, in-combination with any other plans or projects.

In addition, in compliance with Condition 6(c) of the continuance of use of the existing permitting quarry site (Planning Ref. No. 1764) adjacent to the Proposed Development as set out by Carlow County Council, "*the number of blasting(s) per annum shall not exceed 2/3*". Blasting on Site during the Operational Phase of the Proposed Development will be agreed with the Planning Authority prior to the commencement of the Proposed Development and will be carried out with notice to the adjacent quarry to co-ordinate blasting activities to minimise noise and dusts impacts to the surrounding environment. Along with the noise and vibration mitigation measures set out in the Construction and Environmental Management Plan (CEMP) and the Noise and Vibration Chapter of the EIAR accompanying this application, the potential for in-combination impacts to occur are not foreseen on any European site, including River Barrow and River Nore SAC (002162).

5 MITIGATION MEASURES

In the absence of pollution control/water attenuation measures, groundwater and surface water run-off/discharges from the Proposed Development may have the potential to impact the water quality of the Madlin River and River Barrow and the aquatic species within these watercourses and the River Barrow and River Nore SAC (002162) during the Construction and Operational Phases of the Proposed Development. The below mitigation measures are recommended to offset this impact.

5.1 Construction Phase

5.1.1 Surface and Groundwater Contamination from Oil/Fuel Spills and Leaks

The following mitigation by design is proposed:

- All plant and machinery will be serviced before being mobilised to site;
- Refuelling will be completed in a controlled manner using drip trays (bunded container trays) at all times;
- Only designated trained operators will be authorised to refuel plant on site; and,

- Clear procedures and accompanying contingency plans will be in place for emergency accidents or spills by a specially trained and dedicated Environmental and Emergency Spill Response team on site and trained before works commence. As set out in the Construction Environmental Management Plan, the emergency response actions required, in the event of a spillage, the following procedure will be followed:
    - If safe (using PPE), stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
    - If safe (using PPE), contain the spill using the absorbent spills material provided. Do not spread or flush away the spill.
    - Cover or bund off any vulnerable areas where appropriate.
    - If possible, clean up as much as possible using the absorbent spills materials.
    - Do not hose the spillage down or use any detergents.
    - Contain any used absorbent material so that further contamination is limited.
    - Notify the Environmental Officer so that used absorbent material can be disposed of using a licensed waste contractor.
    - An accident investigation should be performed in accordance with procedures and the report sent to the Environmental Officer.
    - In the event of spillages or other incidents steps will be taken to prevent environmental pollution, for example through protection of drains by use of drain covers or booms, use of absorbent granules following an oil / chemical spill and turning off equipment or other sources of noise or dust.
    - Once the situation has been rectified, full details about the incident and remedial actions undertaken will be provided to the local authority and all other relevant authorities and recorded in the site environmental register. This site environmental register will be a register of regulatory, legal and other requirements, and this will be developed to summarise the environmental legislation, (as well as other requirements) that the project must adhere to. This legislation will be available through the construction manager's office on site. This register will be a controlled document, and as such will be reviewed and updated on a minimum six-monthly basis.

The temporary sumps will be located on the quarry floor. At the Proposed Development Site, the local geology dips gently to the west at ~20°. The proposed water management system will utilise the natural slope of the bedding planes, whereby surface water on the quarry floor will naturally flow to the west. Temporary sumps will be located in the west of the quarry void and at local low points on the quarry floor. As quarrying progresses, these sumps will be moved dependent on the nature of the bedrock encountered.

There will be no requirement for the temporary sumps to be clay lined due to the nature of the limestone bedrock (competent and strong limestones with no karstification), and the proposed pumping process. The proposed extraction will operate below the local groundwater. Groundwater monitoring in 5 no. boreholes at the proposed development site from August 2022 to May 2023 revealed groundwater levels ranging from 73.52mOD to 86.06mOD (metres above Ordnance Datum)[1]. This will result in groundwater flows being directed into the quarry void i.e. there will be no loss of water from the quarry to the surrounding bedrock (water will be pumped out of the void). As stated in the EIAR, groundwater inflows will be minor due to

[1] Source: Response to a Further Information Request, Hydro Environmental Services, September 2023.

the local hydrogeological regime. Consequently, there will be no loss of water from the sump to the underlying bedrock. With respect to groundwater flows, the temporary sumps will act as a sink (for onward pumping) rather than a source of recharge.

5.1.2 Earthworks Resulting in Suspended Solids Entrainment in Surface Waters

Prior to the commencement of earthworks, silt fencing will be placed downgradient of the construction areas where surface water may drain towards the Baunleath Stream and/or other small drainage ditches present within or adjacent the site. These silt fences will be embedded into the local soils to ensure all site water is captured and filtered.

Daily monitoring and inspections of run-off during the Construction Phase will be completed and should be detailed in the CEMP. Earthworks for the Construction Phase will take place during periods of low rainfall to reduce run-off and potential siltation of downstream watercourses.

The proposed water management system will direct surface water and any minor groundwater inflows in the site towards suitably designed settlement lagoons on the quarry floor. These lagoons will serve to attenuate discharge from the site and will ensure that discharge rates to the Baunleath Stream do not exceed the existing greenfield run-off rates or the maximum permitted daily discharge volume as per the discharge license. Water from the wheel wash will be recycled and will not enter the settlement ponds or be discharge to the Baunleath Stream.

5.1.3 Potential Effects on Surface and Groundwater WFD Status

Due to the hydrogeological regime at the proposed extraction area, characterised by high rates of groundwater recharge and low rates surface water run-off, the underlying ground waterbodies, which intersect with the River Barrow and River Nore SAC, are the most sensitive receptors. Surface watercourses will be less susceptible to effects during the Construction Phase due to the lack of surface water pathways between the extraction area and downstream surface waterbodies.

Strict mitigation measures in relation to the use of oils and fuels on-site will be implemented during the Construction Phase and will ensure the ongoing protection of groundwater and surface water quality. Fuel, oils, and chemicals used during construction are classified as hazardous.

Measures will include: any diesel, fuel or hydraulic oils stored onsite will be stored in bunded storage tanks in a dedicated impermeable area a least 30m from watercourses. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005) and will be properly secured against unauthorised access or vandalism. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

The appointed Contractor for the Construction Phase of the Proposed Development will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development Site. Only emergency breakdown maintenance will be carried out on-site. Drip trays and spill kits will be available on-site to ensure that any spills from vehicles are contained and removed off-site.

Storage of fuel hazardous will be undertaken with a view to protecting any essential services (electricity, water) and the receiving water environment. Bulk quantities of fuel will not be stored at the Proposed Development Site and fuel required for plant and equipment will be delivered directly from a delivery tanker. Fuel will only be stored in the quantities required for emergency use. Oils and chemicals used and stored on-site will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.

All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

- Bunds will comply with the requirements of Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
- 110% of the capacity of the largest tank or drum within the bunded area;
- 25% of the total volume of substance that could be stored within the bunded area;
- Vehicle or equipment maintenance work will take place in a designated impermeable area within the Site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines;
- Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages;
- All staff on-site will be fully trained on the use of equipment to be used on-site; and

There may also be the requirement for use of portable generators or similar fuel containing equipment during the Construction Phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.

Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works on Site.

A procedure will be prepared by the appointed contractor which will be adhered to during refuelling of on-site vehicles and plant. This will include the following:

- Fuel will be delivered to plant on-site by dedicated tanker or in a delivery bowser dedicated to that purpose
- In the case of a bowser, the driver or supervising foreman will check the delivery bowser daily for leakage
- The driver will be issued with, and will carry at all times, absorbent sheets, and granules to collect any spillages that may accidentally occur
- All deliveries to on-site vehicles will be supervised and records will be kept and retained onsite of delivery dates and volumes
- Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used, and
- All re-fuelling will take place in a designated impermeable area to be specified by the contractor. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.

Waste oils and hydraulic fluids will be collected in bunded containers and removed from the Proposed Development for disposal or recycling.

There will be no change in the WFD status in the underlying ground waterbodies or downstream surface waterbodies resulting from the Proposed Development. There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying ground waterbodies are protected from any potential deterioration from chemical pollution.

As such, the Proposed Development is compliant with the requirements of the Water Framework Directive (2000/60/EC).

5.2 Operational Phase

5.2.1 Increased Surface Water Discharge Volumes

The Proposed Development includes the provision of a water management system which will include the installation of surface water attenuation and settlement ponds on the quarry floor.

The proposed water management system will direct surface water and any minor groundwater inflows in the Site towards suitably designed settlement lagoons on the quarry floor. These lagoons will serve to attenuate discharge from the Site and will ensure that discharge rates to the Baunleath Stream do not exceed the existing greenfield run-off rates or the maximum permitted daily discharge volume as per the discharge licence. The discharge rate is estimated to be ~76m^3/day.

The proposed infrastructure will attenuate storm water so that any increase in discharge volumes during storm events are gradual and controlled, preventing an increase in the flood risk downstream of the site.

During the Operational Phase of the Proposed Development, there will be no discharge of untreated water to local surface watercourses and/or existing drainage ditches. The water management system, as outlined below in Figure 11, will provide water treatment in the form of attenuation, settlement of suspended solids and the removal of hydrocarbons prior to release by gravity to a nearby roadside drain which in turn discharges to the Baunleath Stream. The water management system is as follows:

- A series of land drains shall be constructed downgradient of the soil storage areas. These drains will be directed into the quarry void and arising water will be managed via the quarry water management system.
- Within the quarry void surface water (including rainfall falling within quarry area) and groundwater (minor groundwater inflows) will be collected in temporary sumps on the quarry floor. These temporary sumps will provide a degree of attenuation and settlement of fines.
- Water will be pumped from the sumps to the main settlement pond / water storage area. This settlement pond will provide additional attenuation and settlement of fines.
- All water from the quarry will be passed through a suitably sized hydrocarbon interceptor.
- The discharge rate (flow volume) from the site will be controlled using a hydrobrake.

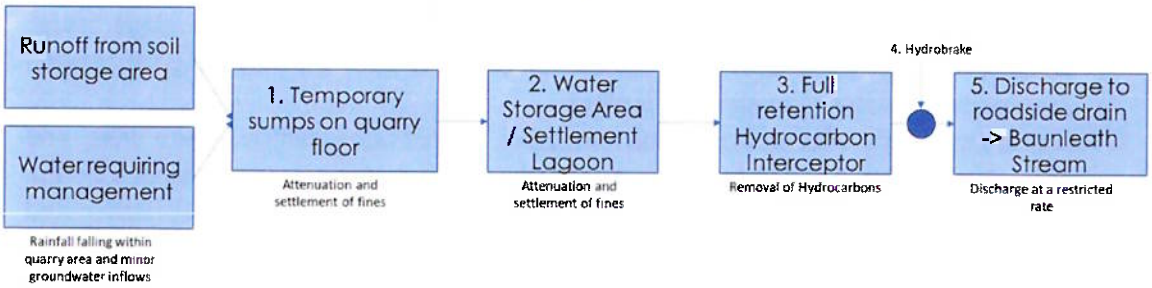

FIGURE 11. PROCESS FLOW DIAGRAM – PROPOSED WATER MANAGEMENT (HYDROENVIRONMENTAL SERVICES RFI RESPONSE 2023)

5.2.2 Potential Impacts on Surface Water Quality

The Proposed Development will utilise a water management system designed to prevent contamination of local surface waters with elevation concentrations of suspended solids or hydrocarbons.

Water from the wheel wash will be recycled and will not enter the settlement ponds or be discharge to the Baunleath Stream.

In addition, the following measures will be implemented to ensure that surface waters are not contaminated with hydrocarbons:

- Hydrocarbons at the Site will be delivered via fuel truck. There will be no storage of hydrocarbons on Site.
- Major repairs will be completed off site. Emergency mechanical repairs will use spill kits kept on-site.
- All water from the site will be passed through a hydrocarbon interceptor prior to discharge to the receiving watercourse.

Soakaways are proposed at several locations within the Site:

- The southern half of the hardcore set-down area will drain via bounding collector French drains (i.e. drains filled with drainage stone). Any excess water from these French drains will enter a soakaway and will be discharged to ground. The soakaway will be protected from suspended sediment as the granular material and geotextile fabric in the French drains will filter the water before any excess water enters the soakaway.
- Drainage from the main Site access road and the Site entrance will also be collected in filter drains prior to being discharged to ground via a soakaway. The drain will improve water quality through filtration, ensuring silt does not enter the soakaway. Furthermore, the water will flow through a hydrocarbon interceptor prior to entering the soakaway.

The French drains will be cleaned and maintained to ensure functionality.

A pump sump will transfer excess water to the quarry floor should any of the soakaway fail or become overloaded.

5.2.3 *Potential Impacts on Groundwater Quality*

All quarrying activities at the site will operate within a site-specific protocol for extraction which will follow the current international best practice.

Mitigation measures to protect groundwater quality will be implemented throughout the Operational Phase. The primary risks to groundwater quality result from hydrocarbon spills and leaks. The following mitigation measures will be implemented at the site.

- No refuelling or maintenance of construction/operation vehicles or plant will take place within the extraction area;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Refuelling will only occur at the designated fuel pad area, which will include an oil/fuel interceptor, from a mobile double skinned fuel bowser or equivalent;
- A spill kit will be kept beside the designated fuel pad area. The spill kit will contain fuel absorbent material, pads/mats and oil boom for use in the event of any accidental spill;
- Drip trays and fuel absorbent mats will be used during all refuelling operations;
- Onsite refuelling will be carried out by trained and competent personnel only;
- All plant and machinery will be serviced before been mobilized to site and regular leak inspections and fitness for purpose will be completed during the backfilling works;
- No substantial plant maintenance will be completed on site, any broken down plant will be removed from site to be fixed; and,
- The Site will operate under a dedicated Environmental Management System.

A wastewater holding tank will be installed to collect wastewater from onsite welfare facilities. The wastewater holding tank will be fitted with a high-level alarm. This alarm will indicate that the fluid in the tank has reached a certain level via a bright flashing LED and a loud buzzer. This will allow the tank to be emptied in a timely manner, ensuring that no overflow of wastewater occurs.

It is proposed to empty the holding tank by a licenced contractor once a month. Calculations for sizing of the holding tank are provided below in Table 6. No wastewater will be discharged on-site (to ground or to surface water) during the Construction or Operational Phases.

TABLE 5. DOMESTIC WASTEWATER ESTIMATES

No. staff on Site	**5**	No.
Volume of effluent per month	6200	Litres
Volume per month + 25%	7750	Litres
Proposed Holding Tank Volume	11,360	Litres

** As per Table 3 of EPA, 1999. (EPA, 1999)*[2]

[2] Wastewater Treatment Manuals – Treatment Systems for Small Communities, Business, Leisure Centres, and Hotels (P.E. 10-500) (EPA, 1999)

There are several wastewater treatment facilities in Co. Carlow that have the capacity to receive and treat the small volume of wastewater that will be generated. Nearby wastewater treatment facilities include Leighlinbridge Wastewater Treatment Plant (WwTP), Bagenalstown WwTP, Nurney WwTP and Mortarstown WwTP.

5.2.4 Groundwater Drawdown Associated with Dewatering

The proposed extraction will only extend to 46.5mOD (metres above Ordnance Datum), thereby limiting the extent of any potential local groundwater drawdown. The discharge rate from the proposed quarry is estimated to be ~76m^3/day.

Groundwater monitoring has revealed that the quarrying activities immediately to the north of the site have not resulted in any impact on local groundwater wells (SLR, 2017). Therefore, given the absence of karst features and flow conduits in the bedrock aquifer beneath the Site, groundwater inflow into the proposed quarry will be minimal.

Hence, the Proposed Development will not have a significant impact on local groundwater levels. No specific mitigation measures are required however groundwater monitoring in installed monitoring wells will be completed as part of the Proposed Development.

6 MONITORING

6.1 Construction Phase

Surface water quality monitoring will be completed during the Construction Phase of the Proposed Development.

Surface water quality monitoring will be completed monthly at discharge points (downstream of settlement ponds). The monitoring will include the following analytes:

- Visual Inspection
- Temperature
- pH
- Flow
- Biochemical Oxygen Demand (BOD)
- Suspended Solids
- Ammonia (as N)
- Orthophosphate
- Dissolved metals (Cd, Cu, Fe, Pb, Mg, Mn, Ni & Zn)
- Diesel Range Organics
- Petrol Range Organics

6.2 Operational Phase

Surface water quality monitoring as outlined above will also be completed during the Operational Phase of the Proposed Development.

Groundwater quality should also be completed on a biannual basis and shall include testing for the following parameters:

- pH

- BOD
- Ammonia (as N)
- Nitrate
- Total Nitrogen (as N)
- Orthophosphate (as P)
- Total Dissolved Solids
- Dissolved Metals (Cd, Cu, Fe, Pb, Mg, Mn, Ni & Zn)
- Total Petroleum Hydrocarbons
- Diesel Range Organics
- Petrol Range Organics
- Total Coliforms
- Faecal Coliforms

Groundwater level monitoring is also recommended throughout the Operational Phase of the Proposed Development. Groundwater level monitoring will be completed in the on-site monitoring wells (BH1, BH2 and BH5).

6.3 Reporting

All monitoring data throughout the Construction and Operational Phases will be made available to Carlow County Council on a quarterly basis, or as specified within any planning condition or condition of the Discharge Licence.

Table 6 below provides a summary of the proposed monitoring.

TABLE 6. SUMMARY OF PROPOSED MONITORING PLAN

Monitoring Element	Monitoring Location	Phase of Development	Frequency	Completed By
Surface Water Quality	Downstream of settlement ponds	Construction	Monthly	Milford Quarries Ltd Env. Manager / Appointed Env. Service Provider
Surface Water Quality	Discharge location	Operational	Monthly	Milford Quarries Ltd Env. Manager / Appointed Env. Service Provider
Groundwater Quality	On-site boreholes (BH1, BH2 and BH5)	Operational	Biannual	Milford Quarries Ltd Env. Manager / Appointed Env. Service Provider
Groundwater Levels	On-site boreholes (BH1, BH2 and BH5)	Operational	Quarterly dipping of boreholes Continuous monitoring in 2	Milford Quarries Ltd Env. Manager / Appointed Env. Service Provider

			no. boreholes (dataloggers)	

7 CONCLUSION

This NIS details the findings of the Stage 2 AA conducted to further examine the potential direct and indirect impacts of the Proposed Development at Bannagagole, Old Leighlin, Co. Carlow on the following European site:

- River Barrow and River Nore SAC (002162).

The above site was identified by a screening exercise that assessed likely significant effects of a range of effects that may arise from the Proposed Development. The AA investigated the potential direct and indirect impacts of the Proposed Works, both during Construction and Operation Phases on the integrity and QIs of the above European site alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives.

Where potentially significant impacts were identified, a range of mitigation and avoidance measures have been suggested to offset them. As a result of this AA, it has been concluded that, ensuring the avoidance and mitigation measures are implemented as proposed, the Proposed Development will not have a significant adverse impact on the above European site.

As a result of the complete, precise, and definitive findings of this NIS, it has been concluded, beyond reasonable scientific doubt, that the Proposed Development will have no adverse effects on the QIs, SCIs and on the integrity and extent of River Barrow and River Barrow and River Nore SAC. Accordingly, the Proposed Development will not adversely affect the integrity of any relevant European site.

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