DAVIN PLANT HIRE LTD

Planning application

Boycetown Land Reclamation, Dunsany, Co. Meath
Environmental Impact Assessment Report (EIAR)

October 2021

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

PROJECT: **Planning application**
Boycetown Land Reclamation

CLIENT: Davin Plant Hire Ltd

COMPANY: **Ray Gilmartin – Agricultural Consultant**

TABLE OF CONTENTS

Index of Figures

Appendices

1 INTRODUCTION

1.1 INTRODUCTION

Davin Plant Hire Ltd. intends to apply to Meath County Council for planning permission for the importation of inert excavation spoil comprising natural materials of clay, silt, sand, gravel or stone for the purposes of land reclamation. This material will be sourced from local construction projects in proximity of the site. The activity area comprises of 5.1 ha, which also accounts for the access track to the restoration area.

The proposed development will significantly improve grassland performance at the site, advantages including:

- Better access to land via access track;
- Fewer wet areas to avoid;
- Improved crop yield and quality;
- Improved plant performance;
- Reduced duration/ risk of autumn waterlogging;
- More rapid warming of soils in spring, improving germination;
- Better access to water and oxygen for plant roots;
- Better crop uptake of soil mineral nitrogen and reduction in phosphate runoff;
- Quicker accessibility of fields following any period of wet weather;
- Crop inputs more likely to be applied at optimum time;
- An extended growing and grazing season;
- Improved trafficking speed of work and fuel use; and
- Better traction

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of Davin Plant Hire Ltd to accompany a Planning application to Meath County Council.

1.2 SITE LOCATION AND BACKGROUND

Boycetown Land Reclamation is located in a primarily agricultural area within the townland of Boycetown, Dunsany, County Meath approximately 1 km west of the village of Kiltale, County Meath. The entrance to the site is located on the eastern boundary of the site, on the local road – L6202-3.

The River Boycetown flows to the east of the land reclamation area. The location of the site in relation to its geographic surrounds is shown on Figure 1.1 ‘Regional Site Location Map’.

The application site is land reclamation owned by Davin Plant Hire Ltd. The area proposed for land reclamation and landscaping in this application is approximately 5.6 ha.

A qualified agricultural specialist and a qualified and experienced senior ecologist designed the proposed land reclamation.

Indirect employment is generated in terms of contract transport operators, suppliers of products and services, machinery suppliers and environmental monitoring etc.

The application area of the Planning application area is approximately 5.6 hectares (ha), including the access track and the area at which the land reclamation works will be undertaken.

An Environmental Impact Assessment (EIA) is the process that examines the potential environmental effects of a proposed development. Where potential significant effects are identified, appropriate measures for the prevention and/or mitigation of impacts are prescribed. The EIA process consists of the preparation of an EIAR, the carrying out of consultations, the examination by the competent authority of the information presented in the EIAR and any supplementary information provided, followed by the reasoned conclusion by the competent authority on the significant effects of the project on the environment arising from the examination of the information presented. The EIAR is a statement of the effects, if any, that the proposed development would have on the environment and is used to inform the EIA process. This EIAR has been prepared by Raymond Gilmartin (principal consultant/agricultural consultant) on behalf of Davin Plant Hire Ltd. The proposed development is in accordance with planning guidance set out under Planning Policy and Development context, discussed further in Chapter 2 of this EIAR.

The National Spatial Strategy 2002-2020 (NSS) was published in November 2002 as a twenty-year coherent national planning framework for Ireland. The stated aims of the NSS were to achieve a better balance of social, economic and physical development across Ireland. In order to drive development in the regions, the NSS envisages that areas of sufficient scale and critical mass will be built up through a network of gateways and hubs. While the National Development Plan 2000-2006 identified Dublin, Cork, Limerick/Shannon, Galway and Waterford as existing gateways, the NSS designated four new national level gateways and nine strategically located, medium-sized hubs which will support and be supported by the gateways and will link out to wider rural areas. The aims of the NSS were integrated into the National Development Plan 2007 – 2013. Dublin as the capital city plays a vital national role.

However, it requires effective strategic planning and better management of the strong pressures within it to secure and consolidate that role for the future. Dublin and the Mid-east Regions (the Greater Dublin Area) are considered jointly because of their strong interrelationship. It is essential to the NSS that the performance of the economy of the Greater Dublin Area (GDA) and surrounding counties is built upon so that its success, competitiveness, and national role are sustained into the future. This means physically consolidating the growth of the metropolitan are i.e. Dublin City and suburbs. At the same time, development in the hinterland of the metropolitan area is to be concentrated in strategically places, strong and dynamic urban centre i.e. the 'Primary Development Centres'. These development centres have a unique role in Irish terms, given the scale of the Dublin City Region and the need for internal balance between the city and its surrounding counties.

Trim, along with the other County Towns (pop> 5,000) such as Navan, Balbriggan, Naas/Newbridge/Kilcullen and Wicklow comprise the Primary Development Centres. In the context of the NSS, however the future roles of Primary Development Centres such as these must take account of wider considerations, in addition to their relationship to Dublin. Issues that arise in this regard include the question of how such centres can energise their own catchments and relationships with areas in the neighbouring regions of the Border, Midlands and South East.

The Primary Development Centres need to aim at a population level that supports self-sustaining growth, but which does not undermine the promotion of critical mass in other regions. This suggests an ultimate population horizon of up to 40,000 people for the primary development centres.

The *Ireland 2040 Our Plan – National Planning Framework* was published in 2018. The NPF was developed to succeed the National Spatial Strategy. It provides a framework for national planning, pulling together relevant Government policies and investment on national and regional
development. It will have a focus on economic development and investment in housing, water services, transport, communications, energy, health and education infrastructure.

The *Regional Planning Guidelines for the Greater Dublin Area 2010-2022* (GDA RPGs) were adopted in June 2010 which aims to direct the future growth of the counties Dublin City, South Dublin, Fingal, Dún Laoghaire-Rathdown, Meath and Wicklow over the medium to long term and works to implement the strategic planning framework set out in the National Spatial Strategy (NSS) published in 2002.

The Settlement Strategy guides the future direction of growth and investment by setting and defining the settlement hierarchy and the identification of key growth areas within the GDA. This settlement strategy for the RPG's is focused on achieving the following key principles. Achieving the potential of the GDA as an international Gateway Consolidated and sustainable cities and towns
Supporting high quality public transport, and increase opportunities for walking and cycling It consists of four spatial policy concepts: 1. Continuation of the settlement policy of the GDA divided into the metropolitan and hinterland areas and the setting out of a settlement hierarchy which designates the key growth towns and districts to be consolidated, developed and supported within a sustainable form.

2. Focusing of new housing within the existing built up footprint of Dublin City and suburbs within the metropolitan area of Dublin, and that large scale 74 expansion of this footprint only occurring as part of an integrated plan where there are strong linkages between the lands in question and existing or planned high quality public transport creating opportunity and suitability to expand the built up area.

Strategic Housing Developments (SHD) are applications that go directly to An Bord Pleanála for decision. These decisions cannot be appealed. Some of the types of application under strategic housing developments include 100 or more houses. There have been over 25 applications for SHD to An Bord Pleanala since the introduction of the SHD process. This further highlights the demands for soil deposition sites in the region.

Figure 1-1: Site Location Map

Figure 1-2: Site Area – Aerial Map (www.googe.ie/maps)

To protect the environment and community, Davin Plant Hire Ltd. And the landowner will comply fully with national and international environmental standards. The proposed site will serve the local construction industry and contribution towards building Ireland's infrastructure.

1.3 ENVIRONMENTAL POLICY

The key objectives are to comply with applicable environmental legislation and best industry practice; To be a good neighbour; and To achieve continuous improvement in environmental performance.

General Note
As stated in its Environmental Policy, when addressing environmental issues Davin Plant Hire Ltd. adheres to the principle of Best Practice.

Good Housekeeping
Plant and buildings are kept in a good state of repair. Plant and buildings are kept painted and, in this respect, suitable colours have been chosen to minimise visual intrusion.

Davin Plant Hire Ltd. uses, as standard, good practice methods and ensures that soundproofing for plant and machinery are examined and maintained. Inspections relate specifically *to* protective measures where relevant, which have been incorporated to ameliorate dust, noise and visual impact.

Davin Plant Hire Ltd. recognises the planning permission procedure as an important regulatory requirement. A copy of relevant planning permissions along with licenses and safety procedures are available at the site office, for reference by operatives and contractors operating on the site.

Community Relations
Davin Plant Hire Ltd. aims at all times to be a good neighbour and play its part in the community. Davin Plant Hire Ltd. has a formal procedure for recording and dealing with complaints from the public.

1.4 CONSULTATION AND SCOPING

In accordance with Section 4 of the Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003) and the 2017 EIAR guidelines, the landowner undertook a process of consultation with Meath County Council. The primary objective of involving the competent body in the EIAR process was to aid scoping of the EIAR to allow all parties to highlight issues of concern prior to completion of the application. A consultation meeting took place with Meath County Council on March 10th, 2020.

See below a list of the various statutory bodies and interested parties consulted for the EIAR. All comments and observations relating to the site have been taken into consideration in the preparation of this EIAR.

- Meath County Council (planning and traffic section);
- NPWS, Development Applications Unit;
- National Roads Authority (TII);
- Inland Fisheries Ireland;
- Teagasc; and
- Environmental Protection Agency.

1.5 PROCEDURE AND STRUCTURE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

This EIAR has been prepared in accordance with requirements of the Planning and Development Act 2000 and the Planning and Development Regulations 2001 (as amended). Consideration has also been given to the requirements outlined in the Directive 2014/52/EU on the effects of certain public and private projects on the environment, which provides amendments to the previous Directive 2011/92/EU.

Subsequently consideration has been given to the circular letter issued by the Department of Housing, Planning, Community and Local Government (Ref No. PL 1/2017) on the 15th May outlining the requirements of the amended Directive as discussed above in section 1.6.

The consequences of any major project are generally presented in the form of an Environmental Impact Assessment Report (EIAR). This EIAR contains information on the scale and nature of the development at the application area, a description of the receiving environment, potential effects that may arise as a result of the development and an assessment of the impact and mitigation measures that may be required to protect the receiving environment.

The structure and content of the EIAR has been based on the following documents, as published by the Environmental Protection Agency:

- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (2003);
- Guidelines on the information to be contained in Environmental Impact Statements (2002);
- Draft Guidelines on the information to be contained in Environmental Impact Statements (2017) and
- Guidelines from the new EIA Directive 2014/52/EU.

This EIA provides for:

- A description of the site and the receiving environment;
- A description of the development;
- The impacts, if any, that may result from the proposed development;

- An assessment of any potential effects and the mitigation measures;

The overall EIA is arranged in three volumes, as follows:

- Volume I: Non-Technical Summary;
- Volume II: Main Environmental Impact Assessment Report; and
- Volume III: Appendices.

Volume I: Non-Technical Summary

This document provides an overview and summary of the main EIAR using non-technical terminology. It is a means for non-professionals to review the information included in the main EIA document. It is a stand-alone document and should offer a concise summary of the receiving environment, characteristics of the development and any impact that the development may have had on the receiving environment.

Volume II: Environmental Impact Assessment Report

To allow for ease of presentation and consistency when considering the various elements of the environment, a systematic structure will be adopted for the main body EIAR. This structure is known as a 'Grouped Format'. The structure is used for each particular environmental aspect, as provided below.

Chapter 1 – Introduction: this chapter of the EIAR provides an introduction and a brief background to the project. It describes the EIA consultation and scoping procedures, the structure of the EIAR, the study team and contributors to the EIAR.

Chapter 2 – Planning Policy and Development Context: this chapter of the EIAR provides the legislative requirements under which the document is prepared. It considers the proposed development works in terms of legislative context and in relation to strategic, national, regional and local planning policies and objectives, in order to ascertain whether it is consistent with the relevant legislation and with the proper planning and sustainable development of the area.

Chapter 3 – Description of the Proposed Development: provides a detailed description of the proposed development, which includes details of the site layout and infrastructure. It details the construction procedures and the materials required, the operational and maintenance phases, in addition to the decommissioning and rehabilitation procedures. It also provides a description of the reasonable alternatives, in terms of project design, technology, location, size and scale, which were considered by the Applicant and the Project Team in the preparation of the EIAR.

The remaining chapters in the EIAR are as follows:

- Chapter 2: Planning Policy and Development
- Chapter 3: Proposed Development
- Chapter 4: Land
- Chapter 5: Soil and geology
- Chapter 6: Population and Human Health
- Chapter 7: Biodiversity
- Chapter 8: Water
- Chapter 9: Climate
- Chapter 10: Air Quality

- Chapter 11: Material Assets – Traffic
- Chapter 12: Noise and Vibration
- Chapter 13: Landscape and Visual Impact Assessment
- Chapter 15: Cultural Heritage
- Chapter 16: Interactions of the Foregoing

Chapter 18: Schedule of Mitigation Measures

Each of the chapters providing an examination of specific environmental aspects (Chapters 4 – 12) use the following standard approach and headings:

Introduction – this section specifies the content and background of the subsequent assessment.

Methodology – this section describes the study methodology employed in carrying out the assessment.

Existing Environment – this section provides a description of the existing environment (without the proposed development) into which the proposed development will be located, specifically in the context of the relevant environmental aspects under consideration. This section will also identify any other proposed or existing developments in the vicinity which are relevant to the assessment.

Potential Effects – this section provides a description of the direct, indirect, and cumulative effects, which the proposed development may have on the environment. This is carried out with reference to the existing environment and characteristics of the proposed development, while also referring to the magnitude, duration, consequences, and significance of the proposed development during the construction, operational and decommissioning phases.

Mitigation Measures – this section includes a description of any remedial, or mitigation measures that are either practicable or reasonable having regard to the potential effects. It will also outline, where relevant, monitoring proposals to be carried out should consent be granted in order to demonstrate that the project in practice conforms to the predictions made.

Residual Effects – this section describes the degree of environmental impact that will occur after the proposed mitigation measures have been put in place.

Volume III: Appendices
All supporting documentation and references, referred to in the main EIAR (Volume II) are included in this volume.

1.6 CONTRIBUTORS

Raymond Gilmartin (Agri Consultant) was the lead in the production of the planning application for the proposed development. Raymond has over 20 years' experience in agricultural consultation and assists clients with business planning, planning applications, government grant applications, legislative advice and new business ventures.
The relevant inputs of the various contributors and competent experts of the Project Team are provided below.

- Raymond Gilmartin (agricultural consultant incl land, soils and geology)

- Air Noise and Water (AWN) incl Air, Noise and Vibration
- Moore Group Landscape and Archaeology provided the following contribution to the EIAR, Archaeology, Landscape and Visual.
- TOBIN Consulting Engineers (TOBIN) provided the following contribution to the EIAR, Traffic, Water and Biodiversity.

2 PLANNING POLICY AND DEVELOPMENT CONTEXT

2.1 INTRODUCTION

This chapter considers the proposed development works as described in Chapter 3 of this EIAR (Description of the Proposed Development) (hereafter referred to as the proposed development) in terms of legislative context and in relation to strategic, national, regional and local planning policies and objectives, in order to ascertain whether it is consistent with the relevant legislation and with the proper planning and sustainable development of the area.

Boycetown Land Reclamation is located approximately 1 km west of Kiltale village. Trim and Dunboyne and Kilmessan are the nearest towns, which is over 7km to the northeast and east. The local road lies to the east of the site and the townland in which the site is situated is Boycetown. The site is managed by Davin Plant Hire Ltd.

2.2 SITE PLANNING HISTORY

Two previous application are on the proposed site

- Reference No.: 211565 Date: 07/10/202
- Reference No.: 201666 Date: 10/11/2021

Planning reference 20166 for land reclamation was withdrawn to address retention of the site entrance and to address a change in the applicant. Planning application was submitted 211565 was submitted to address the site entrance retention issues. The proposed application aims to address the issues raised by the previous application in 2020 and to provide up to date traffic counts. The proposed development aims to improve the agricultural land on site. The proposed development will tie into the existing topography to the north and west, retain and enhance biodiversity along the east and to the north of the site.

2.3 NATIONAL GUIDELINES

Guidance on waste acceptance criteria at authorised soil recovery facilities (EPA, 2020)
This guidance document applies to all soil recovery facilities authorised under the Waste Management Act as amended, including the Waste Management (Facility Permit and Registration) Regulations as amended. This includes facilities operating under waste licences granted by the Environmental Protection Agency (the Agency) and those operating under Waste Facility Permits/ Certificates of Registration granted by local authorities. Licences granted by the Agency for soil recovery facilities typically include a condition requiring the licensee to propose maximum concentrations and/ or trigger levels for relevant contaminants in soil and stone proposed to be accepted from non-greenfield sources. This document provides guidance on developing maximum concentrations and/ or soil trigger levels that will be acceptable to the Agency, to comply with this condition. The maximum concentrations and/ or soil trigger levels

specified in this guidance document may also be applied to authorised soil recovery facilities regulated by local authorities.

Authorised soil recovery facilities are often worked out quarries that are in the process of being restored. They may also be sites where soil and stone are being imported to raise natural ground levels. In all cases, soil recovery facilities are authorised to accept only uncontaminated soil and stone.

The criteria under which soil and stone may be accepted at an authorised soil recovery facility from source sites can vary. There are different criteria for material originating from greenfield sites and for material originating from non-greenfield sites. This reflects the increased risk of contamination being present in soil and stone originating from non-greenfield sites.

The waste acceptance criteria under which soil and stone may be accepted at an authorised soil recovery facility from greenfield source sites are outlined below:
A letter of suitability should be obtained for greenfield soil and stone. For facilities with a waste licence, a letter of suitability should be obtained for the first 5,000 tonnes of material received from a source site, and a further letter of suitability for each subsequent 5,000 tonnes of material received from the same source site. For facilities regulated by a local authority, letters of suitability should be obtained at the frequency set out in the standardised national conditions for local authority authorisations.

Each letter of suitability should be signed by a qualified person and should state the following:

- The waste is greenfield soil and stone
- A description of the source and nature of the soil and stone
- The location of the source of the soil and stone (including a map showing the source site boundary)
- The material is suitable for use within the facility
- The material will not cause environmental pollution at the facility

There is no requirement for testing greenfield soil and stone, unless directed by the Agency or local authority. When the material arrives at the soil recovery facility, a visual check is required to verify that the material is greenfield soil and stone. A record of visual checks should be maintained.

Environmental Management in the Extractive Industry (EPA, 2006)
These environmental management guidelines by the Environmental Protection Agency are intended to complement existing guidance and be of assistance to operators, regulatory authorities and the general public. The aim of these Guidelines is to assist in the implementation of the Statutory Requirements, as well as lead to a harmonized regulatory approach to the authorisation and supervision of such activities.

2.4 PLANNING AND DEVELOPMENT CONTEXT

2.4.1 National Spatial Strategy 2002-2020

The National Spatial Strategy 2002-2020 (NSS) was published in November 2002 as a twenty-year coherent national planning framework for Ireland. The stated aims of the NSS were to achieve a better balance of social, economic and physical development across Ireland,

supported by more effective and integrated planning.

In order to drive development in the regions, the NSS envisages that areas of sufficient scale and critical mass will be built up through a network of gateways and hubs. While the National Development Plan 2000-2006 identified Dublin, Cork, Limerick/ Shannon, Galway and Waterford as existing gateways, the NSS designated four new national level gateways and nine strategically located, medium-sized hubs which will support and be supported by the gateways and will link out to wider rural areas. The aims of the NSS were integrated into the National Development Plan 2007 – 2013. Dublin as the capital city plays a vital national role.

However, it requires effective strategic planning and better management of the strong pressures within it to secure and consolidate that role for the future. Dublin and the Mid-east Regions (the Greater Dublin Area) are considered jointly because of their strong interrelationship. It is essential to the NSS that the performance of the economy of the Greater Dublin Area (GDA) and surrounding counties is built upon so that its success, competitiveness and national role are sustained into the future. This means physically consolidating the growth of the metropolitan are i.e. Dublin City and suburbs. At the same time, development in the hinterland of the metropolitan area is to be concentrated in strategic places, strong and dynamic urban centres i.e. the 'Primary Development Centres'. These development centres have a unique role in Irish terms, given the scale of the Dublin City Region and the need for internal balance between the city and its surrounding counties.

Trim, along with the other County Towns (population > 5,000) such as Navan, Balbriggan, Naas/ Newbridge/ Kilcullen and Wicklow comprise the Primary Development Centres. In the context of the NSS, however the future roles of Primary Development Centres such as these must take account of wider considerations, in addition to their relationship to Dublin. Issues that arise in this regard include the question of how such centres can energise their own catchments and relationships with areas in the neighbouring regions of the Border, Midlands and South East. The Primary Development Centres need to aim at a population level that supports self-sustaining growth, but which does not undermine the promotion of critical mass in other regions. This suggests an ultimate population horizon of up to 40,000 people for the primary development centres.

According to the NSS, County Meath is part of the Eastern Region, along with counties Dublin and Kildare. Trim and Dunboyne are the nearest towns. The performance enhancement of the gateway is essential for balanced regional development, according to the Strategy.

The Meath region, in which Boycetown is located, is categorised as having ‘strategic rural assets in a metropolitan hinterland’. Given the site’s close proximity to Dublin, Maynooth and Dunboyne and its convenient access to transport infrastructure, Boycetown Land Reclamation could be a strategic asset to the regional economy of the Eastern Region.

The works at Boycetown Land Reclamation are in line with the growth and spatial planning objectives of the NSS for the Eastern Region.

2.4.2 National Development Plan 2040

The *Ireland 2040 Our Plan – National Planning Framework* was published in 2018. The NPF was developed to succeed the National Spatial Strategy. It provides a framework for national planning, pulling together relevant Government policies and investment on national and regional
development. It will have a focus on economic development and investment in housing, water services, transport, communications, energy, health and education infrastructure.

The *Regional Planning Guidelines for the Greater Dublin Area 2010-2022* (GDA RPGs) were adopted in June 2010 which aims to direct the future growth of the counties Dublin City, South Dublin, Fingal, Dún Laoghaire, Rathdown, Meath and Wicklow over the medium to long term and works to implement the strategic planning framework set out in the National Spatial Strategy (NSS) published in 2002.

The Settlement Strategy guides the future direction of growth and investment by setting and defining the settlement hierarchy and the identification of key growth areas within the GDA. This settlement strategy for the RPG's is focused on achieving the following key principles. Achieving the potential of the GDA as an international Gateway Consolidated and sustainable cities and towns. Supporting high quality public transport and increase opportunities for walking and cycling. It consists of four spatial policy concepts:

1. Continuation of the settlement policy of the GDA divided into the metropolitan and hinterland areas and the setting out of a settlement hierarchy which designates the key growth towns and districts to be consolidated, developed and supported within a sustainable form.

2. Focusing of new housing within the existing built up footprint of Dublin City and suburbs within the metropolitan area of Dublin; and that large scale 74 expansion of this footprint only occurring as part of an integrated plan where there are strong linkages between the lands in question and existing or planned high quality public transport creating opportunity and suitability to expand the built up area.

In term of agriculture National Policy Objective 23 aims to ‘Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism’.

National Policy Objective 25 states that ‘The Department of Rural and Community Development, the Department of Agriculture, Food and the Marine, and other relevant Departments and Agencies will continue to invest in rural Ireland, including through the Rural Regeneration and Development Fund, and will work together to establish a mechanism to co-ordinate structures for funding rural development to align with other national strategies’.

2.4.3 Food Wise 2025

Food Wise 2025 sets out a ten-year plan for the agri-food sector. It underlines the sector’s unique and special position within the Irish economy, and it illustrates the potential which exists

for this sector to grow even further. At farm level, the improved profitability and viability of enterprises will remain a pressing concern in the decade ahead. The Food Wise 2025 strategy was agreed by a committee of 35 stakeholders from the agri-food sector. It foresees a sector that acts more strategically and achieves a competitive critical mass in the international marketplace while targeting more quality conscious consumers who will recognise and reward Ireland's food producers for their sustainable production and high-quality produce.

At farm level, challenges associated with price and income volatility require farmers to focus on improving profitability for their enterprises by managing input costs and maximising the price received from the market. This margin maximising approach will support continued improvements in the economic viability of full and part time family farm enterprises into the future and the development of vibrant rural economies. Farmers must adopt, and be encouraged to adopt, the latest technologies and processes to increase sustainable productivity which will result in increases farm level profitability. Increases in productivity will drive the continued development of Irish farm business enterprises, making them more sustainable and maximising their contribution to regional and local rural economies. Irish family farms are facing particular challenges related to the scale of their operations and the fragmentation and structure at farm level which are limiting the capacity of the sector to develop sustainable and viable business enterprises.

The proposed development will help in the long-term sustainability off the landholding. High quality topsoil which may otherwise be discarded will be utilised to provide high yielding agricultural outputs on the farm.

2.4.4 Meath County Development Plan 2013-2019

Under Section 9 of the Planning and Development Acts, each local authority is required to prepare a development plan every six years. The Meath County Development Plan 2013-2019 is the current statutory plan for the county.

The development plan vision statement is for "Meath to be a county that fosters sustainability throughout its vibrant communities, dynamic economy and unique cultural and natural heritage".

The Meath County Development Plan 2013-2019, Chapter 10 section 12 lists several policies in relation to the proposed development. Some of the policies relevant to landscape and visual impact are stated below:

***RD POL 22**: To facilitate the exploitation of the county's natural resources and to exercise appropriate control over the types of development taking place in areas containing proven deposits, whilst also ensuring that such developments are carried out in a manner which would not unduly impinge on the visual amenity or environmental quality in the area.*
***RD POL 24**: To seek to ensure that the extraction of minerals and aggregates minimise the detraction from the visual quality of the landscape and do not adversely affect the environment or adjoining existing land uses.*

Waste management policy objectives stated in the Development plan include:
WM OBJ 1 To facilitate the provision of appropriate waste recovery and disposal facilities in accordance with the principles set out in the appropriate Waste Management Plan applicable from time to time made in accordance with the Waste Management Act 1996

WM OBJ 7 To promote the implementation of Waste Management Activities in accordance with Best Practice and national policy.

WM OBJ 8 To facilitate the implementation of national legislation and national and regional ware management policy.

WM OBJ 13 To support the development of facilities to cater for commercial waste not provided for in kerbside collection systems such as WEEE, C&D type waste and hazardous materials in accordance with the requirements of the North East Waste Management Plan.

WM OBJ 17 To require developers to prepare construction and demolition waste management plans for new construction projects over certain thresholds which shall meet the relevant recycling / recovery targets for such waste in accordance with the national legislation and national and regional waste management policy.

WM OBJ 18 To seek to ensure cooperation with the relevant authorities that waste management facilities are appropriately managed and monitored according to best practice to maximise efficiencies and to protect human health and the natural environment.
In addition, one of the core principles of the Meath County Development Plan is 'To support agriculture and agricultural related development in Meath and strengthen the county as a hub for the vibrant agricultural and food sectors'.

Other relevant policies include:
RUR DEV SO 6 To protect and enhance the visual qualities of rural areas through sensitive design.

RUR DEV SO 7 To support the continuing viability of agriculture, horticulture and other rural based enterprises within rural areas and to promote investment in facilities supporting rural innovation and enterprise with special emphasis on the green economy, in the context of sustainable development and the management of environmental resources.

RD POL 12 To facilitate the development of agriculture while ensuring that natural waters, wildlife habitats and conservation areas are protected from pollution.

2.4.5 Draft Meath County Development Plan 2021 -2027

The *Meath County Development Plan 2013-2019 is the current statutory plan for the county. The Meath County Development Plan 2020- 2026 (now to 2021 to 2027) sets out the policies and objectives and the overall strategy for the development of the County over the plan period.*

INF POL 61 To facilitate the implementation of National Waste legislation and National and Regional Waste Management Policy.

INF POL 63 To encourage the development of waste infrastructure and associated developments in appropriate locations, as deemed necessary in accordance with the requirements of the current Eastern Midlands Region Waste Management

INF OBJ 55 To facilitate the transition from a waste management economy to a green circular economy to enhance employment opportunities and increase the value recovery and recirculation of resources.

INF OBJ 56 To facilitate the provision of appropriate waste recovery and disposal facilities in accordance with the principles set out in the appropriate Waste Management Plan applicable from time to time made in accordance with the Waste Management Act 1996 (as amended)

INF OBJ 60 To seek to ensure, in cooperation with relevant authorities, that waste management facilities are appropriately managed and monitored according to best practice to maximise efficiencies to protect human health and the natural environment.

2.5 CONCLUSION

Site development works and infrastructure developments can produce a surplus of excavated soils that ends up at landfills. This practice is not sustainable, and approaches are needed to reduce soil waste and minimize environmental impacts.

The proposed site can operate in a sustainable and environmentally sound manner with due regard to the local community. This approach to sustainability will continue and will incorporate the works proposed as part of this application.

The proposed land reclamation works will have the following beneficial impact upon agriculture:

- Firstly, the lands will be reclaimed to more productive agricultural lands which will result in greater grass yields and therefore greater potential agricultural benefit.
- The value of the reclaimed land as good agricultural grazing lands will increase as a consequence of the recovery activity which will have a long-term agricultural benefit.

This chapter also demonstrates that activities at Boycetown Land Reclamation are consistent with the aims and objectives of local and national policy including Meath County Development Plan 2013-2019, Draft County Development Plan 2021-2027, the Eastern Regional Planning Guidelines 2010-2022, the National Spatial Strategy 2002-2020 and the National Development Plan 2018-2027[1]. The construction sector has undergone significant expansion following the relatedly depressed state in recent years, Boycetown Land Reclamation can play an integral role in the sustainable growth of the region.

3 DESCRIPTION OF PROPOSED DEVELOPMENT

3.1 DESCRIPTION OF THE EXISTING SITE LOCATION

Boycetown Land Reclamation is located in a primarily agricultural area within the townland of Boycetown, Dunsany, County Meath approximately 1 km west of the village of Kiltale, County Meath (refer to Figures 1.1. and 1.2). There are a number of residential properties located to the south east of the Boycetown Land Reclamation and are located along the local road to south and southwest of the site boundary. There are also a number of farm buildings in the vicinity of Boycetown Land Reclamation which would be expected as this is a primarily agricultural area. A number of Agri-industry buildings are located to the southwest of the site.

The closest surface water feature is a drainage ditch to the east of the land reclamation site. The Boycetown River is located 300 m northeast of the proposed development. Figure 1.1 and Figure

[1] This was replaced in Autumn 2017 by 'Ireland 2040 – Our Plan'

1.2 illustrate the overall layout and cross section of the site and the areas of the site that are the subject of this EIAR i.e. the planning application area.

The overall landholding is approximately 13 ha and the topography of the applicable area within the site varies from approximately 70 mOD at the lowest level of the worked area to approximately 75 mOD at the highest point.

Infrastructure associated with the land reclamation comprises landscaped earthen berms surrounding most of the active area, offices and associated canteen facilities, settlement lagoons, wheelwash and sprinkler system and a weighbridge. The field boundaries are comprised of a mixture of hedgerows and fencing with the entrance to the site located on the local road along the eastern boundary of the site.

Regular monitoring of various environmental parameters will carried out as part of the operations at Boycetown Land Reclamation, including the quality of surface and groundwater, noise levels and dust emissions.

3.1.1 Do-nothing Scenario

If the proposed land reclamation works did not proceed, the current area would remain in-situ a lower value agricultural site. The existing application area is described in detail in the Biodiversity section of this report.

3.1.2 Reasonable Alternatives

Apart from further drainage works at Boycetown Land Reclamation (that would be subject to a separate planning application), there is no other reasonable alternative to the proposed land reclamation works currently envisioned for the application area that is the subject of this planning application.

In developing the proposed land reclamation scheme, the landowner has considered the requirement for alternatives, where possible and practicable. Given that the stone and soil materials imported to the facility are effectively re-used for a beneficial purpose, and in place of naturally occurring non-waste materials, there is no scope for further material recovery and/or recycling. As the materials imported and recovered at the facility are inert, there are no associated emissions of potentially contaminated substances to ground, groundwater and/or the atmosphere. Noise and dust emissions are controlled and monitored to comply with such limits and conditions. The site is underlain by low permeability soils and therefore the potential to impact on groundwater is lower than quarry backfill sites.

The infilling and reclamation of the existing site will, for the most part, only require utilisation of conventional HGV trucks and earthmoving equipment. As the materials used at the site are inert, there is little scope to further limit, abate and/or reduce emissions. In controlling emissions from the site, greatest emphasis will be placed on implementing an effective Environmental Management System. No hazardous or non-hazardous materials (other than diesel fuel and engine oils) will be used in restoring the site. There is currently no alternative to diesel fuel to power the earthmoving equipment which will be in use at the facility.

Operational soil facilities are currently struggling to meet the demand for soil recovery generated by the recent housing activity in the construction and development sectors around the Greater Dublin Area.

3.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Davin Plant Hire Ltd. have prepared this EIAR to accompany a Planning application for the purpose of importation of inert excavation spoil comprising natural materials of clay, silt, sand, gravel or stone for the purpose of land reclamation of an area located at the north-eastern end of Boycetown Land Reclamation. It is intended that 200,000 tonnes of inert excavation material will be imported to fill the current depression/hollow, which will then be top soiled and regenerated with grass-seed. This material will be sourced from local construction projects in the vicinity of the site.

This application is in line with the Fourth Schedule, Waste Management Act 1996 as amended[2] R10 - Land treatment resulting in benefit to agriculture or ecological improvement. This covers the use of organic and mineral wastes as fertilisers or soil conditioners in agriculture; other applications of waste on land on which no food and feed crops are cultivated, and which result in ecological improvement such as landscape restoration.

It is proposed to apply for a waste permit from Meath County Council in accordance with the third schedule Part I and Part II of the Waste Management (Facility permit and registration) Regulations 2007, as amended. The class under the - R5 Recovery of excavation or dredge spoil, comprising natural materials of clay, silt, sand, gravel or stone and which comes within the meaning of inert waste, through deposition for the purposes of the improvement or development of land, where the total quantity of waste recovered at the facility is less than 200,000 tonnes.

Consultation with the EPA will be undertaken to address if Article 27 of the European Communities (Waste Directive) Regulations, 2011 is also applicable in this instance. It is proposed to utilise article 27 material to construct landscaping berms, access track and to provide a sustainable option to topsoil the site.

3.3 THE OPERATION

3.3.1 Placement of material

The initial phase involves installing a access track, infrastructure, berm and settlement lagoon. It is proposed to place the soil using a loose tipping method. This method entails placing soil sequentially across the soiling area. A hydraulic excavator, fitted with a toothed bucket to avoid excessive smearing, should be used to load the soil materials from the source area or stockpile into a dump truck which then discharges them onto the receiving surface. An excavator or dozer stands next to the newly dropped soil and spreads this to the required thickness. Both topsoil and subsoil along the whole length of the strip is restored with subsoil before the process is repeated with topsoil. The topsoil is lifted onto the subsoil without the excavator travelling on the newly placed subsoil. Only when the strip has been completed is the next one started. If soil is cloddy in structure, the excavator bucket can be used to break up the clods. Large stones can be removed during the operation. Modified versions of the loose-tipping method, for use when both subsoil and topsoil are to be placed, include spreading the subsoil as described above but then spreading the topsoil layer out using a low ground pressure dozer.

[2] Please note that backfilling is a recovery operation which doesn't have a clear assignment to the recovery (R) codes, but there are legislative reporting obligations for backfilling operations.

After respreading topsoil, any large, compacted lumps should be broken down by appropriate cultivation to produce a fine tilth suitable for planting. Undesirable material (e.g. stones, fill materials and vegetation larger than 50mm in any dimension) brought to the surface during cultivation should be removed by picking or raking.

3.3.2 Working Hours

The proposed working hours for the activities proposed as part of this application are 0700-1800 hrs Monday-Friday and 0800-1400 Saturday. The site will not operate on Sundays and Public Holidays unless warranted by exceptional circumstances and agreed in advance with the Local Authority.

3.3.3 Site Security Arrangements

The security arrangements include the existing post and wire fencing (in addition to hedgerows and trees in places) around the entire boundary of the site and a secure gate at the main entrance on the public road. Warning signs have been placed at perimeter fencing regarding the on-site operations. Guard dogs will be on patrol at the site entrance outside of operational hours.

The site setting and residential owner aids site security. The existing hedgerow, scrub and fields along the boundaries of the site naturally prohibit unauthorised entry.

The security measures employed ensure that accidental entry to the site is prohibited. Regular inspections of the site security arrangement are undertaken by site operatives and repaired immediately if any damage is noted.

3.3.4 Employment

Davin Plant Hire Ltd. will employ 4 personnel on an annual basis at Boycetown Land Reclamation, both directly and indirectly. Permanent employees include site personnel, administration staff and maintenance personnel, who are based at offsite locations.

Indirect employment is generated as a result in terms of contract aggregate transport drivers, suppliers of products and services, such as fuel and oil suppliers, machinery suppliers, etc.

3.3.5 Plant and Equipment

All plant and equipment used within the application area is a mixture of fixed and mobile in nature. The following plant is proposed:

- Bulldozer
- Tracked excavator
- Wheel wash
- Office facilities
- Weighbridge and
- Toilet facilities

3.3.6 Traffic Control

All traffic accesses the facility directly at the site entrance located on the local road (L6202-3). Entry to the site is via an existing 8m entrance and proposed designated access track to the infill area. The weighbridge next to the administration building is reserved for outgoing loads,

therefore there are no delays entering the site and backups on the public road is not envisioned to be a problem at this location due to the limited traffic volumes proposed.

3.3.7 Working Method

The working method within the Planning application area will comprise the infilling of the low-lying area with inert excavation material. Testing procedures are outlined below.

Inert soil

The source of each consignment of soil imported to site for backfilling purposes shall be identified in advance and subject to basic characterisation testing to confirm that soils at that location can be classified as inert. Limit values for inert soils shall be in accordance with those set by European Council Decision 2003/33 of 19 December 2002 establishing criteria for the acceptance of waste at landfills and the EPA (2019) Guidance on waste acceptance criteria at authorised soil recovery facilities. Characterisation testing will be undertaken in advance by Clients and/or Contractors forwarding soil to the application site. It is also suggested that site management visits to each source site will determine the nature of the ongoing development prior to the commencement to receive material from that site.

All inert soils imported to the site shall be unloaded from trucks at the active phase. It will be visually inspected at the weighbridge and then by site personnel at that point to ensure that there is no waste placed within it. Should there be any concern about the nature of the waste being tipped out, it will be segregated (if required), re-loaded onto the truck and directed to the waste inspection and quarantine area for closer inspection and classification. A detailed record will be kept of all such inspections. Should inspections and/or subsequent testing indicate that the materials are non-inert and cannot be accepted and used for land reclamation purposes at this site, they will be placed in skips and covered pending removal off-site by permitted waste collectors to a suitably licensed / permitted waste disposal or recovery facility.

3.3.8 Material Inspection and Quarantine

The clean inert soils to be accepted at the facility, is limited to uncontaminated natural soils, sub-soils, stone and rock as defined by the European Waste Catalogue classification under 17 05 04. All imported materials will be inspected as it enters the site. Contracts will be in place whereby only greenfield sites can provide material to the site. Invasive species will be prohibited from entering the site.

Waste Quarantine Areas

If inappropriate material is identified during inspection, it will be removed to a waste quarantine area before removal from site. It is proposed to use skips within a secure area for storage of quarantine rejected waste. This is be located near the proposed offices.

3.3.9 Testing

Monitoring of noise, dust, surface water will be undertaken at the proposed facility. Laboratory testing of soil, surface water will be undertaken off-site at an ILAB accredited laboratory. Any testing and laboratory testing required to confirm classification of waste as inert will also be undertaken by the same laboratory. All samples taken on-site will be forwarded to the laboratory and test results will typically be forwarded to site within ten working days.

3.3.10 Fuel Storage

No fuel will be stored on site for the activities proposed in this application as the HGVs delivering material will be fuelled off site. The bulldozer that will be used on site to level out the incoming

material will also be fuelled by a mobile diesel tank. A spill kit will be available at the site for any minor fuel spillages.

3.3.11 Sewerage and Waste Water Treatment

Wastewater will be generated from the office and toilet facilities on the site. Due to the temporary nature of the land reclamation, it is proposed to tanker all wastewater discharges for the development off site.

3.3.12 Water Management

Surface water management will be in place at the Boycetown Land Reclamation. Surface water features within Boycetown Land Reclamation comprise runoff to the surface water and will pass through the surface water retention pond.

The proposed development is to actively manage the surface water in a sustainable manner on site. The proposed swale and settlement pond will collect runoff from the land reclamation site. The settlement ponds collect runoff from the land reclamation site and the general areas. Water is recycled within the site for activities such as dust suppression.

Areas within the landownership boundary have not been excavated to date and are currently under vegetation and it is implicit that the general drainage from these areas is through the underlying natural overburden material.

Within the application area, diffuse groundwater recharge to the underlying aquifers is through the existing quaternary deposits. There are no point sources, such as swallow holes etc. recorded within the application area.

Flood peak flows are attenuated by the capacity of the swale and the capacity of the settlement lagoons. Davin Plant Hire Ltd. will carry out monitoring on a quarterly basis.

The site is located in an area of high Pollution Impact Potential for phosphate. Phosphate losses are highest in area with overland flow, where the soil is poorly draining such as that of the proposed site. the proposed development will reduce/eliminate poorly drained soils on the site.

The use of free draining mineral soils in the land reclamation area along with pathway mitigation (settlement pond), compliance with the Good Agricultural Practice Regs, which include pathway interception measures (e.g. setback distances) and Improved nutrient management with more targeted use of fertilizers, will reduce phosphate losses in the site.

3.3.13 Vehicle/Wheelwash Water

The wash water from the vehicle/wheelwash bay is recycled through an in-built water recycling system. It is proposed to use a Moby dick system to reuse/recycle water. This is occasionally topped up with fresh water from the onsite water pond or from the existing borehole. A sprinkler system along the main access track will ensure all material is dampened prior to exiting the location.

3.3.14 Drinking Water

Drinking water for the site is supplied by a private well located onsite near the east of the site.

3.3.15 Solid Waste Management

Davin Plant Hire Ltd. minimise production of waste and where appropriate consider its beneficial use, including recycling. All waste is dealt with in accordance with the relevant legislation and other controls in place. Good practice is achieved when recycling used oils and greases, batteries, tyres, scrap metal and timber.

3.3.16 Access and Transport Routes

The existing access to Boycetown Land Reclamation is from the Local road L6202-3. Access into Boycetown Land Reclamation is via a gated road with a carriageway approximately 6 m in width.

Davin Plant Hire Ltd. will ensure that vehicles leaving their operations are effectively cleaned and sprayed by a wheel and vehicle washing facility to prevent the spread of dust and aggregate on to the public highways. Davin Plant Hire Ltd. will clean, when necessary, any dirt and debris from any road surfaces soiled as a result of spillage due to haulage to and from the site.

3.3.17 Site Management

A competent management structure is in place onsite at all times, under the direction and supervision of a Site Manager.

3.3.18 Nuisance and Pest Control

It is not envisaged that the proposed development will attract birds or scavenging mammals. It is also envisaged the proposed development will not be a generator of litter.

3.4 DECOMMISSIONING

The purpose of the stone and soil importation is to provide productive agriculture on the site. Upon cessation of activities all plant and machinery shall be removed from site. Topsoil and subsoil will be spread over the operational area. Land reclamation grass mix will be sown over the area and maintained by an experienced landscaping contractor until it has taken hold. Fertilisers and weed management will be implemented where required.

The initial focus will be improving and developing grass production and utilisation on the farm. Soil samples will be taken, and soil fertility results will provide and aid to optimum grass production. Following testing, a fertiliser plan will be drafted; this is consistently revised each year.

Although correcting and maintaining an ideal soil fertility status on the farm ensures optimum grass production, a number of infrastructural changes need to take place in order to enhance grass utilisation. Implementing a rotational grazing system for the cattle would encourage more grass growth and allow the animals to achieve higher performance from grass being offered. In order to provide a better water quality to cattle and protect the drainage channel – i.e. prevent cattle access to the stream, a well and cattle operated nose pump will be installed. While pushing the animal activates a diaphragm drawing the water through the tube of the Aquamat pasture pump. A non-

return valve prevents the pump from running dry. Releasing the mechanism, the water flows into the small bowl under the rush lever. The drain will be fenced off from cattle access. The Aquamat Pasture pump allows cattle to be completely fenced away from streams, lakes and ponds, while allowing them access to fresh water at all times.

Plate 2 – Example Cattle nose pump on groundwater well

3.5 VULNERABILITY OF THE PROJECT TO RISKS OF MAJOR ACCIDENTS AND/OR DISASTERS

As part of the requirements of the new EIA Directive, the applicant is requested to consider the "Expected Significant Adverse Effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned."

As the proposed project involves the importation of inert excavation spoil comprising natural materials of clay, silt, sand, gravel or stone for the purposes of land reclamation within Boycetown Land Reclamation, it is not expected that the project will result in significant adverse effects on the environment as a result of any major accidents and/or disasters. The area that is the subject of this planning application, a 5.6 ha land reclamation area including the access track (13 ha landholding), is confined to a localised area within an overall landholding that is under the control of the developer. The material is inert, and the works will be temporary. In addition, there is no history of major accidents and/or disasters e.g. any natural disasters, in the local or regional area of the proposed development, Therefore, it is submitted that this project is not vulnerable to risk from a major accident and/or disaster that might have a significant adverse effect on the environment.

The management of any risk of accidents will be mitigated through Standard health and safety precautions and procedures in accordance with the Health and Safety Regulations (Construction), 2013. The risks associated with such work are those that are commonly

associated with working with machinery and assuming standard health and safety procedures are adopted, implemented and complied with, the risk of accidents is low.

The management of any potential environmental accidents will be managed through the adoption of site best practises outlined in the EMS. With particular reference to the EMS, specific procedures have been developed with regards to waste acceptance and waste quarantine which has to ensure that no hazardous or unacceptable material is used in the land reclamation and recovery process; therefore minimising the risk to sensitive habitats or the environment. Additionally, there is no proposed fuel storage at the site, refuelling and fuel handling procedures on top of an emergency response procedure have been developed therefore minimising the risk of major accidents.

A hydrological assessment was undertaken at the site by Envirologic in January 2018, which included a flood risk assessment to determine whether the site is at risk from extreme fluvial flooding events. This report is discussed in Section 8 and concluded that the site is not at risk from extreme flooding.

It can be concluded that the risk of accidents associated with this development is very low and would not cause unusual, significant or adverse effects on human health or the environment.

3.6 REASONABLE ALTERNATIVES

Apart from further land reclamation (drainage) works at the proposed development at Boycetown Land Reclamation (that would be subject to a separate planning application), there is no other reasonable alternative to the proposed restoration works currently envisioned for the application area that is the subject of this planning application. At present in the eastern region, there is a critical shortage of waste permits / waste licence sites with capacity to accept clean inert stones and soil. Without the proper waste permit / waste licence sites, critical infrastructure may be delayed or postponed indefinitely. It is critical to provide the required sites for inert stones and soil.

The predicted capacity shortfall clearly has the potential to be a significant constraint for market operators and construction activities in the regions in future years. As is stated in the Soil Recovery Market Analysis Report (RPS, 2016[3]) It is planned to spend €42 billion of capital expenditure over the next 5 years on public infrastructure and a further €5.3 5 billion on social housing. This is a massive injection into the Irish economy.

It is estimated that some €15 billion alone will be spent in 2016. According to the Budget 2021, t he Irish economy is growing strongly with GDP growth forecasted at 3% in 2021 - next year. The realisation of these infrastructural and housing projects will generate significant volumes of soil waste and a health supply of recovery capacity is required. Both infrastructure and housing are c omplementary as without adequate infrastructure provision, the provision of housing will not generate communities properly served by transport, water, schools and amenities.

The recent growth in construction activity has brought to a head an unexpected supply chain issue.

[3] Eastern Midlands Region / Connacht Ulster Region / Southern Region Waste Management Plans 2015 - 2021

There is a significant shortfall in the provision of recovery sites for excavated soil and stone to en able the planned infrastructure and housing strategy to be realised.

4 LAND (AGRONOMY)

4.1 INTRODUCTION

4.1.1 Guidance Used in the Land Impact Assessment

This chapter describes the effects on Land of the proposed development at the Boycetown, County Meath in accordance with the relevant Environment Protection Agency (EPA) Guidelines. The following sources and guidelines were used in the assessment:

- '*Guidelines on the Information to be contained in Environmental Impact Statements*', EPA, 2002;
- '*Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*', EPA, 2003;
- "*Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports*", EPA, August 2017;
- Meath County Development Plan; and
- Ordnance Survey Ireland, 1:50,000 Discovery Mapping.

The amended Directive introduces *Land* as a prescribed environmental factor. Recital 9 gives context to this addition, showing that it relates to the issue of '*land take*'. This change aligns the Directive with proceedings of the United Nations Conference on Sustainable Development (Rio de Janeiro, 2012) and with Commission strategy. As detailed in the "*Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports*", EPA, August 2017, Article 3(1) of the amended EIA Directive requires that the environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on a number of factors including *Land* (listed separately). The Guidelines also provide the list of Environmental Factors to be considered in Figure 3.1 and again *Land* is included as a separate bullet point. Land (with a focus on land use; land take) is therefore included as a separate chapter in this EIAR.

4.1.2 Characteristics of the Proposed development

A detailed description of the proposed development is provided in Chapter 3.

4.2 RECEIVING ENVIRONMENT / BASELINE DESCRIPTION

4.2.1 Site Location

The Farmland, as outlined in blue in Chapter 1 on Figure 1.1, is located within the County Meath townlands of Boycetown.

The application boundary, outlined by the red line on Figure 1.1 (which is defined as the area in which the application for development is being made and within which all activities associated with the proposed development will occur), will be confined to a landbank of approximately 5.6 ha.

The permitted restoration operates subject to an waste permit and subject to the planning approval for the facility. Access into the site has been provided from the local road via a dedicated site entrance.

4.2.2 Land Use

The proposed development is located within a segment of land within the landholding, which is located to the west of the existing access road. The land within the site boundary consists of flat low lying land with a gently undulating topography typical of the area. It is marginal land which is not farmed intensively. The soil here is poor quality as indicated by the rushes present.

Land use on and adjacent to the proposed development site is primarily low intensive and productive agricultural lands. There are no public amenities on the proposed development site such as walking routes. There are no agricultural, horticultural or commercial forestry activities taking place on the subject lands.

Immediately adjacent to the proposed development site there are areas of land where agricultural usage are evident. The remainder of the landholding not subject to this development contains better quality agricultural land which is farmed more intensely. There is a greater depth of soil on the remainder of the lands again indicated by the presence of ryegrass and the absence of rushes.

Plate 1: View of proposed location from existing access

4.2.3 Topography

The proposed site is situated in relatively flat low-lying area with levels ranging from 71 to 74 mOD. Whilst the topography throughout the overall landholding is also relatively flat, screening of the site operations from the adjoining roads will be provided by existing hedgerows and tree lines, which will be augmented by additional planting surrounding the proposed development.

The remote nature of the location of the facility footprint provides considerable separation distances between the proposed development and adjacent roads. The site is surrounded by hedgerows with mature trees which will provide a natural buffer screening the facility.

4.2.4 Likely Future Receiving Environment / Do Nothing Scenario

All components of the baseline are constantly changing due to a combination of natural and human processes. When predicting likely direct and indirect effects it is important to remember that there are two available for comparison: the existing baseline environment and the future baseline environment without the implementation of the proposed development but considering natural changes only.

In land use terms, if the development did not go ahead, the proposed development site will remain as an area of poor grassland. The succession and maturing of vegetation will continue depending on a number of factors for example existing soil / peat conditions, the likelihood of erosion, water levels and the re-establishment of a balanced ecosystem.

4.3 POTENTIAL EFFECTS ON LAND

4.3.1 Land Use

This section outlines the potential direct or indirect effects on the land (land use) at the proposed development site which are closely related to the scale and nature of the proposed development.

The redline application area of 5.6 ha, includes an area of approximately 5.2 ha where restoration will take place. The proposed development, described in detail in Chapter 3, will be gradually developed, creating a new agricultural land form within the site. The change of land use at the proposed development site will also include the construction of buildings, surface water attenuation lagoons within the site.

The proposed development will significantly improve grassland performance at the site, advantages including:

- Better access to land via access track;
- Fewer wet areas to avoid;
- Improved crop yield and quality;
- Improved plant performance;

- Reduced duration/ risk of autumn waterlogging;
- More rapid warming of soils in spring, improving germination;
- Better access to water and oxygen for plant roots;
- Better crop uptake of soil mineral nitrogen and reduction in phosphate runoff;
- Quicker accessibility of fields following any period of wet weather;
- Crop inputs more likely to be applied at optimum time;
- An extended growing and grazing season;
- Improved trafficking speed of work and fuel use; and
- Better traction

The proposed development will continue the emerging trend within the land holding at the Boycetown of land changing in use from poorly productive to good quality agricultural land. At present the soil here is very poor. Any top soil will be removed and stock piled while the site is being filled. When the site is filled the top soil will be re-spread over the filled material and extra top soil will be imported if necessary to turn this area of barren ground into productive agricultural land. Drains will be placed in the filled material to help make this land more productive.

There are no horticultural or commercial forestry activities taking place on the subject lands. The proposed development will result in the regeneration of productive land for potential agricultural or other beneficial uses. This will add to the aesthetic value of this land as well as making it more productive.

Direct and permanent change to the land will occur locally where the proposed development will be physically located resulting in a land take for the proposed development and change in land use at the proposed site. The magnitude of change within the proposed development site is considered slight beneficial.

4.4 MITIGATION MEASURES

Mitigation is a term used to describe the measures or actions that may be taken to minimise environmental effects. The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant adverse direct and indirect effects on the environment arising from the proposed development.

If sustained heavy rainfall (e.g. >10mm in 24 hours) occurs during operations, work must be suspended and not restarted until the ground has had at least a full dry day or specified soil moisture content can be met. Lighter soil (e.g. free draining sandy soil) can generally be moved at higher moisture content with less risk of damage when compared to a heavy soil (e.g. clayey soil). The earlier or later in the year that soil is moved, the greater is the risk of causing damage or having work suspended by adverse weather. Where the soil handling technique is such that trafficking over the soil is minimal the period may be extended.

Given the scale and nature of the proposed development and that the most significant effect on the land is due to the actual physical imposition of the development on the land the possibility of mitigation measures is somewhat restricted. However, the following mitigation measures are proposed for the facility.

Retention of all existing perimeter planting and re-generating vegetation where possible. Disturbance of existing vegetation will be minimised where possible and proposed planting will help integrate the proposed development into the current land use. The main long-term mitigation measure will be the staged topsoil and grassing of the area. The lands will be reseeded once the top soil has been spread over the filled material. This will make this land more fertile and more productive. Drains may be required to help soakage in the soil.

4.5 RESIDUAL EFFECTS

Effective implementation and establishment of proposed mitigation measures will have a beneficial impact and help to reduce effects associated with the proposed development on the current land use.

4.6 CONCLUSION

The scale, nature and physical footprint of the proposed development will have a long-term slight beneficial effect on the land use at the proposed development site. There are positive environmental factors to consider by turning this current barren piece of ground into fertile agricultural land. Firstly the current vegetation would be poor at absorbing nutrients from the soil and from the atmosphere. The reseeded of this area when complete would give rise to much better nutrient uptake by the new grasses. Also the aesthetic value of the newly reseeded grassland would be much higher. This development will enhance the locality.

5 POPULATION AND HUMAN HEALTH (SOCIO-ECONOMIC)

5.1 INTRODUCTION

Human beings and their health and socio-economic environment are an essential element in the EIAR process. Quality of life must not be degraded as a result of development and both the short and longer-term impacts on the local population must therefore be addressed at this stage. The purpose of this chapter is to examine the socio-economic conditions in the area surrounding Boycetown Land Reclamation, County Meath.

This chapter will focus on population, employment, tourism and amenities. The issues of water quality, dust, noise and traffic are dealt with individually in Chapters 8, 9, 11 and 14 respectively.

5.2 METHODOLOGY

A desk-based assessment was carried out and the following documents were consulted:

- National and Regional Planning Policy (NSS, NDP, RPGs);
- Meath County Development Plan 2013-2019;
- Draft Meath County Development Plan (2021-2026);
- National Monuments Service *Map Viewer* (2020);
- Central Statistics Office (CSO) online database (2020);
- Fáilte Ireland website (2019); and
- Ordnance Survey maps and satellite imagery.

5.3 RECEIVING ENVIRONMENT

Boycetown Land Reclamation is located in low lying area in southeast County Meath, west of Kiltale. The topography is generally flat or rolling lowland. Artificial land drainage systems are a feature of the land in the area. Tillage and beef farming are dominant in this part of the county.

5.3.1 Site Description

The local road runs along the eastern edge of the site, providing the main access to the site. Settlement around the site is limited and takes place along two local roads. The immediate surrounding land is relatively fertile and used for grazing and small-scale farming. Kiltale is the closest settlement (approximately 1 km) and lies further along the R154 between the site and Kiltale. This clustered settlement occurs at a junction of several local roads.

The Planning application area is located to the east of the farmyard, within the landholding.

5.3.2 Land Use

According to the County Meath Landscape Character Assessment, Boycetown Land Reclamation is situated in the Central lowlands landscape. Vegetation is dominated by pastureland broken up by tillage in the gently sloping (where Boycetown Land Reclamation is

located) with an interspersed spread of thick hedgerows, scrub and treelines. The rolling lowland nature of the landscape results in some visibility from some minor roads and occasional views of the surrounding landscape are possible from elevated areas. No views are present onto the site. Many of the roads are lined with hedgerows which limit views into the landscape.

Agriculture in Meath supports thousands of jobs in the rural economy, both directly in food & drink processing and also in the wider Agri-industry, including input suppliers, agricultural contractors, jobs in auctioneering, transport and engineering and in accountancy, legal, veterinary and other advisory services. There are over 2,000 food and drink processing jobs supported by agricultural output of county Meath.

An existing LV overhead powerline crosses the site and it is proposed to realign prior to establishment of the site. A temporary ESB connection will be required for the duration of the works. This connection will be provided off the adjoining powerline from the Electricity Supply Board Networks (ESBN). Temporary welfare facilities, including toilets / washrooms / shower facilities, and office accommodation will be installed on-site for the duration of the construction period. Provision will also be made for waste collection with segregated skips provided for separate waste types generated.

5.3.3 Population

Meath County Development Plan 2013-2019 classifies Kiltale as a small village. According to the Census 2016 results, Kiltale and the surrounding area has a population of 600. Overall, the population of County Meath stands at 195,044, which represents a 5.8% increase from 2011 to 2016.[4]

5.3.4 Employment

Employment is an important indicator of the economic standing of an area.

The labour force survey (LFS), published by the Central Statistics Office, provides details of unemployment on a regional level, replaced the Quarterly National Household Survey (QNHS) in 2017. County Meath is located in the Mid-East Region, which had an unemployment rate of 5% in the last quarter of 2019.

The LFS is the official source of labour market statistics for Ireland including the official rates of employment and unemployment. These official measures are based on the International Labour Organisation (ILO) concepts and definitions. The ILO measures are the international standard and all EU Member States are legally obliged to compile and provide this data to Eurostat on a quarterly basis through the LFS. These ILO criteria are one reason why the LFS may not fully capture the impact of COVID-19 on the labour market (CSO, 2020).

Since March 2020, the CSO has been producing a supplementary measure of monthly unemployment in parallel with the routine Monthly Unemployment Estimates, which incorporates those in receipt of the Pandemic Unemployment Payments into the calculation to produce a COVID-19 Adjusted Measure of Monthly Unemployment. This new measure was most recently published as part of the Monthly Unemployment Estimates release for July 2020 and will continue to be made available for as long as deemed necessary by the CSO.

As part of the process to generate estimates for the LFS for Q1 2020, the CSO also made a COVID-19 Adjusted Measure of Employment available. These estimates have been updated as

[4] CSO (2016), http://www.cso.ie/px/pxeirestat/Statire/SelectVarVal/Define.asp?maintable=E2016&PLanguage=0

part of the preparations for publishing this Q2 2020 LFS release today. The estimate for the end of Q2 2020 is calculated by subtracting those who were in receipt of the Pandemic Unemployment Payment at the end of June 2020 from the numbers in employment during Q2 2020. A corresponding estimate has also been produced for the end of July 2020.

Using the standard International Labour Organisation (ILO) criteria, the unadjusted number of persons aged 15 years and over in employment stood at 2,222,500 in Q2 2020 with an associated Employment Rate of 65.7% for those aged 15-64 years.

- At the end of June 2020, the COVID-19 Adjusted Measure of Employment, or lower bound of the number of persons aged 15 years and over in employment, is estimated to have been 1,783,567 with an associated COVID-19 Adjusted Employment Rate of 52.2% for those aged 15-64 years.
- By the end of July 2020, this new COVID-19 Adjusted Measure of Employment is currently estimated to have been 1,947,922 with an associated COVID-19 Adjusted Employment Rate of 57.2%.
- Using the standard ILO criteria, the unadjusted number of persons aged 15-74 years who were unemployed in Q2 2020 stood at 118,700 with an associated Unemployment Rate of 5.1% for those aged 15-74 years.
- At the end of June 2020, the COVID-19 Adjusted Measure of Unemployment, or the upper bound of the number of persons aged 15-74 years who were unemployed, was 531,412 with an associated COVID-19 Adjusted Unemployment Rate of 23.1% for those aged 15-74 years.
- By the end of July 2020, the COVID-19 Adjusted Measure of Unemployment is currently estimated to have been 386,935 with an associated COVID-19 Adjusted Unemployment Rate of 16.7%.

Davin Plant Hire Ltd. will employ up to 4 local personnel on an annual basis at this location, both directly and indirectly. Employees include site personnel, administration staff and maintenance personnel, who are based at offsite locations.

Indirect employment is generated, in terms of contract transport drivers, suppliers of products and services, such as fuel and oil suppliers, machinery suppliers, etc.

5.3.5 Tourism and Amenity

According to the Fáilte Ireland preliminary figures for 2016 (the most recent data available in the public domain), County Meath generated €48 million in overseas tourism revenue from a total of 155,000 overseas visitors to the county.

Tourism and recreation are noted as key sectors in both the economic and social development of the County, providing opportunities for employment and wealth generation, and also facilities the infrastructure which ultimately enhance the quality of life for residents. This is reflected within the policy framework of the Meath Local Economic and Community Plan (LECP). The Ancient East, which incorporates County Meath is one of Ireland's long-distance touring route, stretching along the Eastern coast from Cavan to East Cork.

A Tourism Action Plan (2019-2021) has been created by the Tourism Leadership Group and sets out actions required in the period to 2021, to achieve the overall objectives of People Place and

Policy – Growing tourism to 2025.

Meath has much to offer as a tourist destination, in particular its rich heritage, quality rural landscape, attractive towns and villages, and its appealing coastline. Meath has one of Europe's best collections of prehistoric sites and monuments and a unique blend of history and culture. As a result, the county has a large number of visitor attractions, the most famous being the UNESCO World Heritage Site of Brú na Bóinne incorporating the passage tombs at Newgrange, Knowth and Dowth. The Battle of the Boyne site, Trim Castle and the Hill of Tara have also a high profile in both the domestic and overseas markets.

Loughcrew, the Royal site of Tara, Tailteann, the Hill of Ward, Christian sites at Kells, Slane, Donaghmore, Killeen, Dunsany and Duleek, monastic ruins at Bective and Trim, grand country houses from the 18th Century onwards and associated prestigious gardens throughout the county highlight Meath's rich historic past.

The area surrounding the site is not noted as a popular destination for visitors. However, archaeological monuments (enclosures, burial grounds, standing stones, a holy well and some significant megalithic tomb burials) that may attract those with an interest in heritage and local history.

While there are other tourist attractions and local amenities outside the key tourism assets, these are less sensitive to change when compared to the key assets. Outside of significant tourist attractions tourism revenue can be an important source of income to local areas where it is earned, particularly in rural areas. Boycetown Land Reclamation is not located in close proximity to any known tourist attractions and the undulating landscape provides some visual screening for the Planning application area to limit any impact on the landscape.

While there is future potential for development of tourism in rural areas where the proposed development is located, this potential is generally based on further development of existing activities and products, such as walking and cycling. The landscape and land use of an area is an important factor in the development of tourism as it provides a setting for the activities which take place in the area. The proposed restoration may enhance the local amenity in the longer term.

5.3.6 Traffic

This report considered the levels of traffic currently using the local and regional roads, including traffic generated by the proposed development and other nearby haulage operations, established future year traffic growth rates, determined the volume of traffic from the proposed development and quantified the impact of the proposed development on the traffic at this location and in the future. All appropriate guidance documents were consulted in conjunction with this assessment, with traffic flow data in the assessment and the prediction calculations based upon worst case scenario condition.

The report outlined that the traffic generated by the proposed development would equate to 6 HGV arrivals and 6 HGV departures per working day. The operations are proposed to commence in 2021. The report also took into consideration growth factors to calculate future years' traffic which concluded that that these levels of traffic growth will not have a material impact on the operating capacity of the road network. Section 4.4 of the traffic report concluded that the

proposed development will not result in any significant increases on the L6202-3 or the R154 passing through Kiltale Village, the hourly and daily volumes of traffic using the access junctions along the haul route will not result in any capacity issues.

In general, traffic generation does present a health and safety issue to the general public for those use the roads. As noted, a haulage route is currently is use to ensure that no haul traffic enters or departs the site from the west, and that all haul traffic will operate at a maximum speed of 30km/h between the site access and the R154 junction.

5.3.7 Do Nothing

Tourism and amenity development are likely to evolve and develop in line with national trends, the location of visitor attractions and amenities and with local strategies. Doing nothing will have no effect on tourism and recreation in County Meath.

5.4 CONCLUSION

This chapter has examined the prevailing socio-economic environment pertaining to Boycetown Land Reclamation. The population, employment, tourism and amenity context show that there has been and continues to be a need for jobs and investment in the local area but that a development must not harm the local landscape, environment or residential amenities, as specified in the Eastern Regional Planning Guidelines, Meath County Development Plan among other policy documents.

The proposed operations to date have had no direct negative impact on any tourism and amenity sites and have assisted in boosting local employment figures at a time of record unemployment levels while simultaneously aiding the economic recovery of the Eastern region, with wider benefits to the Irish economy in general. It anticipated that this support of the local and regional economy will continue as a result of the proposed works.

No residual impacts are anticipated as the proposed development will be operated in compliance with relevant guidelines.

6 BIODIVERSITY

6.1 INTRODUCTION

This chapter presents an Ecological Impact Assessment (EcIA). It has been prepared to examine possible ecological impacts of the proposed recovery of clean excavation spoil comprising natural materials of clay, silt, sand, gravel or stone for the purposes of land reclamation of the site. Ecological resources/ receptors are evaluated following NRA Guidelines[5], which are consistent with the approach recommended in the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[6].

Boycetown land reclamation is located in a primarily agricultural area within the townlands of Boycetown, Kiltale, County Meath approximately 1 km west of the village of Kiltale, County Meath.

The entrance to the site is located on the eastern boundary of the land reclamation area, on the local road L6202-3. Operational access during land reclamation will be via an existing access track in the south west of the site that opens on the Local road L6202-3.

The field boundaries are comprised of a mixture of hedgerows and fencing. The River Boyne is located 5km to the north of the site. The Boyne and Blackwater (SAC and SPA) is located to the north of the land reclamation area. The location of the site in relation to Designated Sites within 15 km is shown on Figure 5.6 'Designated Sites' and outlined in Table 5-1 below. An Natura Impact Statement has been prepared in relation to this application and is included in Appendix 5.1.

Existing site conditions are presented below, potential effects are assessed, and mitigation measures are recommended, where required. For completeness, habitats/ ecological receptors within the overall landholding are also considered.

6.2 METHODOLOGY

6.2.1 Legislation Policy

Legislation, policy and guidelines relevant to the ecological assessment and referenced herein are as follows:

- Wildlife Act, 1976 and Wildlife (Amendment) Act (2000) including all amendments. In this document, the legislation is referred to collectively as the Wildlife Acts;
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011; hereafter referred to as the Birds and Habitats Regulations);
- EC Birds Directive 2009/147/EEC;
- EC Habitats Directive 92/43/EEC;

[5] NRA (2009). *Guidelines for Assessment of Ecological Impacts of National Road Schemes*. Rev 2.
[6] CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*. Chartered Institute of Ecology and Environmental Management, Winchester

- Convention on the conservation of European wildlife and natural habitats (Bern Convention): Entry into Force in Ireland 01/08/1982;
- (EIA) Regulations, including all amendments 1989-2011;
- Fisheries (Consolidation) Act 1959;
- Flora (Protection) Order, 2015;
- Planning and Development Act (2000) including all amendments;
- Planning and Development (Amendment) Act 2010;
- Wildlife, Habitats & the Extractive Industry: Guidelines for the Protection of Biodiversity within the Extractive Industry[7]: and
- National Biodiversity Plan, 2017-2021.

6.2.2 Desktop Study

The ecological desktop study completed for the proposed project comprised the following elements:

- Review of records of rare and protected flora and fauna including those obtained from the National Parks and Wildlife Service (NPWS) website[8], presented in NPWS reporting, and the National Biodiversity Data Centre (NBDC) website[9];
- Review of Ordnance Survey maps and aerial photography in order to determine broad habitats that occur within the study area;
- Identification of European Sites with links to the proposed development; and
- Review of any other relevant ecological reports and literature (published scientific literature and 'grey' literature).

6.2.3 Field Studies

A walkover survey of the overall landholding was undertaken, with a focus on the ecological receptors within the Planning application area. The survey was undertaken by an experienced ecologist, on the 13th June 2020, 14th November 2020 and August 2021. A brief outline of this walkover survey is included below:

- A habitat survey was undertaken in accordance with The Heritage Council's 'Best Practice Guidance for Habitat Survey and Mapping'[10]. Habitats were classified according to the Heritage Council's 'A Guide to Habitats in Ireland'[11] and following the EU Habitats Interpretation Manual for Annex I Habitats[12]. Searches for evidence of protected flora and/ or presence of suitable supporting habitats were also undertaken.

- A general mammal survey was completed, with specific searches for evidence/ signs of mammals (e.g. tracks, scats, dwellings and/ or direct sightings). An assessment of the habitat in terms of its potential to support mammals was also undertaken.

- An assessment of the freshwater environments on site was undertaken; this included a hand search for macroinvertebrates within freshwater within the red line boundary.

[7] http://www.noticenature.ie/files/Notice%20Nature%20quarry%20brochure%20web_1.pdf
[8] National Parks and Wildlife Service Website: www.npws.ie (accessed June 2016)
[9] National Biodiversity Data Centre Mapping Website: http://maps.biodiversityireland.ie/#/Map (accessed June 2016).
[10] Smith, G.F., O'Donoghue, P., O'Hora, K., Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council, Kilkenny.
[11] Fossitt, J.A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.
[12] EU (2013). Manual of European Union Habitats, EU 28.

- Checks for protected fauna including potential for bat roosts, Common frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) were also conducted.

- A check for Marsh Fritillary was undertaken in September 2020; and assessment was carried out as to the suitability of the restoration area for Devil's-bit Scabious, the food plant of Marsh Fritillary. No suitable area were encountered.

- A bird survey was conducted following the Countryside Bird Surveys (CBS) line transect methodology. While all birds were recorded, the focus was to determine species of conservation concern including species listed on Annex 1 of the EU Birds Directive; and Red and Amber listed species of High and Moderate conservation concern respectively (Bird Watch Ireland Conservation evaluation criteria).

6.2.4 Baseline Evaluation of Ecological Receptors

Ecological resources/ receptors are evaluated following NRA Guidelines[13], which are consistent with the approach recommended in the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018)[14].

6.3 RECEIVING ENVIRONMENT

6.3.1 Site Description

Boycetown land reclamation is located in a primarily agricultural area within the townlands of Boycetown, Kiltale, County Meath approximately 1 km west of the village of Kiltale, County Meath. The location of the site in relation to its geographic surrounds is shown on Figure 1.1 'Regional Site Location Map'. The overall landholding is approximately 5 ha with the area of proposed restoration using inert excavation material (i.e. area within planning boundary) totalling approximately 5.6ha (5 ha including the access road).

The entrance to the site is located on the eastern boundary of the land reclamation area, on the local road L6202-3. Operational access during restoration will be via an existing access track in the south west of the site that opens on the Local road L6202-3.
.

The field boundaries are comprised of a mixture of hedgerows and fencing.

The site drainage is connected to the River Boycetown, part of the River Boyne catchment. The River Boyne is located 5.2km to the north of the site. The Boyne and Blackwater (SAC and SPA) is located to the north of the land reclamation area. The location of the site in relation to Designated Sites within 15 km is shown on Figure 5.1 'Designated Sites' and outlined in Table 5-1 below. An Natura Impact Statement has been prepared in relation to this application and is included in Appendix 5.1.

[13] NRA (2009). *Guidelines for Assessment of Ecological Impacts of National Road Schemes*. Rev 2.
[14] CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*. Chartered Institute of Ecology and Environmental Management, Winchester

The following Natura 2000 Sites were considered as relevant for consideration as they are very close and possibly linked by impacts associated with the proposed development, refer to Table 1:

Table 6-1 European sites in relation to the proposed development

Site Name and designation	Qualifying Interests (QI)	Distance (m) to European Site
River Boyne and Blackwater SAC (Site Code 002299	Annex I habitats for which the SAC has been selected at favourable conservation status: Alkaline fens; Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae). To maintain the Annex II species for which the SAC has been selected at favourable. conservation status: *Lampetra fluviatilis, Salmo salar, Lutra lutra.*	5.2km
River Boyne and Blackwater SPA (Site Code 004232).	*Alcedo atthis* [breeding Kingfisher]	5.2km
Mount Hevey Bog (Site Code 002342)	Raised Bog	20 km
Royal Canal pNHA	Canal	10km
Molerick Bog NHA	Raised Bog	10km
Ballina Bog	Raised Bog	12 km

- NHA = Natural Heritage Area (Nationally Designated Site),
- pNHA = proposed Natural Heritage Area (not currently designated but recognised in County Development Plans);
- SAC = Special Area of Conservation (European Designated Site).
- SPA = Special Protection Area (European Designated Site).

6.3.2 Habitats

Habitats were classified in accordance with Fossitt (2000). Eight habitat classes and habitat mosaics (habitat consists of a mix of habitat classes) were determined within the overall landholding including;

- Building and Artificial Surfaces (BL3);
- Improved agricultural grassland (GA1);
- Wet grassland (GA4);
- Depositing lowland rivers (FW4);
- Treelines (WL2); and
- Hedgerows (WL1).

Habitats classes and their extents are presented in Figure 5.2 and described below.

The dominant habitat feature within the application site is the agricultural land (Grassland) itself. Other habitats represented include treelines, grassland, wet grassland. These are dealt with in more detail below in accordance with their Level 3 Fossit Classification.

HEDGEROWS / TREELINES (WL1 / WL2)

The dominant species within these linear features include hawthorn (Crataegus monogyna) and blackthorn (Prunus spinosa), whilst elder (Sambucus nigra), ash (Fraxinus excelsior) and sycamore are also common. The understorey is dominated by bare ground, nettles (Urtica dioica) and bramble (Rubus fruticosus). The hedgerows are predominantly on the site boundaries with internal unmanaged treelines to the centre of the site.

Evaluation: These overgrown treelines and hedgerows while they have poor structure, contain semi-natural habitat types with moderate biodiversity in a local context and a degree of naturalness. The boundary hedgerows are evaluated as being of Local Importance (Higher value). Internal treelines in the infill area are classified as Local Importance (Lower value)

Photo 1 – Access track - Treeline with nettle and bramble understory to the left of access track. Field is GA1. Looking west to deposition site.

Improved Grassland (GA1)
This habitat is principally dominated by Perennial rye grass (Lolium perenne) and is species poor. Agricultural herb species are common namely, Creeping buttercup (Ranunculus repens) and Dandelion (Taraxcum officinale), with Nettles (Urtica dioica), docks (Rumex sp.) and umbeliferae species including cow parsley more frequent at field edges.

Evaluation: These species poor habitat types with low biodiversity and are evaluated as being of Local Importance (Low value).

Wet Grassland (GS4)
This grassland habitat is poorly drained with a number of shallow cross drains throughout the site. The area is managed for cattle grazing.
They have been subject to some land improvements and general low/moderate levels of fertiliser input.
Species composition is dominated by abundant rushes, mainly Soft rush (Juncus effusus), and broadleaved herbs such as Broad leaved plantain (Plantago major), Creeping buttercup, ragwort (Senecio jacobaea), Selfheal (Prunella vulgaris), Compact rush (Juncus conglomeratus, Daisy (Bellis perennis). and occasional Meadowsweet (Filipendula ulmaria). This habitat type is fertilised with a low mowing or grazing regime. It represents the majority of grassland habitats remaining within the application site. Tussocky grasses are the dominant feature and species such as cocksfoot and Yorkshire fog are dominant. Herbaceous species recorded included nettles Urtica dioica, meadow buttercup Ranunculus acris, germander speedwell Veronica chamaedrys, vetches Vicia sp. and ribwort plantain Plantago lanceolata.

Evaluation: This habitat is well represented in the locality and it is of medium biodiversity value. It provides a good source of nectar for pollinating insects.

Photo 2 – Wet grassland/Improved Grassland – infill area

Depositing Lowland rivers (FW2)
A tributary/drainage channel is located on both the eastern boundary of the landholding. The drain is poorly oxygenated, slow flowing, and heavily silted with some glide sections.

This is not suitable spawning or juvenile salmon habitat. No suitable spawning habitat or streams exist on the site.

The drainage banks and relatively straight section are evidence of previous OPW arterial drainage in the area. A number of cattle access points has resulted in localised siltation of the drains. Significant macrophytes growth, was noted. An inspection of macrophytes upstream and downstream of the land reclamation area including Duckweed (Lemna Spp) and Bulrush (Typha latifolia).

The river contains semi-natural habitat types with a low degree of naturalness. The drain is evaluated as being of Local Importance.

Photo 3 Drainage ditch at fording/cattle access point/

RARE AND PROTECTED PLANT SPECIES

An examination of the website of the National Biodiversity Data Centre revealed that there are no records for the presence of any protected plant species from within the relevant 1km grid squares (N8653 and N8652) of the proposed development.

MAMMALS

Common mammal species noted included rabbit (Oryctolagus cuniculus) and fox (Vulpes vulpes). The Irish hare Lepus (timidus hibernicus) has also previously been recorded from the locality. Both these species are protected under the Irish Wildlife Acts. In addition, given the habitats and designations close to the site it is also likely that the otter Lutra lutra occurs locally however no evidence was noted on the site. This species is listed in Annex II of the EU Habitats Directive.

INVERTEBRATES, AMPHIBIANS, REPTILES

A number of invertebrates were observed on site including butterflies (the speckled brown, red admiral and tortoiseshell). Neither frogs nor newts were observed in adult or tadpole stage, however it is likely that some of these ponds may provide a suitable breeding habitat for these species. In addition, the site would provide also suitable basking habitats for the viviparous lizard. Frogs, newts and lizards are all protected species under the Irish Wildlife Acts.

FISHERIES

The adjacent stream/drainage channel is heavily silted and stagnant in the summer of 2020 and 2021. No suitable habitat was noted for salmonids. Information on the fisheries of the River

Boycetown was obtained from the Inland Fisheries Ireland Water Framework Directive (WFD) mapping application. This interactive facility highlights the location of the WFD monitoring sites for fish in Ireland. Species present in the Boyne at this site include brown trout, European eel, lamprey spp, minnow and stone loach.

Figure 6-1: Designated Conservation Areas

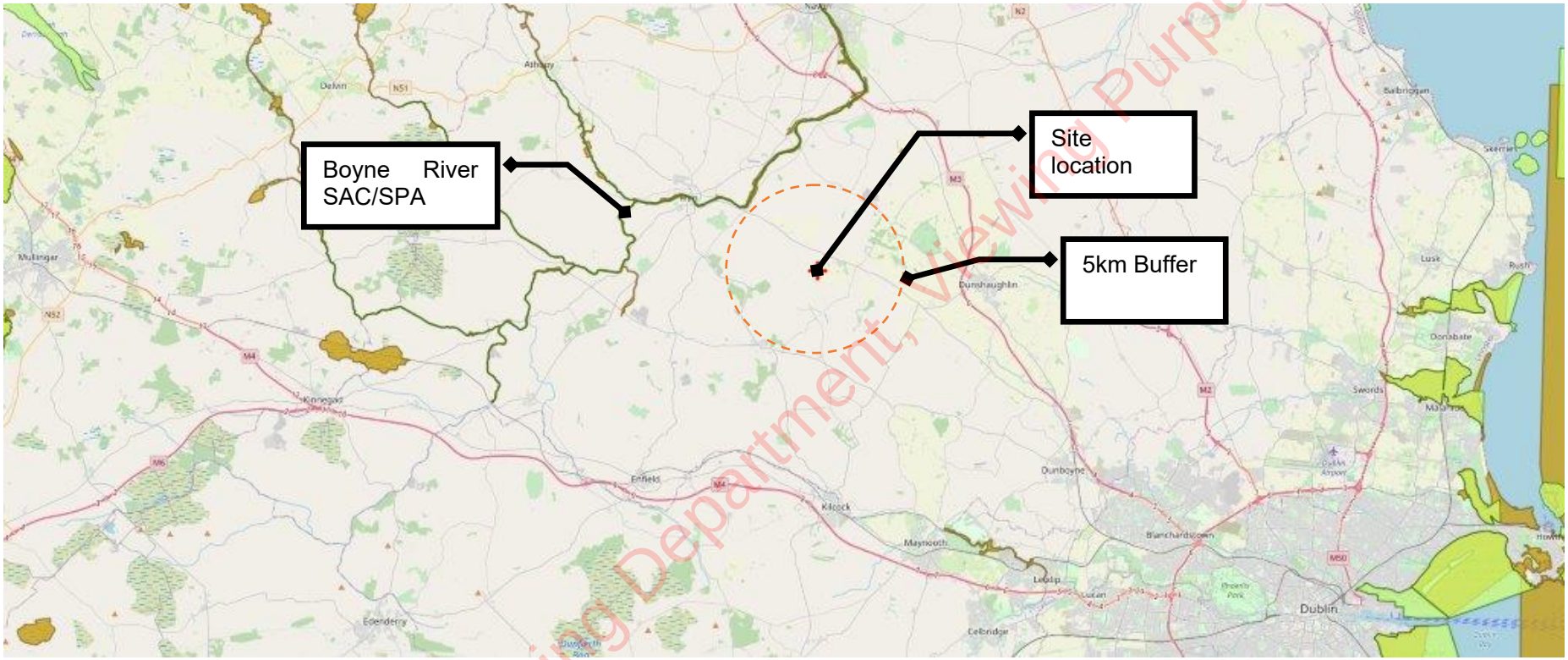


Figure 6-2: Habitats Map

6.3.3 Invasive and Non-native Flora

No invasive species were recorded on the landholding during the field visit.

Sycamore (Acer pseudoplatanus) was recorded within hedgerows and treelines to the north of the site. This species is listed on Invasive Species Ireland's "Amber" risk list[15] which does not pose a high risk to native species or habitats. No other invasive species were noted on site during the site visit.

A search of the National Biodiversity Data Centre database revealed nineteen invasive species that have been recorded within the 10 km square (R64) in which the proposed development is located, of these only two high impact species, on Third Schedule of the 2011 Habitat Regulations, were listed. These species are outlined in Table 5-1 below.

Table 6-2: Invasive Species recorded within the 10 km Grid Square n85

Scientific name	Common name	Title of dataset	Designation	Listed on Third Schedule of the 2011 Habitat Regulations
Elodea canadensis	Canadian Waterweed	National Invasive Species Database	Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)	Yes

No evidence of any high Impact species was noted on site. For the purpose of managing invasive species during construction works, only species listed as invasive species on the Third Schedule of the 2011 Habitat Regulations[16] are of concern. It is an offence to plant, disperse, allow or cause to disperse, grow any plant listed in Part 1 of the Third Schedule of the Regulations.

6.3.4 Protected Fauna

A search of the National Biodiversity Data Centre database and NPWS database identified records of protected fauna within the 1 km (R6947 and 6948) and 10 km (N85) squares within which the proposed development is located[17]. The potential exists for these species to occur where suitable habitat exists within the proposed development site. It is noted that all species of birds are protected under the Wildlife Act 1979 (Amendment 2000), therefore individual species are not listed.

[15] http://invasivespeciesireland.com/toolkit/risk-assessment/amber-list-recorded-species/ (Accessed September 2016).
[16] http://www.irishstatutebook.ie/eli/2011/si/477/made/en/print (accessed February 2016).

Table 6-3: Protected Fauna

Latin Name	Common Name	Protected Status	Source NBDC[17], 8
Amphibian			
Rana temporaria	Common Frog	Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts	National Frog Survey of Ireland 2010/2011
Crustacean			
Austropotamobius pallipes	Freshwater White-clawed Crayfish	Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts	Irish National Crayfish Database
Terrestrial Mammals			
Erinaceus europaeus	West European Hedgehog	Protected Species: Wildlife Acts	Atlas of Mammals in Ireland 2010-2015, NPWS website
Lutra lutra	European Otter	Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	MISE Project Otter Records, 2011-2015
Martes martes	Pine Marten	Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
Meles meles	Eurasian Badger	Protected Species: Wildlife Acts	Atlas of Mammals in Ireland 2010-2015
Myotis daubentonii	Daubenton's Bat	Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
Nyctalus leisleri	Lesser Noctule	Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
Pipistrellus pipistrellus sensu lato	Common Pipistrelle	Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
Pipistrellus pygmaeus	Soprano Pipistrelle	Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
Plecotus auritus	Brown Long-eared Bat	Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts	National Bat Database of Ireland
Rhinolophus hipposideros	Lesser Horseshoe Bat	Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species:	National Lesser Horseshoe Bat Database

[17] National Biodiversity Data Centre Mapping Website: http://maps.biodiversityireland.ie/#/Map (accessed March 2017).

Latin Name	Common Name	Protected Status	Source NBDC[17], 8
		Wildlife Acts	
Sciurus vulgaris	Eurasian Red Squirrel	Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
Sorex minutus	Eurasian Pygmy Shrew	Protected Species: Wildlife Acts	Atlas of Mammals in Ireland 2010-2015

Fox (*Vulpes vulpes*) and Hare (*Lepus timidus hibernicus*) was evident on site. No other evidence of mammals was recorded during the surveys. Given the environment and habitats present, other mammals that likely use the land reclamation area, at least for foraging purposes, include;

- Rodents;
- Rabbits (Oryctolagus cuniculus)
- Bat species (foraging);
- Hedgehogs (*Erinaceus europaeus*);
- Stoats (*Mustela erminea*);

Treelines and hedgerows within and surrounding the site are likely to be used as foraging corridors by commuting and foraging bats. No mature trees were recorded within the site as having potential for to be used as bat roosts.

Bird species recorded onsite included:

- Woodpigeon (Columba palumbus),
- Common Raven *(Corus corax*).
- Chaffinch (Fringilla coelebs)
- Robin (*Erithacus rubecula*),
- Wren (*Troglodytes troglodytes*),
- Blackbird (*Turdus merula*),
- Blue Tit Parus caeruleus
- Pied Wagtail (*Motacilla alba*),
- Song thrush (*Turdus philomelos*) and
- Starling (Sturnus vulgaris)

Of these, none are of conservation concern (red listed species on Birds of conservation concern in Ireland 2014-2019[18]).

Overall, based on the extent of the site and the presence of habitats to support avifauna, the bird populations present are evaluated as being of local importance (lower value).

6.3.5 Off Site relevant Ecological Receptors

A list of the relevant Designated Sites is included Table 5-1 above. An Natura Impact Statement was produced in relation to the proposed development (Appendix 5.1). It is concluded that there are no likely potential effects, whether direct, indirect or cumulative/in-combination, which could give rise to adverse effects on the qualifying interests or the conservation objectives of any designated Natura 2000 site. It can be concluded that it is unlikely that the proposed

[18] http://www.birdwatchireland.ie/LinkClick.aspx?fileticket=VcYOTGOjNbA%3d&tabid=178

development will result in significant effects to any European Site, in view of their conservation objectives of the habitats or species for which it was designated, either alone or in combination with other plans or projects.

6.3.6 Ecological Evaluation

Key Ecological Receptors within the Restoration Area

There are no key ecological receptors within the red line boundary. The area is predominately GA1 on the land reclamation area, with wet grassland also present.

Key Ecological Receptors within the Overall Landholding

The key ecological receptors noted within the overall landholding of Boycetown land reclamation, outside of the restoration area are;

- Boundary watercourses – outside the development boundary;
- Treelines and hedgerows; and

Lowland rivers are a key ecological receptor that forms the western boundary of the landholding. Lowland rivers provide habitats for freshwater macrophytes, fish and macroinvertebrates. The Boyne and Blackwater SAC is an Internationally Important habitat. These areas will be undisturbed by the proposed development.

Hedgerows and treelines are robust semi-natural habitats. They are significant habitats for wildlife on the site forming ecological corridors connecting the site and surrounding area. The hedgerows and treelines present at Boycetown land reclamation are considered a key ecological receptor of Local Importance (Moderate to Higher Value). The southern hedgerow will be undisturbed by the proposed development. The eastern hedgerow will be realigned to address road safety.

The proposed settlement pond in the west of the site is proposed to develop as a significant aquatic and fringing wetland habitat, as a result of reinstatement activities. This area will remain undisturbed.

Designated Conservation Areas

The landholding including the proposed restoration area does not lie within or is adjacent to any site designated for nature conservation. A key source-pathway-receptor is surface water quality downstream of the land reclamation area to the Boyne and Blackwater SAC. Based on this study no significant impacts are likely as a result of the proposed development.

No direct or indirect impacts are likely to any site designated for conservation purposes. No other plant or habitat key ecological receptors were determined within the site boundary.

In general, the habitats and common wildlife present at Boycetown land reclamation are typical of agricultural land. The most significant habitats (Key ecological receptors) will be undisturbed by the proposed development and will be retained. Key ecological receptors are considered below under “impacts from proposed works”.

Key Ecological Receptors (on site)

No impacts will occur to key ecological receptors as a result of the proposed development.

Key Ecological Receptors (off site) - Surface Water Quality

The only site relevant is the Boyne and Blackwater SAC which will not affected, refer to designated sites above.

Based on the desk and field study findings it is determined that:

- No significant aquatic habitats occur on site and in the immediate local area; and
- No significant water quality issues arose associated with the activities in the Planning application area of Boycetown land reclamation.

6.4 POTENTIAL EFFECTS

The key ecological receptors on the site (described habitats) are recognised by the operator (Davin Plant Hire Ltd) and protected.

The management of Boycetown land reclamation will ensures retention of key ecological receptors within the landholding and allows protection of downstream water quality as evidenced from surveys implemented.

There is a potential to accidently introduce invasive species to the site. The main invasive species are Japanese knotweed and giant hogweed. Comprehensive mitigation measures will be implemented to reduce and address any invasive species if they issue.

No significant adverse ecological impacts are evident from works to date within the Waste Permit Facility Application Area of Boycetown land reclamation and it is not anticipated that there will be any adverse impacts from the proposed land reclamation.

6.4.1 Impact Assessment Criteria

The assessment of potential effects on flora and fauna is based on standard good practice including EPA[19], CIEEM[14] and NRA series of guidelines[20], as outlined below.

[19] EPA (2002). *Guidelines on the information to be contained in Environmental Impact Statements.* Johnstown Castle Estate, Wexford.
[20] NRA website: http://www.tii.ie/technical-services/environment/planning/

Table 6-4: Criteria used in Ecological Impact Assessment (EPA, 2002, IEEM 2006)

Positive or Negative: Is the impact likely to be positive or negative? International and national policy now pushes for projects to deliver positive outcomes for biodiversity.
Context (Magnitude and extent): A scheme may effect only a small part of a site but the area of habitat affected in that location (in hectares) should be given in the context of the total area of such habitat available (e.g. 1 ha of a woodland which measures 30ha in total.)
Character: The type of habitat (e.g. natural or highly modified woodland; mature or recently established, wet or dry) is important, as is the quality of the site (e.g. undamaged active blanket bog).
Significance: State whether a site has a designation, such as a SAC or NHA, or contains a listed (Annex I) habitat. The ecological value of a site can be assigned a rating using an evaluation scheme (e.g. undesignated areas of semi - natural broadleaved woodland are normally rated as high value, locally important).
Sensitivity: Indicate changes that would significantly alter the character of an aspect of the environment (e.g. changes in hydrology of a wetland due to construction of access road).
Duration: Indicate the time for which the impact is expected to last prior to recovery or reinstatement of impacted habitats and/or species. The duration of an activity may differ from the duration of the resulting impact caused by the activity (e.g. short-term construction activities may cause disturbance to birds during the breeding season, however, there may be longer – term impacts due to a failure to reproduce in the disturbed area during that season).
Reversibility: Identify whether an ecological impact is permanent (non-reversible) or temporary (reversible – with or without mitigation).
Timing and Frequency: Some changes may only cause an impact if they happened to coincide with critical life-stages or seasons (for example, the bird nesting season). This may be avoided by careful scheduling of the relevant activities.

6.4.2 Potential effects during Construction Phase

The proposed restoration area is not located within any designated conservation site (SAC or SPA) and there are no potential direct impacts identified. No works are proposed within a NHA, SAC or SPA.

The potential for indirect or cumulative impacts are assessed as being unlikely and not significant, taking account of the absence for pathways for significant adverse effects, as set out in greater detail in the NIS.

Construction stage impacts will involve the transport of material through the site, from the entrance in the southeast of the agricultural land and the deposition of material within the proposed land reclamation area. The potential for significant impacts as a result of the temporary disturbance is evaluated as being low and moderate in the local context.

The material will be placed in a passed basis, with the ground level will then be gently sloped towards the to the east of the proposed restoration area. The potential for significant impacts as

a result of the temporary loss of current habitats in that area is evaluated as being minor, temporary and negative in the local context.

No hedgerows, evaluated as being of local importance (higher value) will be lost as a result of this proposed development, as access routes will use existing access roads through the site, avoiding the requirement to break new entrances. A low value hedge/treeline (<50m) will be removed to accommodate the development. A new hedgerow will be planted along the post and wire fence and along the drainage ditch to the east with gap planting proposed for the existing hedgerows.

There are no instream works proposed within watercourses. However, the proposed construction works give rise to the potential for increased mobilisation of silt and suspended solids via surface water run-off. Surface water protective measures (including those stipulated in Section 8 - Hydrology) will be designed for the site prior to the commencement of works. The potential for significant impacts affecting water quality and aquatic ecological receptors are therefore evaluated as being low and imperceptible in the local context.

There is no amber listed bird of conservation concern, no rare or protected birds were recorded from within the proposed development site. The majority of species recorded were common in the Irish countryside. No direct disturbance will occur as a result of the restoration. Regardless, mitigation is proposed to avoid the disturbance of breeding bird habitat during the nesting season. It is evaluated that the potential effects affecting birds are imperceptible and limited to the local context.

No potential bat roosts were recorded onsite. Bat species use treelines as commuting corridors. No treelines will be lost due to the proposed development. The potential for impacts affecting bats are evaluated as being imperceptible in the local context.

6.4.3 Potential effects during the Operational Phase

Following the deposition of the stone and soil material the area will be top soiled and seeded with grass. No significant operational phase impacts are therefore applicable.

6.5 MITIGATION MEASURES

6.5.1 Habitats and Flora

Following the ecological walkover, the Land reclamation plan was amended to ensure that key ecological receptor habitats (trees, treelines, hedgerows,) along the boundary will be avoided by the footprint of the proposed development and be maintained *in-situ*.

During construction, a buffer will be implemented along the drainage ditch. The buffer will ensure sediment is not released to the drain. In order to reduce siltation of the drain, the drain will be fenced to limit access to the drain. A berm will be constructed to prevent direct runoff to the drain. Water will pass through a settlement pond.

Surface water protective measures (including those stipulated in Section 6 - Hydrogeology) will be adhered to for the duration of the works.

A hedgerow will be gap planted along the screening to the east of the site. In addition, a berm will be located along the eastern boundary during the construction phase to prevent direct runoff into the drainage ditch. No invasive species were found within the footprint of the activity area of the

proposed development or along the access tracks. Any invasive species identified within the overall landholding will be fenced off and will remain undisturbed, as per best practice. Nature conservation areas - Invasive plant species pose a threat to our native species. If identified on site, Davin Plant Hire Ltd will consult with the relevant authorities before undertaking any action.

Preventing an invasive plant species from arriving on site or preventing the spread of an invasive plant species are the most effective management measures that can be taken. Prevention measures range from raising staff awareness, to ensuring that good site hygiene practices are employed for the movement of materials into the site. Prevention measures include:

- Specifying that all imported soil and topsoil must be free of the seeds and rhizomes of key invasive plant species;
- Regular walkovers by staff;
- Cordoning off the invasive species;
- Limiting movement of people and / or machinery if identified on site;
- Designating staff and machinery to the task for the duration of the works; and
- Ensuring anyone undertaking control measures is suitably qualified.

An invasive species management plan will be developed for the site. Containment: If identified on your site, you should aim to contain its spread in the first instance. This is usually done by cordoning off stands of the plants (including the relevant buffer zones) to stop people and machinery entering these areas. The measures used for containment are very similar to the measures used in prevention.

Treatment and eradication: There are many effective ways of treating and/or eradicating invasive plant species, including chemical treatment, removal by hand/ or machinery. Treatment and eradication would be undertaken by suitably qualified personnel.

6.5.2 Protected Fauna

Birds

Breeding bird habitats (e.g. hedgerows, treelines) will not be removed, cleared or trimmed between the 1st March and 31st August, to avoid impacts on nesting birds which are protected under the Irish Wildlife Acts.

If any protected species or their resting places (e.g. bat roosts or badger setts) are discovered within the site boundary during works, works within the area must be suspended and a qualified ecologist contacted immediately to liaise with the NPWS and potential requirements for derogation licences to avoid contravention of legislation which protects such species and their dwellings.

Due to the potential for a lengthy time span to elapse between planning (if consented) and commencement of works, a pre-construction survey is recommended prior to the commencement of construction works. This is of importance with reference to badger and bat species which may have developed dwellings or roosts within the proposed development site during the intervening period. All site visits will also provide baseline information for the monitoring of the site following the implementation of the Land reclamation plan.

Bats

The day time bat survey on site did not record any potential bat tree roosts; furthermore, no trees of moderate to high bat potential were recorded on-site.

Conclusion

Ecological desk and field studies were undertaken for the proposed land reclamation at Boycetown land reclamation. Potential effects are of low magnitude in the temporary to short-term and therefore insignificant.

7 SOILS AND GEOLOGY

7.1 INTRODUCTION

This chapter aims to assess the potential impact of the proposed works within the area of Boycetown land reclamation identified as the Planning Application Area and as described in Chapter 2. This Chapter includes an assessment of any potential impact on the geological environment (soils, subsoils, bedrock) at and surrounding Boycetown land reclamation, as a result of the proposed material importation activities at this location.

Article 27 material (greenfield material topso
il and soil) will be used on the access road, Berms and to topsoil the site.

7.2 METHODOLOGY

This chapter has been prepared having regard to the following guidelines and policy:

- Geology in Environmental Impact Statements – a Guide (Institute of Geologists of Ireland (IGI) 2002);
- Groundwater Directives (80/68/EEC) and (2006/118/EC);
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA 2008a);
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2008b);
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);

7.2.1 Consultation

As part of the study, the following parties were consulted:

- Landowner/Davin Plant Hire Ltd for details of existing ground investigation data;
- Geological Survey of Ireland for details on background mapping and geological heritage.

7.2.2 Desk study

A desk study was undertaken in order to collate and review background information in advance of the site survey. The desk study involved the following:

- Examination of the Geological Survey of Ireland (GSI) datasets pertaining to geological and extractive industry data and the GSI borehole database;
- Examination of Environmental Protection Agency (EPA) data including soil and subsoils;
- Examination of National Parks and Wildlife Service (NPWS) nature conservation designations; and
- Preparation of site maps and suitable field sheets for the site survey

The desk study information obtained is referenced below. Following the desktop study and the site survey, geological maps were generated in GIS and are included below. As part of the study, the following public information sources were reviewed:

- Published geological, soil, groundwater, surface water, aquifer, recharge data obtained from the Geological Survey of Ireland (GSI);
- National Parks and Wildlife Service data of designated conservation areas;

- Waste and IPPC licensed facility data from EPA Geoportal;
- Irish Geological heritage site map from the GSI (www.gsi.ie);
- EPA online Envision Map Viewer (www.epa.ie);
- Aerial Photography from ESRI (ArcGIS).

The Environmental Protection Agency (EPA) recently published its 'Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, August 2017), which are intended to guide practitioners preparing an EIAR during the transition to new Regulations transposing the revised EIA Directive.

In preparing this EIAR regard has also been taken of the provisions of 'Advice Notes on Current Practice in the Preparation of EIS' (EPA, 2003) and the 'Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment', published by the Department of the Environment, Community and Local Government (DECLG) in March 2013 to the extent these guidelines are relevant having regard to the enactment of the revised EIA Directive.

Criteria for evaluating impact level are shown in Table 7-1. Terminology for impact significance and duration follows that set in the EPA's Guidelines (2002 and 2017).

Table 7-1: Significance of effects

Magnitude	Examples
Very High	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource Groundwater which supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
High	Contaminated soil on-site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Moderately sized existing quarry or pit Regionally Important Aquifer with multiple wellfields Groundwater which supports river, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2,500 homes Inner source protection area for regionally important water source
Moderate	Contaminated soil on-site with previous light industrial usage Small recent landfill site for mixed wastes Small existing quarry or pit Sub-economic extractable mineral resource Regionally Important Aquifer Groundwater which provides large proportion of baseflow to local rivers Locally important potable water source supplying >1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source Locally Important Aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Large historical and/or recent site for construction and demolition wastes Small historical and/or recent landfill site for construction and demolition wastes

The magnitude of any effects considers the likely scale of the predicted change to the baseline conditions resulting from the predicted effect and considers the duration of the effect i.e. temporary or permanent. Definitions of the magnitude of any effects are provided in Table 7-2.

Table 7-2 : Magnitude of effects

Magnitude	Criteria	Examples
Very High/High adverse	An impact, which obliterates sensitive characteristics of the soil or geology environment	Loss of high proportion of future quarry or pit reserves Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Removal of large proportion of aquifer Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems Potential high risk of pollution to groundwater from routine run-off[1] Calculated risk of serious pollution incident >2% annually[2]
Moderate adverse	Fundamental change to ground conditions, groundwater quality or flow regime	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Requirement to excavate / remediate significant proportion of waste site Removal of moderate proportion of aquifer Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems Potential medium risk of pollution to groundwater from routine run-off[1] Calculated risk of serious pollution incident >1% annually[2]
Low adverse	Measurable change to ground conditions, groundwater quality or flow regime	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Removal of small proportion of aquifer Changes to aquifer or unsaturated zone resulting in slight change to water supply springs and wells, river baseflow or ecosystems Potential low risk of pollution to groundwater from routine run-off[1] Calculated risk of serious pollution incident >0.5% annually[2]
Negligible	No measurable effects on ground conditions, groundwater quality or flow	No measurable changes in attributes
Low Beneficial	Minor change to ground conditions, groundwater quality or flow regime	Slight enhancement of geological heritage feature.
Moderate Beneficial	Measurable change to ground conditions, groundwater quality or flow regime	Moderate enhancement of geological heritage feature
High Beneficial	Fundamental change to ground conditions, groundwater quality or flow regime	Major enhancement of geological heritage feature

Source: Based on NRAs Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes

Impact ratings may have negative, neutral or positive application where:

- Positive impact – A change which improves the quality of the environment;

- Neutral impact – A change which does not affect the quality of the environment; and
- Negative impact – A change which reduces the quality of the environment.

Terms relating to the duration of effects are as described in the EPA's *Guidelines on the Information to be contained in Environmental Impact Statements* (March 2002) as:

- Temporary Impact - lasting one year or less;
- Short term Impact - lasting one to seven years;
- Medium term Impact - lasting seven to fifteen years;
- Long term Impact - lasting fifteen to sixty years; and
- Permanent Impact - lasting over sixty years.

A qualitative approach was used in the evaluation generally, following the significance classification in Table 7-3 and through professional judgement. The significance of a predicted impact is based on a combination of the sensitivity or importance of the attribute and the predicted magnitude of any effect. Effects are identified as beneficial, adverse or negligible, temporary or permanent and their significance as major, moderate, slight or not significant (negligible).

Table 7-3: Effects Matrix

Sensitivity	Magnitude			
	Very High	**High**	**Medium**	Low
Very High	Profound	Profound	Moderate	Low
High	Profound	Moderate	Moderate/Low	Moderate/Slight
Medium	Moderate	Moderate/Low	Moderate/Slight	Slight
Low	Moderate/Low	Slight	Slight	Negligible
Negligible	Slight	Slight	Negligible	Negligible

In order for a potential impact to be realised, three factors must be present. There must be a source or a potential effect, a receptor which can be adversely affected and, a pathway or connection which allows the source to impact the receptor. Only when all three factors are present can an effect be realised.

7.3 RECEIVING ENVIRONMENT

7.3.1 Topography

The topography of the application area varies from approximately 71 mOD at the lowest level of the worked area to approximately 75 mOD at the highest point. Land rises to 80 mOD further to the west and south of the site.

7.3.2 Soils

The soil classification for the area is shown in Figure 6.1. Reference to the GSI Soils Map for this area indicates that the dominant soil type within Boycetown land reclamation is described as Lacustrine soils and includes the gley soil groups. Till soils surround the lacustrine soils. The

soils on site are a surface water/groundwater gley with a shallow water table (0.3 to 0.5m Below Ground Level). The site is mainly poorly drained.

The site is located in the GSI Domain 2 in terms of geochemical properties for soil recovery facilities. .

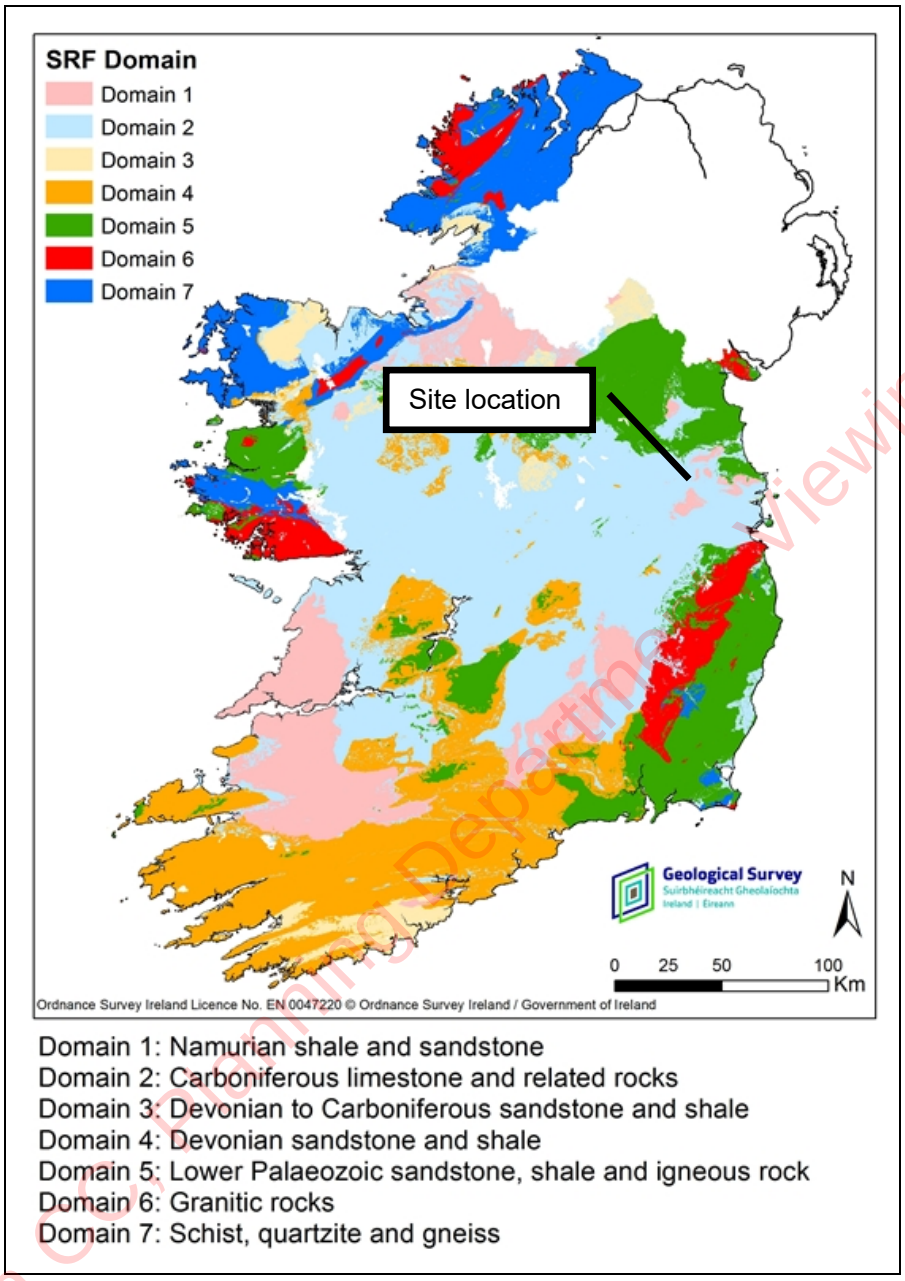


Figure 7-1 SRF Domain areas

Generic maximum concentrations and/or soil trigger levels that should be used for acceptance at authorised soil recovery facilities for the following parameters: • Metals in soil and stone (including As, Cd, Cr, Cu, Hg, Ni, Pb, Zn); • Total organic carbon in soil and stone; • Total BTEX (benzene, toluene, ethylbenzene, xylenes) in soil and stone; • Mineral oil in soil and stone; • Polycyclic aromatic hydrocarbons (PAHs) in soil and stone; • Polychlorinated Biphenyls (PCBs) in soil and stone; • Asbestos fibres in soil and stone. An material brought under the article 27 including greenfield topsoil will be compliant the stardards set out in the SRF guidance.

7.3.3 Subsoil Geology

The Quaternary Period is the most recent period of geological time, generally taken to cover the last 1.65 million years. It is subdivided into two epochs which are the Pleistocene (1.65 million to 10,000 years ago) and the Holocene (10,000 years ago to the present). The Holocene, in Ireland, is the postglacial period. Most of the subsoil sediments in Ireland were deposited during the last 130,000 years.

Ireland was covered by ice for long periods in the last 130,000 years, just as many high latitude regions are nowadays. The last glaciation occurred between 63,000 years ago and 10,000 years ago and had a huge influence on both the landscape and the underlying geology of the country. In the last 10,000 years ago, the action of modern rivers (including the River Boyne) and the infilling of lakes, along with the formation of peat bogs, have been the main natural processes affecting both our landscape and geology.

The subsoil classification is described by the Geological Survey of Ireland (GSI) subsoil map (www.GSI.ie) as Lacustrine Soils. This area of Lacustrine soils (Lac) are also located along the course of the tributary to the River Boycetown. The lacustrine deposits are bedded, consisting of many complex strata of silts and clay material left both by the flooding of rivers over their floodplains and the meandering of rivers across their valleys.

Additional subsoil types within an approximate 1km radius of Boycetown land reclamation is described as Sand and gravel deposits and Till chiefly derived from Limestones (TLs) to the west, north and south of the land reclamation area and sand and gravels derived from limestones to the east.

Site observations indicates the sandy SILT and slightly gravelly SILT with an increase in clay/silt content to the south and east of the site along the tributary.

7.3.4 Bedrock Geology

The Bedrock Geology for this area is included in Figure 7.3 below. Reference to the relevant geological information, the 1:100,000 scale Sheet No. 16 – Geology of Meath (Geological Survey of Ireland (GSI), 1999) and the GSI bedrock data (www.GSI.ie), indicates that the Boycetown land reclamation site is underlying by Carboniferous era, Dark limestone & shale (`Calp').

These are basinal sediments consisting of dark grey, fine grained, graded limestones (bioclastic calcarenites), interbedded with black calcareous mudstones and shales. The thickness of the limestone beds, grain size, colour and the proportion of shale vary widely. Towards the top of the Calp the basinal limestones are often interbedded with shallower water oolites or graded crinoidal calcarenites and calcirudites of turbiditic origin, which become more frequent towards the basin margins. Occasional thin sandy limestones can also be encountered. Lateral variations occur within the Calp Limestone between basin-edge successions and its finer-grained basin-centre equivalents.

Figure 7-2: Subsoils Map

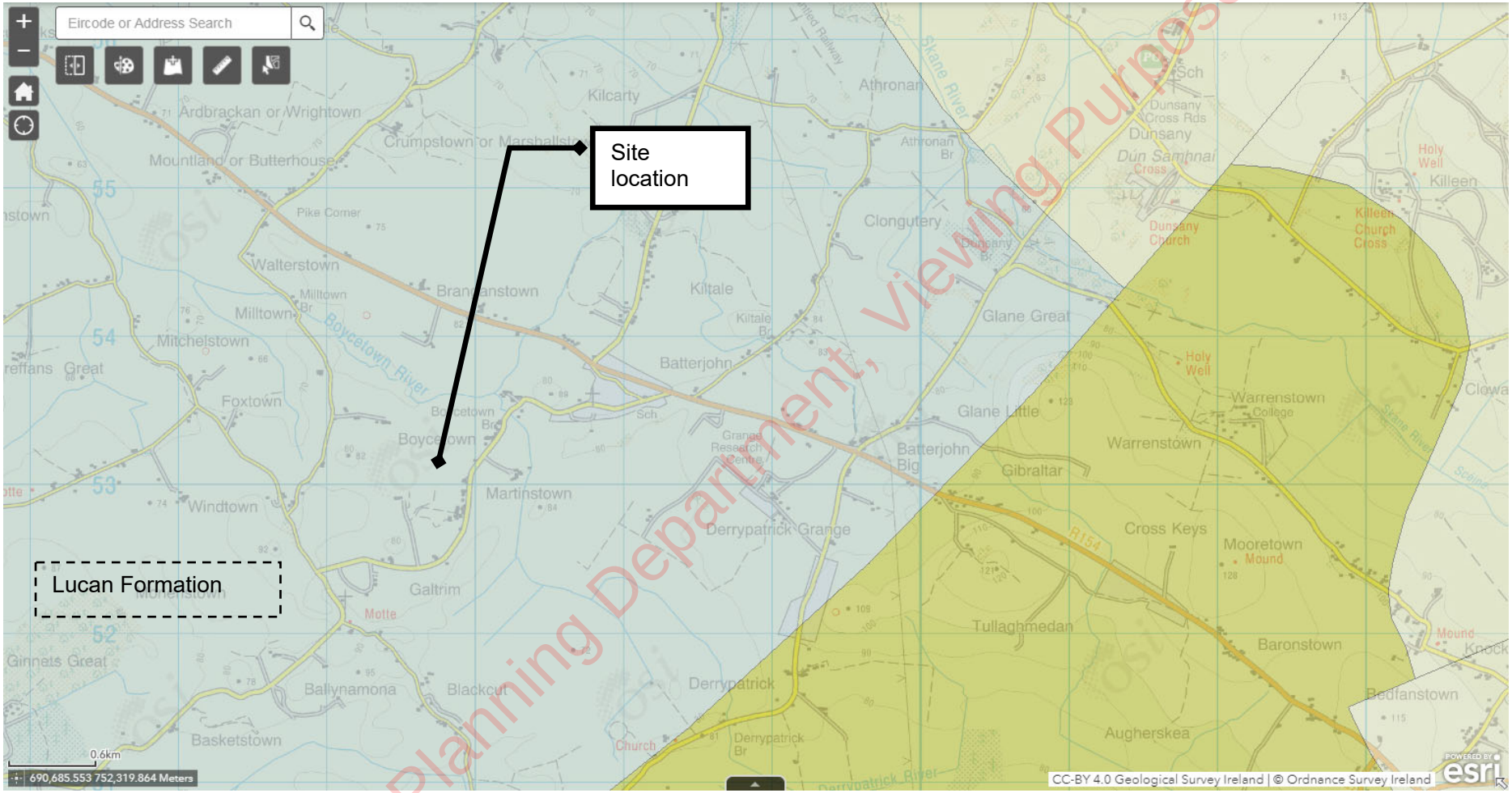


Figure 7-3: Bedrock Map

7.4 POTENTIAL EFFECTS

Potential effects during the construction phase include activities associated with the movement and placement of soils. This can result in temporary and permanent impacts on the geological environment.

In order to minimise any potential impact on the environment, including the soil, geological and hydrogeological environment (natural resource), avoidance of impact was incorporated into the design of the development.

Potential effects may include:

- Material being carried on to the local roads to Boycetown land reclamation; and
- Localised contamination of the ground as a result of fuel spillages from plant operating on site.

Wherever there are vehicles and plant in use, there is the potential for a direct hydrocarbon release which may contaminate the soil and subsoil. A spill has the potential to indirectly pollute water, if the soil and subsoil act as a pathway from any source of pollution. Any spill of fuel or oil would potentially present a low probability slight, long-term negative effect on the soil and geological environment. Good site practice can mitigate any effect in the short-term and long-term (refer to section 7.5)

The handling, storage and re-use of materials are of importance during the project. Topsoil should be stockpiled no higher than 2.5m and follow the recommendations set out in the NRA Guidelines for the Management of Waste from National Road Construction Projects (NRA, 2008a). There is potential for a slight negative effect on soil due to erosion of inappropriately stored excavated materials. However, any risk from the stockpiling of excavated materials can be managed through good site practice. The relatively flat topography of the site, combined with a robust sediment and erosion plan, greatly reduces the risk of erosion or sediment release to surface waters. The site topography prevents runoff to surface waters.

Due to the nature of the development, machinery will be present and operational on the facility. This may lead to occasional accidental emissions, in the form of oil, petrol or diesel leaks, which could cause contamination if the contaminants entered the soil environment. Similarly, there is the potential for leakage of process water from the proposed facility which could cause contamination of the soil and groundwater environment.

The potential impact associated with exposed soil surface principally relates to sediment laden run-off to watercourses. The greatest risk of sediment run-off occurs during wet weather. Management and control of water falling on worked areas are an important aspect in minimising the impact of construction. The implementation of such measures will ensure that surface water discharges have been of good quality. Much of the infrastructure and mitigation measures outlined herein have already been put in place for the construction and operation of the facility.

Mitigation measures are proposed in Section 6.5 below to reduce the impact on the soil environment.

7.5 MITIGATION MEASURES

Davin Plant Hire Ltd endeavour to ensure that there is no impact on the local or regional environment as a result of activities at Boycetown land reclamation. Several mitigation measures have been put in place at this location to ensure that any impact on the soils and geology within the landholding does not impact on the environment within and/or underlying the overall site and the surrounding area. Mitigation measures which have been implemented at Boycetown land reclamation include:

- The site will be operated responsibly and in accordance with an established Environmental Management System. A number of best practice measures have been implemented to ensure that surface water and groundwater in the area does not become contaminated by pollutants;
- There will be no requirement for dewatering as a result of the proposed works and, therefore, there is no potential for groundwater levels in the area to be directly impacted by the proposed activities at this location;
- An Emergency Response Kit is kept on site to prevent any leaks of petroleum-based products from reaching the water table;
- Surface water runoff will be managed at Boycetown land reclamation, reducing the potential for runoff with elevated suspended solids entering local surface water channels;
- A wheelwash will mitigate against the potential for vehicles exiting the site to carry materials on to the local road network.
- Soil-test P should be maintained at the lowest level compatible with agronomic production, to minimise loss to the environment and the threat to water quality.

7.6 CONCLUSION

In summary, there will be no significant alterations to the local and regional environment as a result of works within the application area. The restoration of the land to agricultural use will result in a minor beneficial increase agricultural activity in the area.

8 WATER

8.1 INTRODUCTION

This chapter aims to assess the potential impact of the proposed works within the area of Boycetown land reclamation identified as the Planning application area, as described in Chapter 2. This Chapter includes an assessment of any potential impact on the water environment within and surrounding Boycetown land reclamation. The water chapter provides a description of the surface water environment and the sub-terrain groundwater environment.

As the surface water and groundwater (hydrogeological) environment within the land reclamation area is managed as a unit, it was deemed appropriate to assess the site as a unit with references to the specific Planning application area within the land ownership boundary.

8.2 STUDY METHODOLOGY

The assessment methodology adopted has been informed by the following guidance and tailored to the specific requirements of the Proposed Project using professional judgement:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Statement (EPA, 2002) and draft revised guidelines (August 2017);
- EPA Advice Notes on current practice in the preparation of Environmental Impact Statement (EIS) (EPA 2003) and draft revised notes (September 2015);
- National Road Authority (NRA)[21] Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2009); and
- Office of Public Works (OPW) Guidelines for Planning Authorities (GPA) 20: The Planning System and Flood Risk Management (OPW and Department of Environment, Heritage and Local Government (DEHLG)[22] 2009).

The assessment of the water environment consisted of:

- A desktop study of available information;
- A review of site investigations, relating to surface water and groundwater undertaken within or adjacent to the land reclamation area;
- Review of all relevant surface water and groundwater quality monitoring data;
- Review of surface water quality monitoring data from the EPA; and
- Interpretation of all relevant data.

Information retained by the Geological Survey of Ireland (GSI), the Office of Public Works (OPW) and Environmental Protection Agency (EPA) was accessed to provide the hydrological and hydrogeological setting of the site. Relevant documents and datasets used to provide the setting of the site included EPA Water Quality Data, topography maps, and GSI Hydrogeological Data.

[21] Now Transport Infrastructure Ireland (TII)
[22] Now Department of Communications, Climate Action and Environment

Further to the description of the receiving environment, the site and activities were assessed in conjunction with aerial photographs of the land reclamation area to assess the areas where works have taken place within the Planning application area and the scale of potential impact on the existing water environment.

Any mitigation measures that have been implemented have been assessed and where required, measures are proposed to ensure that activities within the planning application area will not adversely impact upon the water environment outside of the site boundary.

Legislative / Guidance Review

An evaluation of the Proposed Project was carried out in relation to the relevant European and National legislation and other statutory policies and guidance. The following legislation was considered as part of this impact evaluation.

- Consolidated EIA Directive 2011/92/EU and 2014/52/EU;
- European Communities (Water Policy) Regulations 2003 [S.I. No. 722/2003];
- Waste Management Acts 1996 as amended;
- European Communities Environmental Objectives (Groundwater) Regulations 2010 [S.I. No. 9/2010];
- European Communities (Environmental Impact Assessment) (Amendment) Regulations, 2001 [S.I. No. 538/2001];
- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. 9 of 2010);
- Groundwater Directives (80/68/EEC) and (2006/118/EC);
- Water Framework Directive (2000/60/EEC);

The following documents were consulted in preparation of this report as they pertain to hydrogeology and hydrology:

- Meath County Development Plan 2015 - 2019

In addition to the Regulations and Guidelines above, this EIAR has been prepared with cognisance to the proposed draft revisions to these guidelines (December 2013 and June 2017).

The following guidelines have been taken into consideration in the preparation of this EIAR Report:

- *"Advice Notes on Current Practice in the Preparation of Environmental Impact Statements" (EPA, September 2003);*
- *"Guidelines on the Information to be contained in Environmental Impact Statements" (EPA, 2002);*
- *"Draft Guidelines on the Information to be contained in an EIS" (EPA, September 2015);*
- *"Draft Advice Notes on Preparing Environmental Impact Statements" (EPA, September 2015);*
- *Draft Guidelines on the Information to be Contained in Environmental Impact*

Assessment Reports' (EPA, August 2017), and

- EIA Directive 2014/52/EU.

8.2.1 Study Constraints

The aim of the assessment was to assess the impact of importing inert excavation spoil material for the purposes of land reclamation within the land reclamation area on the surrounding water environment.
In terms of site info and data collection, it is considered that sufficient information is available to characterise the water environment and to determine the impact, if any, of the development on the local and regional environment. No seasonal constraints were encountered, nor were there any constraints by lack of access to the site or its surrounds.

8.3 SURFACE WATER ENVIRONMENT

The purpose of this section is to describe the hydrological setting of the site and in particular:

- Surface water features and regional drainage;
- Flooding;
- Assessment of hydrometric data;
- Surface water abstractions; and
- Surface water quality.

8.3.1 Surface Water Features and Regional Drainage

The natural surface water drainage patterns in the environs of Boycetown land reclamation are shown in Figure 8.1.

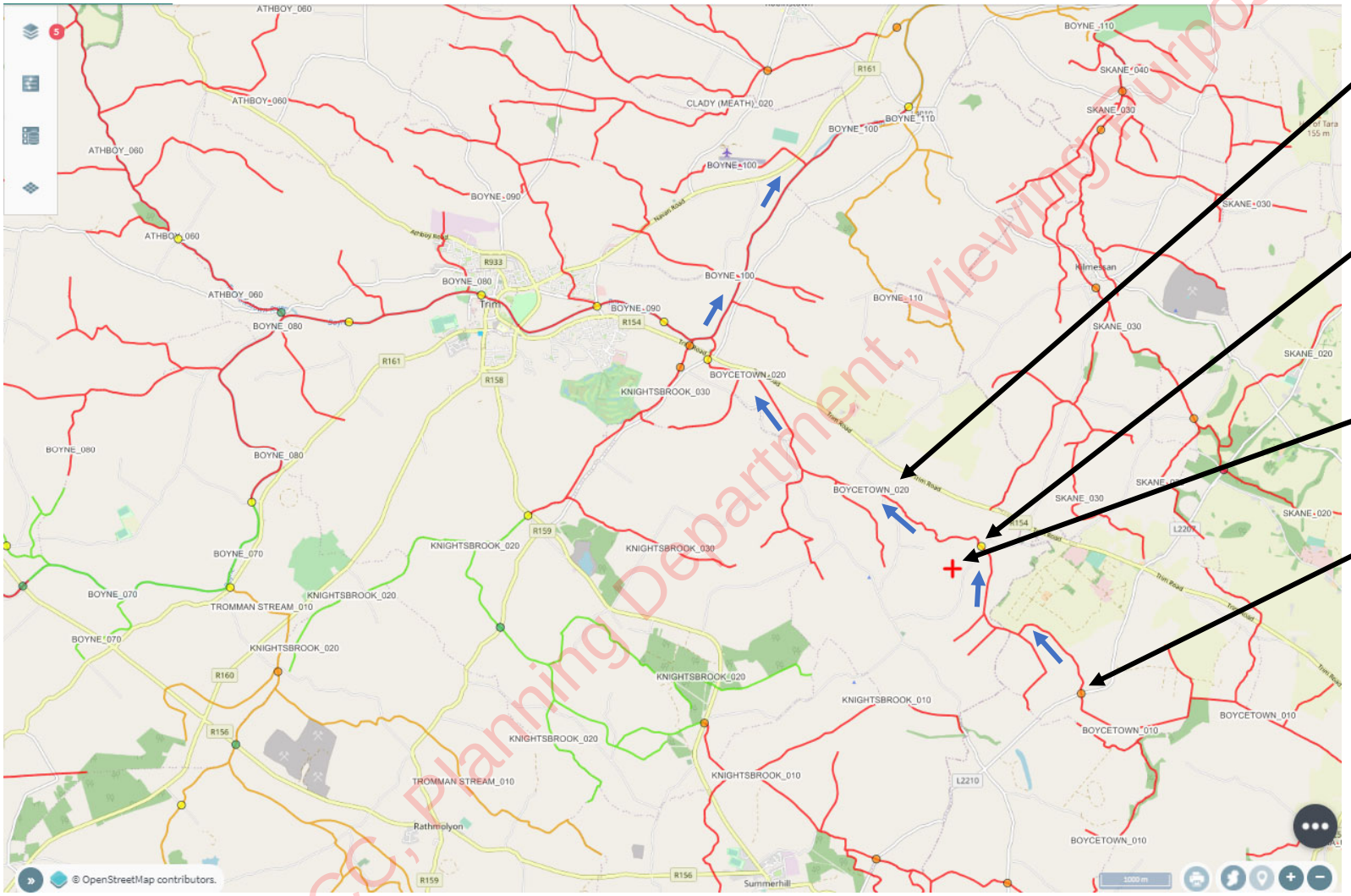
On a regional scale, Boycetown land reclamation and its environs are primarily located within the Boyne and Blackwater Catchment (Hydrometric Area 7). The nearest surface water features to the site include:

- River Boycetown –flows to the west of the landownership boundary.

Within the land reclamation area, surface water features include, historical temporary surface water collection sumps within the working areas of the land reclamation area and temporary standing water areas at topographical lows within the landownership boundary.

The site is located adjacent to a tributary to River Boycetown, which flows in a north-easterly direction towards Kiltale, Co. Meath. Surface water drainage patterns within the reinstatement area are determined largely by the topographical features within the locality.

Figure 8-1: Regional Surface Water Map



Boycetown_020
River Waterbody WFD Status
2013-2018: Moderate
Projected: At risk (2010-2015)

Station Code: RS07B030200
Station Name: Br N of Martinstown
Year: 2018
Q Value Score: 3-4
Q Value Status: Moderate

Site Location

Station Code: RS07B030100
Station Name: Boycetown-Derrypatrick Br
Year: 2012
Q Value Score: 3
Q Value Status: Poor

Key:
River Flow Direction

8.3.2 Flooding

This Flood Study included a review of the following data sources:

1. Planning System and Flood Risk Management (PSFRM) Guidelines;
2. Preliminary Flood Risk Assessment Maps;
3. Boyne Catchment Flood Risk Assessment and Management (CFRAM) Study;
4. Meath County Development Plan (2013-2019);
5. OPW National Flood Hazard Mapping Website.

The *Department of Environment, Heritage and Local Government* (*DoEHLG*) and the *Office of Public Works* (*OPW*) issued '*The Planning System and Flood Risk Management – Guidelines for Planning Authorities and Technical Appendices*' in November 2009. These guidelines outline a three staged approach to be adopted in carrying out Flood Risk Appraisals. This Flood Risk Assessment has been carried out as a Stage 1 Assessment – Flood Risk Identification. These guidelines identify three Flood Zones: Flood Zone A (Highest Flood Risk); Flood Zone B (Moderate Flood Risk); and Flood Zone C (Low Flood Risk).[23] Only flood Zone C is identified for the proposed area.

The CFRAM (Catchment Flood Risk Assessment and Management) programme is a national programme which to-date has produced a series of Preliminary Flood Risk Assessments (PFRA), which covers the entire country, see: http://www.cfram.ie/pfra/interactive-mapping. It must be noted that these maps are indicative and the OPW note that "these maps are indicative and they have been developed using simple and cost-effective methods that are suitable for the PFRA. They should not be used for local decision-making or any other purposes without verification. Part of the wet grassland was identified as pluvial flooding. This area however is drained with all drainage channels to the eastern drainage ditch. No areas of fluvial flooding are identified on the site. Based on the landowner experience the site has not flooded.

It can be concluded that the once measure outlined below are followed and the existing embankments are in place, the proposed development is not anticipated to cause any appreciable degradation in water quality to the River Boycetown or is not at risk from flooding from the River Boycetown.

8.3.3 Surface Water Abstractions

There are currently no known surface water abstractions from surface features either upstream or downstream of Boycetown land reclamation.

8.3.4 Surface Water Quality

[23] Flood Zone A (Highest Flood Risk)
- River Flooding: greater than 1% or 1 in 100
- Coastal Flooding: greater than 0.5% or 1 in 200

Flood Zone B (Moderate Flood Risk)
- River Flooding: between 0.1% or 1 in 1,000 and 1% or 1 in 100
- Coastal Flooding: between 0.1% or 1 in 1,000 year and 0.5% or 1 in 200

Flood Zone C (Low Flood Risk)
- River Flooding: less than 0.1% or 1 in 1,000
- Coastal Flooding: less than 0.1% or 1 in 1,000

The EPA monitors the quality of Ireland's surface waters and assesses the quality of watercourses in terms of 4(no.) quality classes; 'unpolluted' (Class A), 'slightly polluted' (Class B), 'moderately polluted' (Class C), and 'seriously polluted' (Class D). These water quality classes and the water quality monitoring programme are described in the EPA publication 'Water Quality in Ireland, 2016'.

The water quality assessments are largely based on biological surveys. Biological Quality Ratings or Biotic Indices (Q values) ranging from Q1 to Q5 are defined as part of the biological River quality classification system. The relationship of these indices to the water quality classes defined above, are set out in Table 7.2 below.

Table 8-1: Relationship between Biotic Indices and Water Quality Classes

Biotic Index	Quality Status	Quality Class
Q5, 4-5, 4	Unpolluted	Class A
Q3-4	Slightly Polluted	Class B
Q3, 2-3	Moderately Polluted	Class C
Q2, 1-2, 1	Seriously Polluted	Class D

The EPA conducts an ongoing monitoring programme of water quality in the Boyne RBD. The Boyne is classified as at Good Status for the 2010-2015 period.

A number of monitoring locations have been identified in the region surrounding Boycetown land reclamation. The 2 No. nearest monitoring stations are located approximately 2.5 km upgradient of the site boundary (Station No. RS07B030100 at Derrypatrick Br) and 0.6km downgradient of the site (Station No. RS07B030200 at Br N of Martinstown and are shown on Figure 8.2 with details in Table 7-2 below.

Sampling is conducted in summer months for a number of reasons. These include: (a) the macro-invertebrate fauna of Rivers are theoretically under the greatest ecological pressure from pollution, because of reduced flows and higher temperatures (McGarrigle et al. 2003); and (b) some macro-invertebrate larvae may not be recorded in freshwater systems during winter months[24].

Table 8-2: EPA Monitoring – Biotic Indices

Station No.	Location relative to the site	Code and Location	Status
Derrypatrick Br	Upgradient	RS07B030100	Q3, Poor Status
Br N of Martinstown	Downgradient	RS07B030200	Q3-4, Moderate Status

[24] Macro-invertebrate life cycles often involve an over-wintering strategy

Therefore, according to the EPA River Water Quality data, the quality of surface water upstream of Boycetown land reclamation is described as Poor upgradient on the River Boycetown with a slight improvement in the water quality towards the Boyne River (based on the Br N of Martinstown River station recorded water quality results).

According to the EPA Water Framework Directive (www.watermaps.wfdireland.ie) data the surface water in the area around Boycetown land reclamation has an overall risk rating of 'at risk' of not achieving good status. This data source also describes the river status near Boycetown land reclamation as Moderate. The objective for the catchment is to protect the River Boycetown catchment and prevent deterioration. The main pressures in the catchment are hydromorphology and diffuse agricultural inputs.

8.3.5 Surface Water

Surface water drainage patterns within the reinstatement area are determined largely by the topographical features within the locality. Precipitation landing within the site boundary infiltrates the soil surface directly due to the high permeability of the overburden. The River Boyne is a designated SPA and SAC and has a WFD classification of Good.

In June 2020, baseline surface water sampling was undertaken at surface water monitoring points up gradient (SW1) and down gradient (SW2) of the site. The results from this monitoring are presented in Table 8-3 below. `

The surface water quality in the Boyne as it flows past the site satisfies the Surface Water (2009) and Drinking Water Regulations (2007) and can be considered to be of good quality. Results show that there is no significant difference between surface water quality up gradient and down gradient of the site.

Table 8-3 Surface Water Monitoring *June 2020*

		SW1 upstream	*SW2 down-stream*	*Surface water regs 2009*	*Drinking Water Regs 2007*
Mineral Oil		*<10*	*<10*	*10*	
Nitrate (as N)	*mg l-1*	*2.6*	*1.7*	*11*	*11.3*
Alkalinity	*mg l-1*	*470*	*430*	*-*	
Orthophosphate (as	*mg l-1*	*0.034*	*0.033*	*0.035*	
pH	*pH units*	*7.8*	*7.9*	*5.5 - 9.0*	
Conductivity	*µS/cm*	*750*	*760*	*1,000*	

Table 8-4 Surface Water Monitoring *August 2021*

		SW1 upstream	*SW2 down-stream*	*Surface water regs 2009*	*Drinking Water Regs 2007*
pH	*pH units*	*7.8*	*7.9*	*5.5 - 9.0*	
Conductivity	*µS/cm*	*750*	*760*	*1,000*	
Turbidity	*FNU*	*4*	*4*	*NA*	

Restoration will be undertaken using naturally derived soil and stone verified in accordance with the EPA approved Waste Acceptance Criteria (2017) as presented in the EMP procedures in Appendix 1.1.

Given the points outlined above, it can be concluded that the proposed development will not impact the abundance and quality of the adjacent River Boycetown.

8.4 GROUNDWATER ENVIRONMENT

The purpose of this section is to describe the hydrogeological setting of the site and in particular:

- Groundwater Levels;
- Groundwater Quality;
- Aquifer Potential;
- Groundwater Vulnerability;
- Groundwater Usage; and
- Groundwater Flow.

The information provided below relates to the groundwater environment. It is provided to give context to the groundwater characteristics and flow patterns within and adjacent to Boycetown land reclamation.

8.4.1 Groundwater Monitoring (Levels and Quality)

The is no public supply or group scheme in the immediate area of Boycetown land reclamation. The nearest supplies are Kiltale public supply, 1km south east of the site, sourced from a well a number of kilometres to east of the village. Groundwater flow at the site is towards the drainage ditches on site. The site is not located in the Zone of contribution for the Kiltale GWS; therefore, no impact is anticipated. There are no domestic wells within 100m of the site. The soils on site are a surface water/groundwater gley with a shallow water table (0.4 to 0.5mBGL).

The infill works will be completed above the water table and, therefore, there has been no direct impact on the groundwater environment within the application area, or the overall site. It also appears that the water table is a subdued reflection of the onsite topography.

There will be no direct impacts on the groundwater table as a result of the land reclamation proposed in this application.

8.4.2 Aquifer Potential and Characteristics

Reference to the National Aquifer Map prepared by the GSI (www.gsi.ie) indicates that the Bedrock Aquifer underlying and surrounding Boycetown land reclamation is classified as a Locally Important Aquifer, which is Moderately Productive (Lm).

Table 8-5 gives details of the aquifer characteristics of the underlying aquifer and surrounding aquifers.

Table 8-5: Aquifer classification and characteristics

Type of Aquifer	Aquifer Classification	Permeability/Flow mechanism	Karst Features
Bedrock	**Locally Important Aquifer (Lm)**	**Generally Moderately Productive**	**No**

8.4.3 EPA/GSI Source Protection Zones

As reported by the EPA and GSI, groundwater sources, particularly public, group scheme and industrial supplies, are of critical importance in many regions. Consequently, the objective of source protection zones is to provide protection by placing tighter controls on activities within all or part of the zone of contribution (ZOC) of the source.

There are two main elements to source protection land surface zoning:

- Areas surrounding individual groundwater sources; these are termed source protection areas (SPAs); and
- Division of the SPAs on the basis of the vulnerability of the underlying groundwater to contamination.

These elements are integrated to give the source protection zones.

Two source protection areas are recommended for delineation:

- Inner Protection Area (SI). This area is designed to protect against the effects of human activities that might have an immediate effect on the source and, in particular, against microbial pollution. The area is defined by a 100-day time of travel (TOT) from any point below the water table to the source. In karst areas, it will not usually be feasible to delineate 100-day TOT boundaries, as there are large variations in permeability, high flow velocities and a low level of predictability. In these areas, the total catchment area of the source will frequently be classed as SI.;
- Outer Protection Area (SO), encompassing the remainder of the groundwater source catchment area or ZOC. It is defined as the area needed to support an abstraction from long-term groundwater recharge i.e. the proportion of effective rainfall that infiltrates to the water table.

According to the GSI/EPA source protection zone map (www.epa.ie), there are no source protection zones within or in the immediate area surrounding Boycetown land reclamation. The nearest identified source protection area is the Kiltale Group Water Scheme located to the east of Kiltale, approximately 3 km east of Boycetown land reclamation.

8.4.4 Karst Features

No karst features are recorded within the Karst Database of Ireland within a 5km radius of Boycetown land reclamation. No significant features are likely due to the presence of impure limestone underlying the site.

8.4.5 Groundwater Vulnerability

Groundwater vulnerability represents the intrinsic geological and hydrogeological characteristics that determine how easily human activities may contaminate groundwater. Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the water table and the attenuating capacity of the geological deposits through which the water travels. These factors are controlled by the types of subsoils that overlie the groundwater, the way in which the contaminants recharge the geological deposits (whether point or diffuse) and the unsaturated thickness of geological deposits from the point of contaminant discharge.

The vulnerability within Boycetown land reclamation is assigned a rating of high vulnerability. Surrounding areas are also described as high vulnerability due to the presence of overlying glaciofluvial sands and gravels sands and gravels (see Figure 8-2). Within the site boundary the groundwater vulnerability of the underlying aquifer is ‘Moderate’ to ‘High’. This designation is based upon 10 m of moderately permeable lake sediments, lacustrine type soils and 10 m depth of highly permeable sands and gravels, respectively.

Figure 8-2: GSI Aquifer classifications

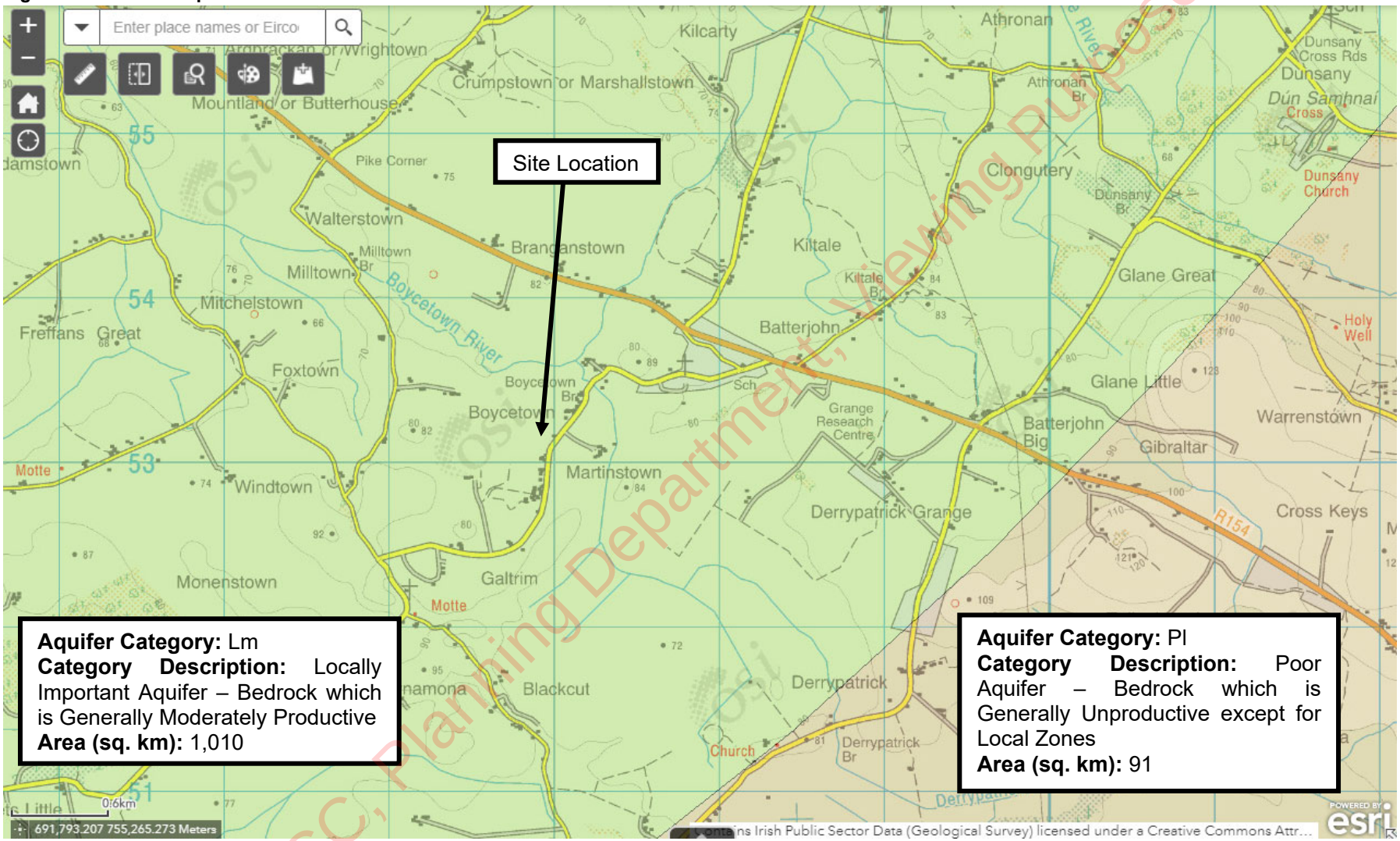
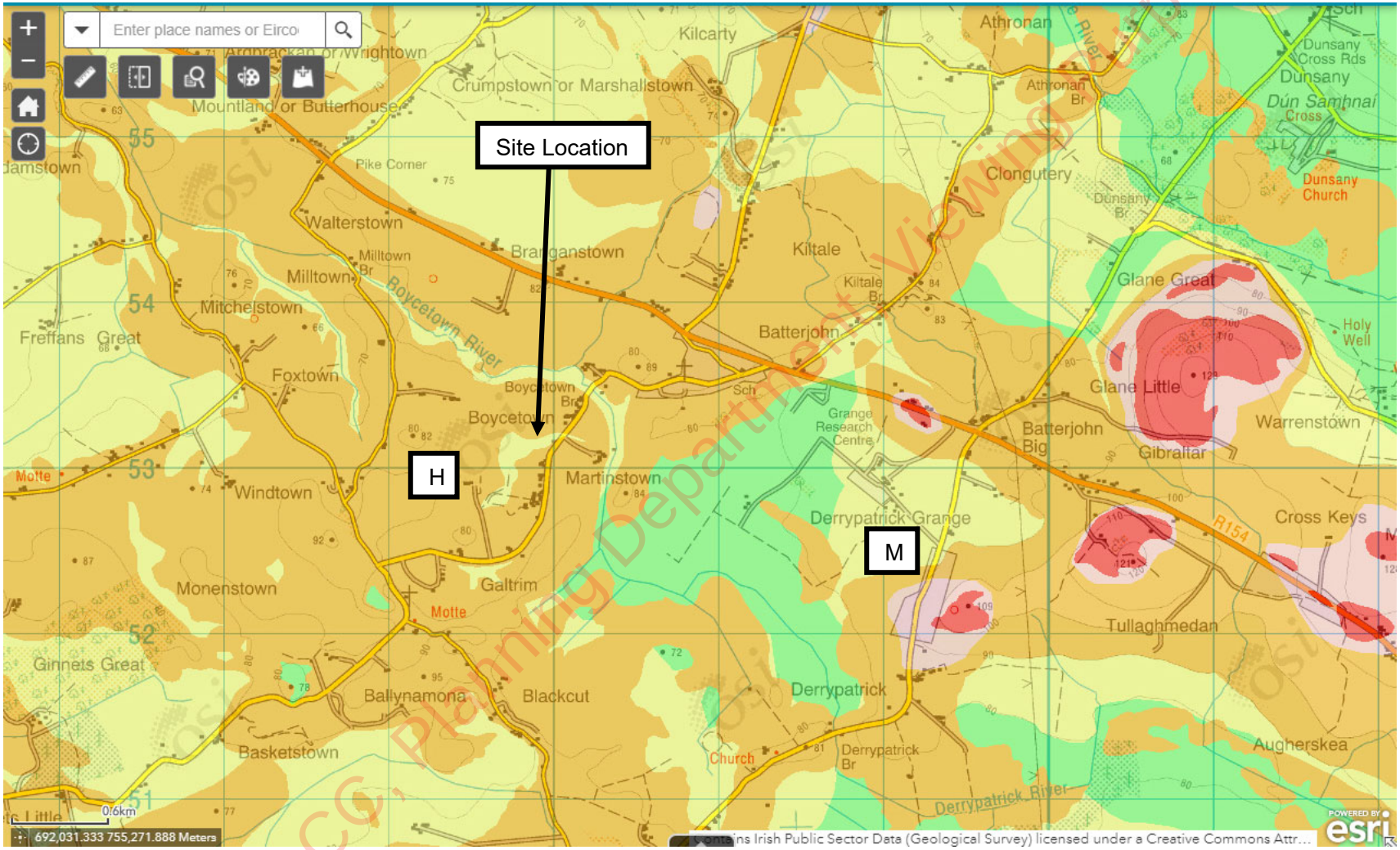


Figure 8-3: Vulnerability Map



Key:

National Groundwater Vulnerability Ireland

H High Vulnerability

M Moderate Vulnerability

Groundwater Flow

On a regional scale, the groundwater flow direction is generally a subdued reflection of surface water drainage. Therefore, on a regional scale and eliminating consideration of activities within the land reclamation area, the regional groundwater flow is considered to be towards the River Boycetown and ultimately discharging into the Boyne to the east. Groundwater flow paths within the sand and gravel deposits are generally limited due to subsoil depths.

Groundwater flow in the nearby streams, and subsequently the River Boycetown, comprises overland run-off and a component of groundwater baseflow.

8.4.6 Existing Pollution Sources

All domestic effluent in the general surrounding area of Boycetown land reclamation is treated by on-site wastewater treatment systems. The type of treatment system used to breakdown effluent is variable and is generally based on the age of the domestic dwellings. As evidenced by the surface water and groundwater samples, water quality on site and downgradient of the site is good.

8.5 POTENTIAL EFFECTS

8.5.1 Potential Impacts on Surface Water & Groundwater – Construction Stage

8.5.1.1 Infilling at Proposed Area

Typically, there will be no significant earthworks required on site during the construction stage of the proposed works at the infilling area. The construction phase will not have a significant impact on the hydrological regime due to the non-disruptive nature of the works.

8.5.1.2 Settlement Ponds

The excavation, grading and processing of subsoils may potentially impact on the surrounding surface water environment and the underlying groundwater environment. Surface water run-off from the construction areas may contain elevated suspended solids runoff associated with soil excavation. This run-off may discharge to surface water bodies, affecting water quality.

The use of concrete to form some structural base of the buildings has the potential to generate high alkalinity surface water run-off, which may discharge to the Boycetown River and its tributaries, affecting the water quality.

The use of plant and vehicles on all aspects of the proposed construction works brings with it the potential for hydrocarbon loss to the ground during refuelling operations. The released hydrocarbons would then have the potential to percolate to the underlying groundwater or to contaminate the surface water runoff and surface water body into which the run-off discharges.

Finally, improper waste disposal and sanitary waste disposal from temporary sanitary facilities during the construction stage may result in contaminated discharge to surface water bodies or to the underlying groundwater body, affecting water quality.

Summary Construction Impacts on Key Water Receptors

Potential impacts during the construction phase of the proposed development may arise from surface water runoff from excavation works. Accidental spillage of material such as fuel oil has the potential to pollute water features. Such accidental spillage could result in a temporary localised minor adverse potential impact as there is also an associated pollution risk. The temporary potential impact however can be managed with appropriate mitigation measures as outlined in this report.

Table 8-6 Impact evaluation of the construction phase (pre mitigation)

Receptors	Evaluation of Impact with Mitigation		
	Duration of Effect	Magnitude of Effect	Potential Impact
Boycetown River impact	Short Term	Minor adverse	Localised Minor Adverse

8.5.1.3 Temporary weighbridge, wheelwash, site buildings & access roads

The excavation, placement, grading and backfilling of soils may potentially impact on the surrounding surface water environment and the underlying groundwater environment. Surface water run-off from the construction areas may contain elevated suspended solids runoff associated with soil excavation. This run-off may discharge to surface water bodies, affecting water quality.

The use of compacted hardcore to form some structural elements of the infrastructure foundations and access roads has the potential to generate silt laden surface water run-off, which may discharge to the Boycetown Stream and its tributaries, affecting the water quality.

The use of plant and vehicles on all aspects of the proposed construction works brings with it the potential for hydrocarbon loss to the ground during refuelling operations. The released hydrocarbons would then have the potential to percolate to the underlying groundwater or to contaminate the surface water runoff and surface water body into which the run-off discharges.

The potential impacts from the construction on the surface water and groundwater environment is most likely where the land reclamation is in close proximity to surface water features, the potential for contaminated surface water run-off entering the drainage and feeding into the Boycetown River and its tributaries.

There will be no significant earthworks required on site as the foundations of all site infrastructure will be localised levelling and the foundations to be compacted hardcore laid evenly on the existing land surface. The construction phase will not have a significant impact on the hydrological regime due to the non-disruptive nature of the works. Care will be required during construction to prevent soil compaction and the use of permeable stone access tracks will ensure that the underlying soil conditions are not significantly affected by construction traffic.

Given the moderate to high groundwater vulnerability identified within the application area, equating to moderate to high permeability due to the presence of lucustrine type soils and glaciofluvial sands and gravels respectively. On this basis, a self contained effluent holding

tank is proposed for wastewater disposal. The tank is sized to allow for over 1month of storage on site.

Finally, improper waste disposal and sanitary waste disposal from temporary sanitary facilities during the construction stage may result in contaminated discharge to surface water bodies or to the underlying groundwater body, affecting water quality. The potential impact of the construction of is localised minor adverse.

Summary Construction Impacts on Key Water Receptors

Potential impacts during the construction phase of the proposed development may arise from surface water runoff from excavation works. Accidental spillage of material such as fuel oil has the potential to pollute water features. Such accidental spillage could result in a temporary localised minor adverse potential impact as there is also an associated pollution risk. The temporary potential impact however can be managed with appropriate mitigation measures as outlined in this report.

Table 8-7 Impact evaluation of the construction phase (pre mitigation)

Receptors	Evaluation of Impact with Mitigation		
	Duration of Effect	Magnitude of Effect	Potential Impact
Boycetown River impact	Short Term	Minor adverse	Localised Minor Adverse

8.5.2 Potential Impacts on Surface Water & Groundwater – Operational Stage

8.5.2.1 Infilling at Proposed Area

The deposition of inert subsoils can result in suspended solids in the runoff. Uncontrolled emissions of sediment laden waters can result in sedimentation of natural watercourses and can impact on fisheries potential.

The infilling within the proposed deposition extents will not result in working below the water table.

The Trim Public Water Supply is located 4.85 km northwest, hydraulically downgradient of the site. The borehole is a moderately yielding borehole that abstracts from an impure bedded limestone. It is considered that there is a no credible risk of impact on this abstraction source as a result of the licensed discharge subject the successful outcome to the planning application.

The movement of vehicles within the site represent a potential risk to the water environment, by means of leakages or spillages to the water drainages or into the ground. This potential impact is addressed in the mitigation measures through operational procedures already in place.

8.5.2.2 Settlement Ponds

During periods of high intensity rainfall (>5 mm/ hr) leading to higher volumes of runoff, the water regime within local zones of the infill area has been modified by collection of surface water runoff via the installation of surface water swales in the perimeter of the proposed deposition extents. The surface water runoff is drained, diverted and discharged to the settlement lagoons to the east of the site application area. This will occur throughout the lifespan of the infilling of the Boycetown deposition extent. The capacity of the pond is 3,375m3. The ponds provide significant capacity for settlement. Water will exit the settlement lagoons via an outfall.

The potential impact is the discharge from the settlement lagoons into the water environment, where the downstream water quality might depreciate and increased volumes and higher velocity into the drainage ditch, causing physical variations to the natural flow regime i.e. silt laden water and scouring and erosion of river banks which eventually feed into the Boycetown River. The predicted impact on water is considered to be medium term, localised and low adverse.

8.5.2.3 Temporary weighbridge, wheelwash, site buildings & access roads

The operation of the temporary weighbridge, wheelwash and site buildings will require daily inspection and maintenance visits. These works (pre mitigation measures) have a potential impact on the surrounding surface water and underlying groundwater environments. Elements of the weighbridge and wheel wash may contain hydraulic oils for insulation purposes. The released hydrocarbons would have the potential to percolate to contaminate the surface water runoff and the surface water body into which the run-off discharges.

As the site is agricultural land, the installation of temporary infrastructure may have the potential to result in a slight increase in runoff during the operational phase of the deposition extent at the site. The area of the weighbridge, wheelwash and site buildings represent <1 % of the total site area. The access road will be 3.5 m wide and constructed as permeable gravel therefore the quantity of discharge from the access roads to predevelopment flows will likely remain close to or at Greenfield runoff rates. As the site will remain a ‘greenfield’ there will be no change in the runoff characteristics, without even considering the storage in the settlement pond.

Improper waste disposal and sanitary waste disposal from site sanitary facilities during the operational stage may result in contaminated discharge to surface water bodies or to the underlying groundwater body, affecting water quality. The potential impact of the construction is localised minor adverse.

The pre mitigation impact is considered minor adverse. Mitigation measures including in Section 8.6.

Welfare facilities (i.e. toilet and washing facilities) at the site will generate effluents, which will be discharged to the holding tank, as the temporary facility and semi-frequent use is not suitable for the good operation of a septic tank system.

8.6 MITIGATION MEASURES

8.6.1 Mitigation Measures – Construction Stage

During the construction stage, best practice construction methods as set out in CIRIA c741 "*Environmental good practice on site guide will be implemented in order to prevent water (both surface water & groundwater) pollution*". This will include proper site management during construction, to ensure that all necessary measures are taken to prevent run-off/pollutants from entering any watercourse in the vicinity. Please refer to section 6 above for mitigation measures for ecology.

A 'Construction Environmental Management Plan' (CEMP) will be developed for the project, which the contractor will be obliged to follow to remove any risk of a pollution incident.

8.6.1.1 Infilling at Proposed Area

Typically, there will be no significant earthworks required on site during the construction stage of the proposed works at the infilling area. The construction phase will not have a significant impact on the hydrological regime due to the non-disruptive nature of the works.

8.6.1.2 Settlement Ponds

Water management infrastructure will be developed during the operational phase, whereby all water will be drained to settlement lagoons prior to outfall to the receiving environment. These settlement lagoons will act as low energy environments to allow sediment to fall out of suspension. No works are expected to occur below the water table. All water discharged from site will be diverted through an oil interceptor prior to discharge. Regular monitoring both upstream and downstream of the discharge point will occur for the duration of the operational phase.

The predicted impact on water is considered to be short term, localised and low adverse.

Best practice in soil excavation, placement, grading and backfilling will be implemented throughout the construction stage of the project in order to prevent water (both surface water and groundwater) pollution by run-off with high particulate loads, including the following mitigation measures:

- No in-stream works will be carried out. There will be no direct discharge of suspended solids or any other deleterious matter to watercourses.
- All surface water runoff will be collected by a temporary construction stage surface water drainage system and directed through a settlement sump, before discharging from the site.

8.6.1.3 Combined measures –Temporary weighbridge, wheelwash, site buildings & access roads

As with the above mitigation measures, the following standard practice pollution control measures will also be incorporated into the Construction Environmental Management Plan for the project, which the contractor will be obliged to follow to remove any risk of a pollution incident:

- On completion of the works, all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site;

- Any works directly affecting watercourses or riparian habitats will be submitted for assessment to IFI and approval in the form of a detailed method statement. Instream works are not proposed on the Boycetown River or its tributaries.
- All works must follow the guidance set out in the Guidance document entitled: CIRIA guidance note Control of Water Pollution from Construction Sites (CIRIA, 2001);
- Storage locations for excavated materials, equipment, hydrocarbons (including fuels for machinery) will be designated prior to commencement of works. Excavated materials will not be stored within 5 m of any ditches, dry or wet, watercourses or wetland areas.;
- Fuels, oils, greases, hydrocarbons and hydraulic fluids will be stored in 110% bunded compounds well away from the surface water drains. In addition, they must be adequately secured to avoid/minimise risk of vandalism;
- A spill method statement will be drawn up which all personnel must adhere to;
- A 24-hour, seven-day week Emergency Response protocol will be drawn up and implemented. This must be implementable in the unlikely event of an accidental spillage of chemicals, hydrocarbons or release of sediment to the surface or ground water system;
- Refuelling of machinery will be carried out on level, hard surfaced designated areas where possible. In the event that refuelling is required outside of these areas, fuel will be transported in a mobile double skinned tank and a spill tray will be employed during re-fuelling operations;
- All machinery will be regularly maintained and checked for leaks. Services will not be undertaken within 50 m of aquatic features, including dry drainage ditches. Servicing must be undertaken on level, hard surfaced designated areas where possible;
- An adequate supply of spill kits and hydrocarbon adsorbent packs will be available at labelled stations throughout the site with all vehicles onsite carrying spill kits. All relevant personnel will be fully trained in the use of the equipment. Any used spill kits will be disposed of appropriately off-site;
- No chemicals that are deleterious to aquatic organisms are to be used in cleaning works;
- All mitigation measures put in place must be inspected daily or weekly, as required during construction works; and
- All equipment and machinery must be cleaned prior to entry as bio security measure. This is to avoid transfer of invasive species on personal equipment and machinery which may have been used elsewhere to the receiving catchment. Reference must be made to IFI bio security protocol found at http://www.fisheriesireland.ie/Biosecurity/biosecurity.html.
- Due to the high permeability of the site gravels, a sealed tank is proposed to the handling of wastewater. The tank will be emptied on a regular basis by a licenced contractor.

8.6.2 Mitigation Measures – Operation Stage

Davin Plant Hire Ltd. will utilise all required infrastructure and operate 'good housekeeping' procedures if the development proposal is granted planning permission.

The mitigation measures to be adopted during the lifetime of the site have been designed to take into account the nature of water and the environment. The main concerns were the potential of any impact on the Boycetown River and catchment area, and the groundwater in the environs of the infill area.

The following mitigation measures will be implemented during the operational stage:

- All vehicles exiting the site floor will be required to divert through a wheel wash located towards the south of the site. This infrastructure will be utilised to ensure the vehicles do not cause soiling of roads.
- Any pollution materials such as fuel and hydraulic oils will be stored in bunded areas. The bund capacity will be sufficient to accommodate 110% of the largest tank's maximum capacity or 25% of the total maximum capacities of all tanks, whichever is the greater. The exception to this being double walled tanks equipped with leak detection, which do not require additional retention;
- Spill kits are retained on site to ensure that all spillages or leakages are dealt with immediately & staff are trained in their proper use. Any servicing of vehicles on site are not permitted and will be confined to designated and suitably protected areas offsite.
- The infill area and all site infrastructure are located outside of the flood plain areas;
- Regarding the surface water management for the proposed development, it is necessary to ensure that the development will not result in an increased risk of flooding elsewhere in the catchment. The existing design incorporates measures that ensure at a minimum that the stormwater discharge is limited to its greenfield equivalent; and
- The majority of the site comprises agricultural/permeable ground which provides varying degrees of natural infiltration. The proposed development will not increase the rate of discharge from the current pre-development run-off rates as there are limited areas of hard standing associated with the development.
- Wastewater effluent will be collected in a wastewater holding tank, and regularly collected. Due to the moderate to high permeability of the site lacustrine subsoils and the presence of glaciofluvial sands and gravels, a sealed tank is proposed to the handling of wastewater. The tank will be emptied on a regular basis by a licenced contractor.

8.6.2.1 Infilling at Proposed Area

- Stockpiling of large volumes of loose soil material onsite will be avoided, where possible, and imported material to be reworked, landscaped and restored. Exposed ground, soil and other materials stockpiles and any imported backfill material which are to be left in-situ for extended periods of time will be seeded with soil-binding grasses as shown in Planning Drawing 190-2106 Rev A.

- A berm will be installed along the eastern boundary to prevent direct runoff
- Silt curtains may be placed and maintained around stored imported and excavated soils and other materials. All surface water runoff over the area of the proposed infilling will be collected in the surface water swales and discharged into settlement lagoons to the east of the site, before discharging via the outfall to a settlement pond.

Surface Water

Owing to the relatively flat topography at the application site and its surrounding environs, all water falling onto the site is fully contained. It is not possible for such water to flow to watercourses under gravity conditions.

Water falling over the proposed deposition extent will drain into the perimeter surface water swales which then discharge to settlement lagoons for secondary treatment. These settlement lagoons will be act as low energy environments to allow sediment to fall out of suspension.

Monitoring of the quality of the outfall from the discharge weir will ensure that the quality of the surface water environment is not impacted.

Groundwater

Dewatering is not proposed at the site. The groundwater environment in the immediate vicinity of the site will not be impacted due to the infilling works to occur above the water table. The site is predominantly underlain by low permeability soils.

There are plans to infill the proposed deposition extent, with a maximum depth of 3.1 m with a typical depth of 2m. The post-infilled finished depth will range from 71.793 to 74.600m OD approximately. These levels are expected to be above the water-table as prefilling conditions would indicate, no adverse long-term impact is expected for the duration of the infilling operation and the local flow regime. Natural plant species will be allowed to vegetate the site area. Termination landscaping measures will be undertaken to blend the infilled area into its surrounding environment.

The new wheel wash system will recycle water within the system with occasional top up provided by way of a ball-cock valve.

Given the suitability of the existing environment for proposed infilling operations and the mitigation measures proposed there will be minimal impact on the existing environment as a result of the proposed refilling development.

8.7 RESIDUAL IMPACT

The nature of the proposed development dictates that the greatest potential impact for the water environment will be in the construction phase. With the implementation of the mitigation measures set out in this Report, a negligible impact on the aquatic environment is predicted for the construction phase of the proposed development. With regard to the

operational phase of the development, a negligible impact on the local water environment is predicted.

8.8 MONITORING

It is recommended that local surface water features i.e. upstream and downstream of the site at River Boycetown are monitored pre-construction, during construction and operation to take account of any variations in the quality of the local surface water and groundwater environment as a result of activities related to the proposed development.

It is proposed to undertake daily visual inspections (photographic log and daily records) with surface water monitoring for suspended solids on a weekly basis, during construction phase.

It is proposed to undertake weekly visual inspection at the settlement lagoon discharge outfall point and bi-weekly surface water monitoring for suspended solids. Surface water monitoring requirements will be developed in consultation with relevant authorities prior to the commencement of construction.

8.9 CONCLUSIONS

The potential impacts on the surrounding water quality, hydrology and existing drainage regime at the site are considered to be minor adverse and mainly short to medium term in nature. Detailed mitigation measures have been provided with regard to the design, construction, and maintenance of the proposed development. Therefore, no increased sediment loading in the watercourses is anticipated during the construction and operation phases of the proposed development. It is considered that there will be no significant residual impact on the water environment as a result of this development.

9 CLIMATE

9.1 INTRODUCTION

This chapter assesses the potential impact on climate arising from the proposed works at the Boycetown land reclamation in Kiltale/Dunsany, Co. Meath.

9.1.1 Methodology

All meteorological data contained in this report has been received from Met Éireann. This information has been adjusted where necessary to consider the land reclamation area's location and elevation. All calculations detailed in the report are advised methods as described by Met Éireann.

9.1.2 Weather Observing Stations

Rainfall Stations

There are a number of rainfall measuring stations throughout the country. These stations measure the daily rainfall in millimetres (mm). A number of these stations also measure additional parameters such as soil moisture, temperature, humidity, etc.

Synoptic Stations

Synoptic stations are those, which observe and record all of the surface meteorological data. These observations include rainfall, temperature, wind speed and direction, relative humidity, solar radiation, clouds, atmospheric pressure, sunshine hours, evaporation and visibility. They report a mixture of snapshot hourly observations of the weather known as synoptic observations and daily summaries of the weather known as climate observations. There are currently 24 synoptic stations (manual and automatic stations) located throughout Ireland.

9.2 DESCRIPTION OF THE SITE AND RECEIVING ENVIRONMENT

9.2.1 General Climate of Ireland

Over the summer months, the influence of anticyclonic weather conditions on the western and north western regions of Ireland results in dry continental air interspersed by the passage of Atlantic frontal systems. During much of the winter period the climate is characterised by the passage of Atlantic low-pressure weather systems and associated frontal rain belts from the west. Occasionally the establishment of a high-pressure area or anticyclone over Ireland results in calm conditions and during the winter months these are characterised by clear skies and the formation of low-level temperature inversions with light wind conditions at night time. If anticyclonic conditions become established for a few days or more during the summer months, high temperatures during the day might be recorded, especially at inland locations. Long spells of dry weather are relatively rare, but should continental air masses or anticyclones persist over Ireland a period of drought conditions may occur which could last up to two or three weeks.

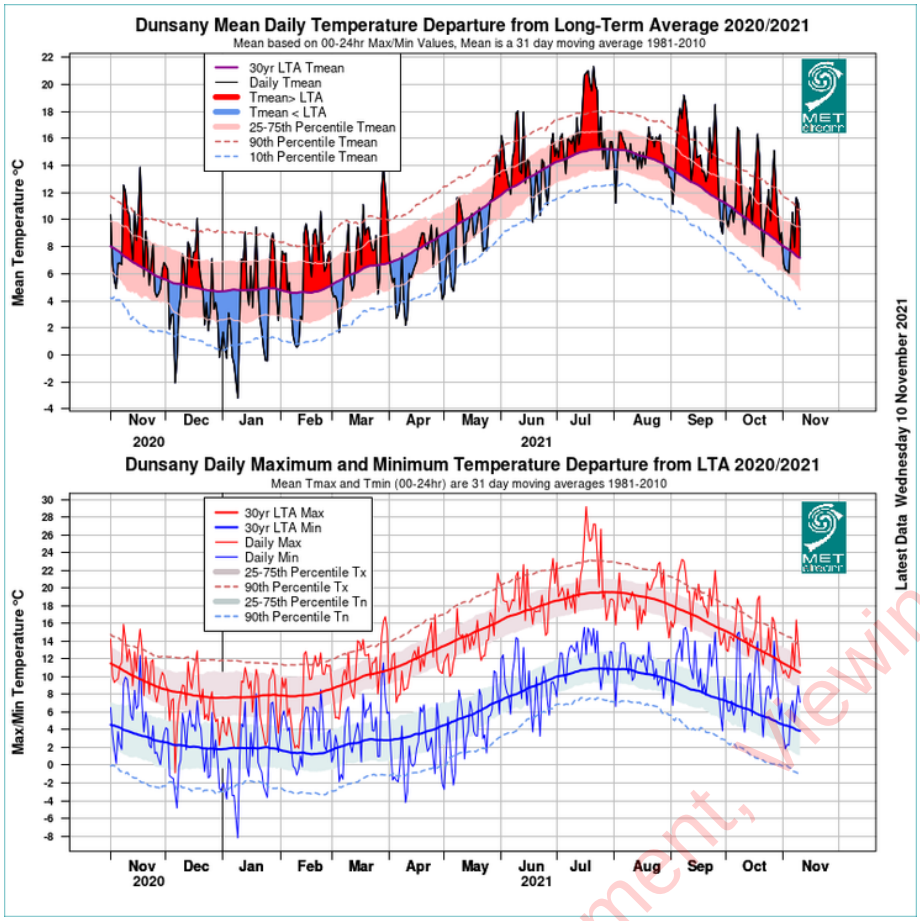


Table 9-1 Grange temperatures- Long term averages (www.met.ie)

9.2.2 Rainfall

In order to give reliable climatic data on a particular area a weather station should be located within 10km of the site and in operation for at least 30 years. A rainfall station is located at Dunsany Castle is approximately 2km east of the site. The present station was commissioned in 2006 replacing a manual climate station which was installed in 1963. Specifics of these stations relative to the site are outlined in Table 8.1.

Table 9-2: Designated Meteorological Stations for the Boycetown land reclamation

Location	Elevation (m O.D.)	Height Difference (m)
Boycetown land reclamation	68	-
Grange	83	15

The elevation of the land reclamation area site is approximately 68m O.D. The elevation of the rainfall gauge at Dunsany is approximately 15m O.D and the elevation of Dunsany Synoptic Station is approximately 6m O.D. According to Met Éireann, annual precipitation levels increase by 200 – 300mm per 100m elevations. The height difference between the rainfall gauge at Dunsany and the land reclamation area site is approximately 15m. Therefore, the annual precipitation due to the elevation of the land reclamation area site is negligible. Average monthly and annual precipitation levels are detailed in Table 8.2.

Table 9-3: Average Monthly & Annual Precipitation - Dunsany

	Dunsany – Long term average (m)	2021
Jan	<426	5482;$
Feb	9=2;	54428$
Mar	:728	8:$
Apr	:525	552<$
May	:925	54:2;$
Jun	;529	562:$
Jul	:528	=:25$
Aug	;;2;	9727$
Sep	;52<	7;2;$
Oct	=42:	7728$
Nov	<8	$
Dec	<726	$
Total	<:=2;	$

At the land reclamation area site, approximately 57% of the total annual rainfall is recorded during the winter period (October – March). This amount of precipitation (including snow) will normally be associated with more prolonged Atlantic frontal weather depressions passing over the region compared to the summer.

9.2.3 Evapotranspiration and Effective Rainfall

Evapotranspiration is the return of water vapour to the atmosphere by evaporation from land and by the transpiration of plants, generally measured from a short-grass covered surface (such as a permanent pasture) adequately supplied with water. Evaporation is the return of water vapour to the atmosphere by evaporation from a free water surface such as a pan of water, known as a 'Class A Pan', fitted with a depth measuring gauge. The potential evapotranspiration figures for Dunsany synoptic station are detailed in Table 8.3 overleaf.

It can be noted that evapotranspiration is very low during winter months, when temperatures are lower than summer months, relative humidity is generally higher and plant growth is minimal. The vast majority of evapotranspiration during winter months is attributable to direct evaporation from ground surfaces. During summer months the rate of evapotranspiration increases and often exceeds the monthly rainfall. This is due to increased free evaporation from the surface and from transpiration from leaves and plants.

Effective rainfall is defined as precipitation minus actual evapotranspiration. Using the estimated rainfall data for the land reclamation area and the potential evapotranspiration data for the nearest synoptic station i.e. Dunsany, the effective rainfall for the study area can be calculated. Refer to Table 8.3. Potential Evapotranspiration (PE) refers to the water flux

under unlimited soil water conditions. Actual evapotranspiration is estimated as 95% of potential evapotranspiration to allow for seasonal soil moisture deficits.

Table 9-4: Effective Rainfall for Boycetown land reclamation

Month	Rainfall (mm)	Potential Evapotranspiration (PE) (mm)	Actual Evapotranspiration (mm) (PE x 0.95)	Effective Rainfall (mm)
January	80.2	10.3	9.8	70.4
February	59.7	17.4	16.5	43.2
March	63.4	31	29.5	33.9
April	61.1	51.4	48.8	12.3
May	65.1	71.9	68.3	-3.2
June	71.5	80.5	76.5	-5
July	61.4	79.1	75.1	-13.7
August	77.7	65	61.8	15.9
September	71.8	44	41.8	30
October	90.6	22.9	21.8	68.8
November	84	10.3	9.8	74.2
December	83.2	7.5	7.1	76.1
Total	869.7	491.3	516	353.7

Any rain falling on the site will infiltrate to the ground, evaporate from the surface or become surface water runoff. The surface water runoff drainage system is discussed in more detail in Chapter 7 of this EIAR.

9.2.4 Wind

The closest synoptic station with the capability of measuring wind and that has been in operation for at least 30 years is Dunsany. This station is located approximately 25km west of the land reclamation area and is located at an elevation of approximately 101 mOD. No wind rose data is available for the site. The wind rose for Mullingar shows that the prevailing winds are from the southwest. Refer to Figure 9-1 'Mullingar Wind Rose Diagram' for further details. The mean wind speed from 1981-2010 (available 30-year average report) at Mullingar is 6.7 knots (3.4m/s). The mean monthly wind speed was 9.1 knots (4.6m/s). The maximum gust reached 58.3 knots. The mean number of days with gales during these years was 0.8 days. These wind speeds are likely to be indicative but slightly higher than those at the site.

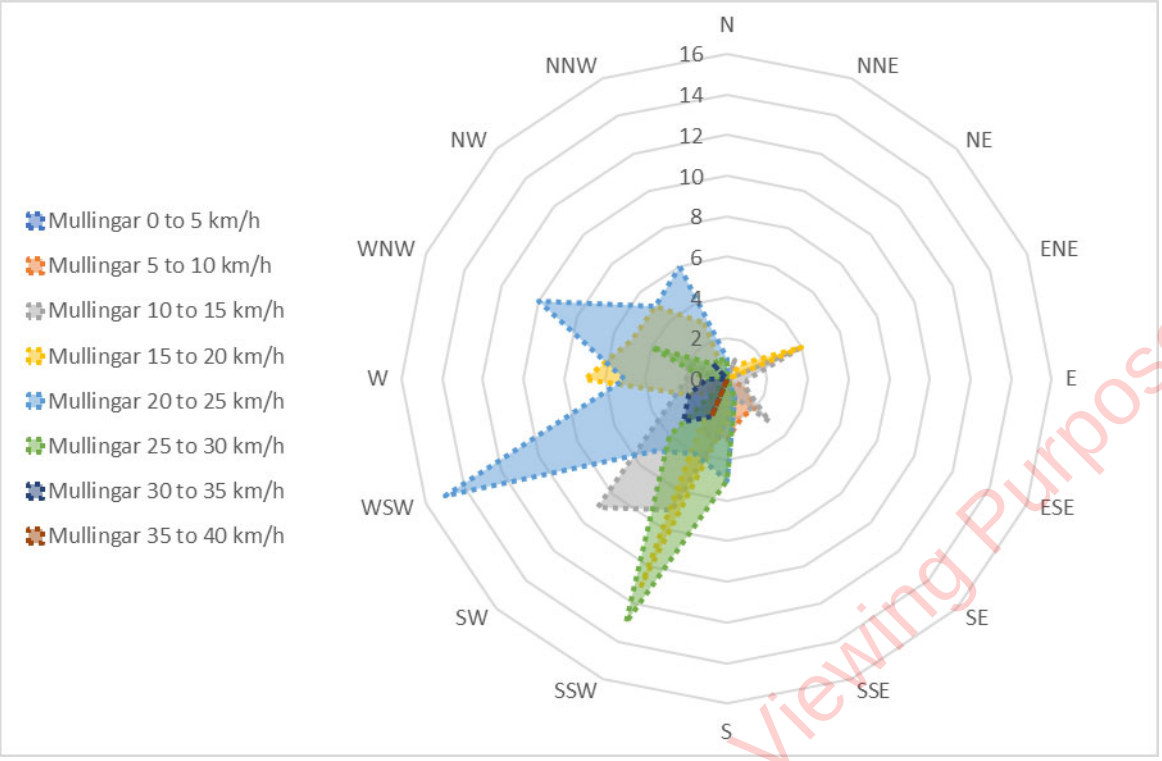


Figure 9-1 Wind Rose - Mullingar

9.3 POTENTIAL EFFECTS

On a local, regional and global scale, the climate has not been altered by the activities of the land reclamation area to date and will not be impacted as a result of the land reclamation at the site. The site restoration industry is not a significant industrial generator of greenhouse gases. There has been no net contribution to greenhouse gas emissions and this will continue. Therefore, this industry is not impacted by the limits of greenhouse emissions under the Kyoto protocol.

The site of Boycetown land reclamation has not created and will not create any temperature inversions, altered any current wind circulation patterns nor affected the sunshine or any other climatic factors in the area beyond the site boundaries of the land reclamation area.

9.4 MITIGATION MEASURES

As per the impacts detailed in Section 9.3 above, it is not likely that the proposed works at Boycetown land reclamation will have any impact on the local or global climate. Therefore, this project will not contribute to climate change.

However, mitigation measures will continue to be implemented at the site to ensure that activities at this location do not adversely affect the local or regional climate. These measures include:

- Managing all staff and contractors to ensure that machinery used on site is properly maintained and is switched off when not in use to avoid unnecessary dust and exhaust emissions from construction traffic; and that
- The site and all plant and equipment on site will be operated according to Best Available Technique (BAT) Guidelines.

10 AIR QUALITY

10.1 INTRODUCTION

All developments have the potential to adversely affect air quality within the surrounding area, particularly during the construction stage of a project. Disturbance of soils and the use of plant and equipment on site can cause windblown dust to develop on site and in the surrounding area.

10.2 METHODOLOGY & RESULTS

Currently in Ireland there are no statutory limits for dust deposition. However, in recent years, the TA Luft/VDI 2119/Bergerhoff Method of dust emission monitoring has become the most commonly used method.

This method involves using a direct collection pot to standardised dimensions of either glass or plastic. The system benefits from being a direct collection method i.e. less transferring of material and consequent reduction in sampling errors. This method is defined as an internationally recognised standard and has been adopted by the EPA as the method of choice for licensed facilities. The compliance threshold limit is 350 mg/m^2/day, as recommended by the TA Luft/VDI 2119/Bergerhoff Method.

The EPA guidelines for Management in the Extractive Industry (Non-Scheduled Minerals), recommend that the TA Luft total dust deposition limit value (soluble and insoluble) of 350 milligram per square metre per day be adopted at site boundaries near land reclamation developments.

10.3 RECEIVING ENVIRONMENT

Boycetown land reclamation is located in a primarily agricultural area within the townlands of Boycetown, Kiltale, County Meath approximately 1km west of the village of Kiltale, County Meath (refer to Figures 1.1. and 1.2). There are a number of residential properties located within a 1km radius of Boycetown land reclamation and are located along the regional road to west of the land reclamation area boundary and local county roads to the north and east. There are also a number of farm buildings in the vicinity of Boycetown land reclamation which would be expected as this is a primarily agricultural area.

10.3.1 Air Quality

The EU Clean Air for Europe Directive requires Member States to categorise geographic areas in terms of Zones and Agglomerations for the purpose of managing Air Quality. The vicinity of the proposed Castlebanny Wind Farm falls into the area classified as Zone D – Rural Ireland.
The main areas defined in each zone are;:Zone A: Dublin, Zone B: Cork, Zone C: Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise. And Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

A detailed description of the Air Quality Zones is given on the EPA website[25].

[25] http://www.epa.ie/air/quality/zones.

The proposed site is situated within the EPA's 'Rural East' Air Quality Index for Health Region. The most recent reporting by the EPA indicates that the current air quality in this region is classified as Good (according to EPA records accessed on August 2021). The Air Quality for Health Index is described in detail on the EPA website[26].

The EPA undertakes air monitoring at various sites nationwide as representations for a variety of settings. The most proximal air quality monitoring stations to the proposed wind farm are listed in Table 14-5. Although no data is available relating to air quality in the immediate vicinity of the study area, it is expected that the air quality at the proposed site can be represented by these sites as the data presented is the most recent data available and provides a reference of the air quality in a rural setting in relative proximity to the site.

The most recent monitoring carried out by the EPA is summarised in their annual report "Air Quality Monitoring Report 2019"[27]. Taking account of the urban/rural designations as listed above, nitrogen dioxide testing was carried out in four designated air quality sites, two rural (Zone D) and two urban, in order to fulfil the requirements of the Air Quality Standards Regulations, 2011 (S.I. No. 180 of 2011). Within a 5-year period, spanning from 2014 to 2018, assessment was carried out at the rural sites of Emo, County Laois and Kilkitt, County Monaghan, and at the urban sites of Castlebar, County Mayo and Enniscorthy, County Wexford.

The results[28] as presented below highlight a mean annual range of 2 - 4µg/m^3 in the rural test sites and 7 -13µg/m^3 in the urban test sites for the years 2014-2018. With the annual average maximum concentration at 40µg/m^3, both the urban and the rural sites were in compliance. The data from the rural stations below are likely to be representative of the typical background concentrations at the proposed development.

Table 10-1: NO2 trends for air quality monitoring stations in zone D.

Station	Averaging Period Notes 1, 2	Year		
		2016	**2017**	**2018**
Castlebar	Annual Mean NO_2 (µg/m^3)	9	7	8
	99.8th %ile 1-hr NO_2 (µg/m^3)	65.6	59.8	60.2
Kilkitt	Annual Mean NO_2 (µg/m^3)	3	2	3
	99.8th %ile 1-hr NO_2 (µg/m^3)	26.1	17.0	22.3
Emo	Annual Mean NO_2 (µg/m^3)	4	3	3
	99.8th %ile 1-hr NO_2 (µg/m^3)	35.5	27.5	41.6
Enniscorthy	Annual Mean NO_2 (µg/m^3)	10	-	-
	99.8th %ile 1-hr NO_2 (µg/m^3)	72.5	-	-

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).
Note 2 Hourly limit value - 200 µg/m^3 measured as a 99.8th percentile (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Similar testing was carried out for Particulate Matter of 10 microns diameter or less, with the sites chosen for monitoring shown below. Castlebar and Enniscorthy are chosen to represent urban environments and Kilkitt and Claremorris, County Mayo represent rural environments over the

[26] http://www.epa.ie/air/quality/index
[27] http://www.epa.ie/pubs/reports/air/quality/epaairqualityreport2019.html
[28] http://erc.epa.ie/safer/index.jsp

time period between 2016 and 2018. Over this period the results show the annual mean concentrations falling well below the annual average maximum value of 40 µg/m^3 (at 10 – 22 µg/m^3 and 8 – 12 µg/m^3 for urban and rural sites respectively) and the mean hourly concentrations falling well below the maximum of 50µg/m^3. The data from the rural stations are likely to be broadly representative of the typical background concentrations at the proposed development.

Table 10-2: PM_{10} trends for air quality monitoring stations in zone D.

Station	Averaging Period Notes 1, 2	Year		
		2016	2017	2018
Castlebar	Annual Mean PM_{10} (µg/m^3)	12	11	11
	90th %ile 24-hr PM_{10} (µg/m^3)	20.0	19.1	19.9
Kilkitt	Annual Mean PM_{10} (µg/m^3)	8	8	9
	90th %ile 24-hr PM_{10} (µg/m^3)	15.0	14.0	15.3
Claremorris	Annual Mean PM_{10} (µg/m^3)	10	11	12
	90th %ile 24-hr PM_{10} (µg/m^3)	17.4	17.3	19.9

Note 1 Annual average limit value - 40 µg/m^3 (S.I. No. 180 of 2011).
Note 2 Daily limit value - 50 µg/m^3 measured as a 90.4th percentile

Table 10-3: Air Monitoring Stations in Proximity to the Proposed Site

Monitoring Station	Proximity to Castlebanny Wind Farm	Air Quality Zone	Pollutants Measured
Mountrath, County Laois	Approx. 100 km	Zone D	SO_2, NO_2, CO, PM_{10}, C_6H_6, Pb, metals
Emo, County Laois	Approx. 80 km	Zone D	Continuous NO_2 Continuous O_3

Current data is available for a Zone D (Rural Ireland) monitoring location at Emo in County Laois on a continuous basis; however, the measurements are limited to the monitoring of Ozone and Nitrogen Dioxide only. Similarly, current data is available for a Zone D (Rural Ireland) monitoring on a continuous basis; however, the measurements are limited to the monitoring of PM_{10} and $PM_{2.5}$ only.

The monitoring location that is currently used to collate data on background air quality for Zone D (Rural Ireland) across the broader suite of air quality parameters is the Kilkitt air quality monitoring site in County Monaghan in conjunction with the Emo monitoring site in County Laois. Reference to each monitoring location is made below.

Air Quality Monitoring at Kilkitt, County Monaghan (Zone D – Rural Ireland)

The information on the EPA website relating to air quality monitoring notes, "The Kilkitt site is located in the drinking water treatment works at Kilkitt in County Monaghan. This is a rural setting with little traffic or other influences on air quality. Monitoring is done using continuous monitors for nitrogen oxides, sulphur dioxide and ozone. PM10 heavy metals and Benzo (a) Pyrene are also measured at this site."29

This location is the most reflective of the rural nature of the proposed development site.

Data from the continuous monitoring at Kilkitt, County Monaghan shows that nitrogen dioxide concentration is consistently below the 200µg/m3 EPA limit value, with concentrations generally in the range below 10 µg/m3.

[29] http://www.epa.ie/air/quality/data/kt/

Sulphur dioxide concentrations are consistently below the 125µg/m3 EPA limit value, with concentrations generally <2µg/m3**Error! Bookmark not defined.**. PM10 is monitored on a continuous basis. The conditions for a perceived exceedance in PM10, require the daily limit of 50 µg/m3 to be broken 35 times within a year or have an annual average of 40 µg/m3. The EPA Air Quality data demonstrates that the 50 µg/m3 limit for PM10 has not been breached in 2020.

Air Quality Monitoring at Emo, County Laois (Zone D – Rural Ireland)
The information on the EPA website relating to air quality monitoring notes, "The Emo site is located in the grounds of Emo Court, a stately home in County Laois. The site is heavily forested and was chosen to assess the levels of ozone in a forested area. Monitoring is done using a continuous monitor for ozone. Monitoring for oxides of nitrogen began in January 2013."
Data from the continuous monitoring presented from Emo Court shows that nitrogen dioxide concentration is consistently below the 200µg/m3 limit value and Ozone concentration is consistently below the 180µg/m3 limit (based on seven-day data available online).

10.4 POTENTIAL EFFECTS

There will be some dust and exhaust emissions from construction activities during the proposed works. These impacts will be temporary in duration and are not considered likely to give rise to significant impacts following the implementation of mitigation measures. Dust or pollutants generated from the proposed works will typically arise from:

- Movement of construction vehicles;
- Movement and placement of stock material; and
- Wind generated dust from stockpiles and exposed unconsolidated soils.

Given that the project comprises the recovery of inert soil and stone and land reclamation to improved agricultural land, the construction and operational phase of the project are considered the one process. Given the processes involved, dust generation from the site is likely to arise due to the transportation of material in / out of the site, on-site vehicle movement, and movement of material.

An assessment of the potential dust nuisance effect has been undertaken in accordance with The National Roads Authority (NRA) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes. Nuisance effects include soiling, PM deposition and vegetation effects. Given the limited number of site plant and loads delivered per day, as well as the minor use of haul roads, the proposed development would be considered similar to a minor construction site. Therefore, soiling effects will occur at 25 m and PM deposition and vegetation effects will occur at 10 m. This is presented in Table 12.1 below.

Table 10-4 Dust - Potential Distance for Significant Effects

	Potential Distance for Significant Effects (Distance from			
Scale	**Description**	**Soiling**	**PM10**	**Vegetation effect**
Major	Large construction sites, with high use	100 m	25 m	25 m
Moderate	Moderate sized construction sites, with moderate use of haul routes	50 m	15 m	15 m

Minor	Minor construction sites, with limited use of haul routes	25 m	10 m	10 m

Vehicle emissions from the proposed development are limited to site plant (i.e. excavator, dozer, etc.) and trucks used to transport the material to the site for processing. There are expected to be approximately 4 no. of plant on the site. Given the above, the vehicle emissions from the site are not considered significant.

The assessment of impact on air quality arising during the operational phase is mainly concerned with traffic-related emissions. The UK Highways Agency Design Manual for Roads and Bridges (DMRB), Volume 11, Section3, Part 1 (HA207/07) recommends a phased approach to the assessment of impact on air quality and that the complexity be consistent with the risk of failing to achieve the air quality standards. Initial scoping based on a desk-based review of background air quality, the magnitude of the proposed Development and the traffic data, indicates that a detailed assessment is not required. The UK DMRB states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed Development and should be included in a local air quality assessment: • Road alignment changes of 50m or more; • Daily traffic flows changes by 1,000 AADT or more; • HGV flow change by 200 vehicles per day or more; • Daily average speed changes by 10km/h or more, or, • Peak hour speed changes by 20 km/h or more. This is not considered to apply to the proposed Development. Due to the relatively small-scale nature of the works, it is expected that the potential impact on air quality will be low to negligible.

10.5 MITIGATION MEASURES

Davin Plant Hire Ltd endeavour to ensure that dust emissions are kept to a minimum at all locations and have taken all reasonable steps as far as is practical to minimise dust emissions. Several mitigation measures were put in place to limit dust emissions on site and in the surrounding area and will continue to be implemented for the proposed restoration activities:

- All stockpiles will be conditioned with water to minimise dust;
- The provision of on-site speed limits prevents unnecessary generation of fugitive dust emissions;
- Heavy Goods Vehicles (HGV's) exiting the site will be diverted through a wheelwash. This will ensure that dust emissions are not generated from the tyres of vehicles exiting the land reclamation area. It also ensures that they do not carry excess soil and material onto the public road network;
- A water bowser will be in operation along the main access road to ensure all material is dampened prior to exiting the location; and
- Dust monitoring will continue to be carried out on a monthly basis at the land reclamation area and the records retained as part of the EMP system in place at the site, in compliance with Department Guidelines.

The above mitigation measures will significantly reduce the potential for dust emissions. To date, it is considered that any residual dust emissions have not caused a nuisance and have not had a perceptible impact on the local or regional environment. This has been verified by a programme of monthly measurement using the TA Luft/VDI 2119/Bergerhoff Method at dust monitoring

locations at Boycetown land reclamation. Monitoring results are outlined in Section 10.2 above. The same dust monitoring programme will be in place for the period of the proposed works.

To ensure that dust is kept to a minimum, soil handling and placement will only take place when the soils are in the optimum condition. This optimum soil condition may be described as moist but friable. No soils will be moved when they are too dry or when there are unusually windy weather conditions. This will help to prevent erosion and any consequential creation of dust. Conversely, soils will not be handled during high intensity rainfall or when the moisture content of the soils is too high. This will ensure that smearing of the soils does not take place and that the soil retains its structure.

Grasslands shall be promoted in the early agricultural life of the site in order to promote good fibrous root growth and encourage soil structure development, as well as providing good ground cover.

10.6 CONCLUSION

The implementation of the above mitigation measures will ensure that the proposed works at Boycetown land reclamation will not result in an increase in dust levels in the local environment and the potential impact on air quality. It is not anticipated that there will be any impact on air quality.

11 TRAFFIC

This chapter presents a traffic assessment to obtain permission for the importation of inert excavation spoil comprising natural materials of clay, silt, sand, gravel or stone for the purposes of land reclamation including the access track to the restoration area. The site / activity area comprises of 5.1 ha in Boycetown, Dunsany, Co. Meath. This material will be sourced from local construction projects in the area of the site.

This chapter should be read in conjunction with the site layout plans and project description section (Chapters 1 and 2) of this Environmental Impact Assessment Report (EIAR). The traffic assessment has been prepared to assess the traffic impacts of the proposed land reclamation for the Construction, Operation and Decommission Phases of the Project.

In preparing this Traffic Chapter, reference has been made to the following documentation:

- Meath County Development Plan 2013-2019;
- Meath County Development Plan 2021-2027;
- TII DN-GEO-03031 Rural Road Link Design (June 2017);
- TII DN-GEO-03060 Geometric Design of Junctions (June 2017)
- TII PE-PDV-02045 Traffic and Transport Assessment Guidelines (May 2014);
- TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections (May 2019); and
- TII PE-PAG-02016 Project Appraisal Guidelines for National Roads Unit 5.2 – Data Collection (October 2016).

The objective of the assessment is to assess the potential traffic impacts associated with the proposed land reclamation. The assessment will look at the impacts that the reclamation site will have on the existing road network. This chapter will calculate the expected volume of traffic that will be generated by the land reclamation and assess the impact that this traffic will have on the operational capacity of the road network.

11.1.1 CONSULTATION

In order to ensure the scope of this report was to the satisfaction of Meath County Council, scoping was undertaken with Meath County Council Roads Department on the 19th of October 2020. The correspondence outlined the proposed approach regarding the requirements for traffic assessments and road safety for inclusion in this planning submission.

11.1.2 SITE DESCRIPTION

The proposed development is located at Boycetown-Kiltale which is a semi-rural area located 10km east of Trim Town. The entrance into the reclamation site will be accessed via a direct access onto the L6202-3 local road as shown in Figure 11-1 below.

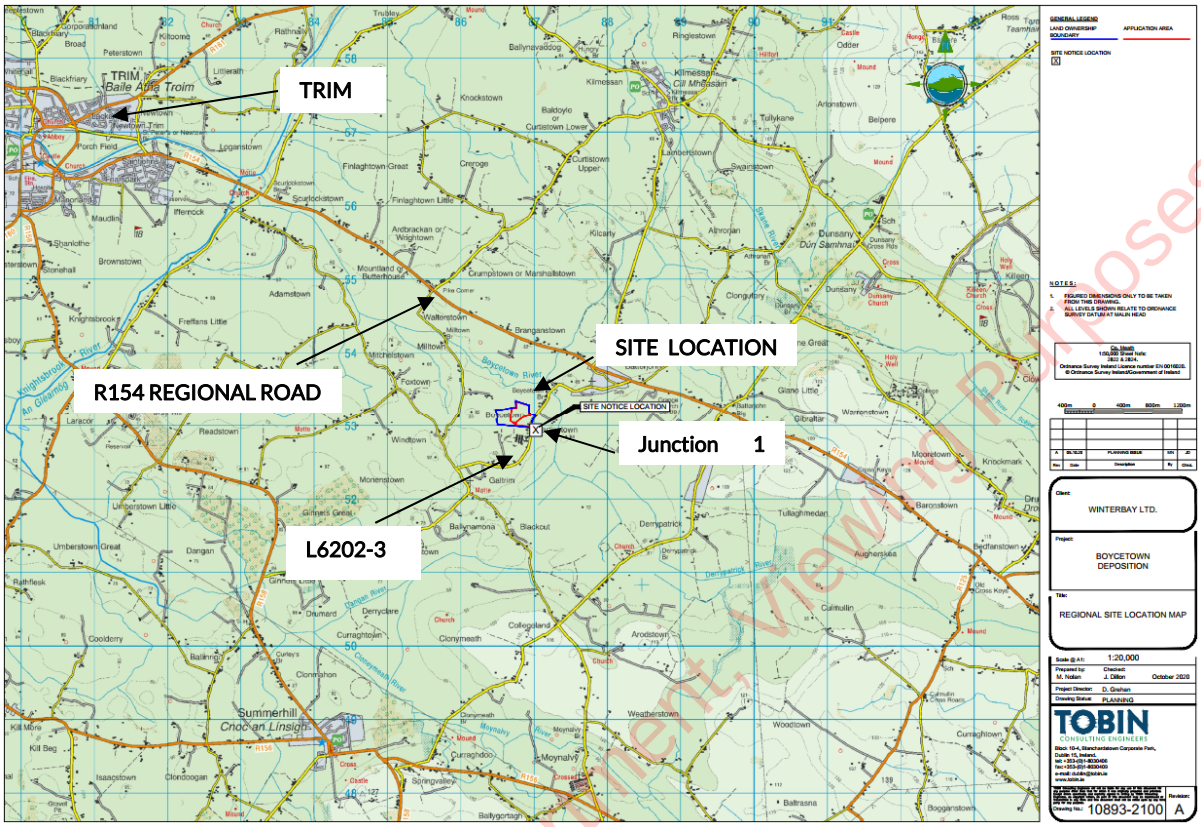


Figure 11-1: Site Location Map

Retention on the site entrance was granted under planning reference 211565.

11.2 EXISTING ENVIRONMENT

11.2.1 ROAD NETWORK

Regional Road R154

The R154 has a carriageway width of approx. 7m with grass verge on both sides of the road. The R154 has a default rural speed limit of 80km/h. Bus stops are located on both sides of the carriageway immediately north of the T-junction with the L6202.

Local Road L6202-3

The L6202-3 local road connects the site to the regional road network. The proposed site access is situated within an 80km/h default rural speed limit. The L6202-3 has a carriageway width of approximately 5.1m in the vicinity of the site access junction. Kiltale national school and Kiltale church are located on the L6202-3 30km zone of the village. Road width through Kiltale is 5.5 to 6m.

Regional Road R125

The R125 has a carriageway width of approx. 16m with hard shoulders on both sides of the road. The R125 has a default rural speed limit of 80km/h which links to Junction 6 of the M3.

11.2.2 DEVELOPMENT

11.2.3 Construction Phase

Construction traffic will be limited, the traffic will include delivery of hardcore and gravel for areas around office/canteen, portable toilet facilities and to construct internal access roads.

11.2.4 Operational Phase

All plant and equipment used within the application area is a mixture of fixed and mobile nature. The following plant is proposed:

- Bulldozer
- Tracked excavator
- Wheel wash
- Office facilities
- Weighbridge and
- Toilet facilities

11.2.5 Operational Hours and Staff

The land reclamation will operate during the hours of 07:00 to 18:00 Monday to Friday, and 08:00 to 14:00 Saturday.

The maximum rate of importation is 40,000 tonnes per annum with the anticipated rate to be lower than this rate. A summary of the estimated traffic is based on the maximum rate of extraction and is demonstrated in Table 11-1.

Table 11-1: Generate Traffic for the Land Reclamation

Proposed Average HGV				
	Volume (tonnes per	HGVs per year[1]	HGVs per week[2]	HGVs per day[3]

	annum)			
Total	40,000	2,084	42	9

Notes

(1) Assumed that 80% of trucks carrying raw materials had a payload of 19 tonnes and remaining 20% had 20 tonne payload.

(2) 50 working weeks assumed

(3) 250 day operations occurring between 07:00 and 18:00 on weekdays and between 08:00 and 14:00 on Saturdays

The site will also provide employment for approximately 4 no. full time staff and have the following facilities a wheel wash, an office canteen and portable toilet facilities.

11.2.6 Decommissioning Phase

Decommission works shall involve the removal of all plant and machinery, landscaping and restoration of areas on completion of extraction.

11.2.7 Haul Roads

The proposed haul road to the site for the importation of inert excavation spoil is via the L6202 local road and two regional roads; R125 and R154, which passes through South Meath between Dunshaughlin and Trim as show in Figure 11-2. The R125 provides access to the national road network of the M3 at Junction 6 (Dunshaughlin), located 9.3km east of the site entrance.

Figure 11-2: Proposed Haul Route (www.googe.ie/maps)

11.3 EXISTING TRAFFIC

In order to determine the magnitude of the existing traffic flows, the results of a classified automatic traffic counter was utilised. This traffic survey was carried out by Traffinomics on Thursday 16th September 2021. Count information was obtained on the L6202-3 local road.
This survey distinguished between light good vehicles and heavy good vehicles. The results of this survey indicated that the peak traffic levels through this location occurred between the hours of 08:00 and 09:00 and between 16:00 and 17:00.

Link-based growth rates (high sensitivity growth rates) were applied to the 2021 traffic flows to determine background traffic flows for the future assessment years.

11.3.1 DESCRIPTION OF Proposed JUNCTION

The site lies on the north-west of the L6202-3 local road as shown Figure 11-3 with an existing gated access. As shown on drawing 190-2103, a visibility splay of 2.4 x 90 metres is achieved to the south, and a distance of 99m to the north as per planning application TA211565.

Figure 11-3: Site Access – Aerial Map (www.googe.ie/maps)

11.3.2 TRIP GENERATION AND DISTRIBUTION

11.3.3 Seasonal Adjustment

In order to undertake an analysis, it is sometimes necessary to apply a correction factor to convert the traffic count data into seasonally adjusted traffic flows to take account of the seasonal variation that is experienced with traffic volumes. A comparison was undertaken between the neutral day chosen in September against the annual average daily traffic (AADT) in 2020. The traffic count data on the 16th of September (the mid-week day of the weekly count) was higher than the AADT, hence the traffic count data is more robust than the average annual values and no seasonal adjustment is required.

11.3.4 Opening and Future Year Flows

The proposed waste permit is for a 5-year licence with a proposed opening year of 2022. In addition to the opening year, and in accordance with TII guidelines, the capacity assessment was also based on traffic conditions forecast for the design years 2027 (+5 years).

The TII cumulative growth forecasts for Meath are shown in Table 4.1. The derived growth factors were applied to the 2021 traffic flows to determine background traffic flows for the assessment years. The assessment is split into light vehicles and heavy vehicles.

Table 11-2: High Growth Factors for light vehicle (LV) and heavy vehicles (HV)

	2022	2027
LV	1.041	1.129
HV	1.082	1.265

11.3.5 Traffic Generation

As outlines in Table 11-1, it is it is estimated there will be 9 (one-way) truck movements per day at the proposed land reclamation and two staff. The total daily traffic and peak hour traffic in a day is shown in Table 11-3 below.

Table 11-3: Existing Peak traffic volumes at the Land reclamation Access

Land reclamation Traffic at Site Entrance – Peak Activity 2013 Traffic Count						
			AM Peak		PM Peak	
Time	08:00-19:00		08:00-09:00		16:00-17:00	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
LV	4	4	4	9	0	9
HGV	9	9	0	9	4	9

The following assumptions have been made in the development of the Operational Phase Generated traffic:

- All operational staff will arrive in the AM peak (08:00-09:00) and depart in the PM peak (16:00-17:00);
- Assumed that operational staff will travel to work in their own vehicle (single occupancy); and

- Assume HGV operations within a 12-hour period per weekday and 6-hours on Saturday, deducting 1 hour for lunch.

11.4 PREDICTED IMPACT OF PROPOSED DEVELOPMENT

11.4.1 JUNCTION ANALYSIS

The existing site access, Junction 1 have been analysed using the Transport Research Laboratory (TRL) computer program JUNCTION 9 PICADY, widely accepted tools used for the analysis of priority junctions and roundabouts.

The key parameters examined in the results of the analysis are the Ratio of Flow to Capacity Value (RFC value – desirable value for PICADY should be no greater than 0.85 – values over 1.00 indicate the approach arm is over capacity), the maximum queue length on any approach to the junctions and the average delay for each vehicle passing through the junction during the modelled period.

PICADY requires the following input data:

- Basic modelling parameters (usually peak hour traffic counts synthesised over a 90-minute model period)
- Geometric parameters (including lane numbers & widths, visibility, storage provision etc)
- Traffic demand data (usually peak hour origin/destination table with composition of heavy goods vehicles input*)

*For the purpose of this report, the varying vehicle types have been segregated into light vehicles (LV) and Heavy Vehicles (HV) prior to input. Traffic volumes input into PICADY were in vehicles and, accordingly, commercial vehicle composition was set to the percentage of that arm.

A summary of the analysis results for the existing T-Junction for the AM and PM peak hours are provided below in Table 5-1. Full outputs from JUNCTION 9 PICADY are included in Appendix 11.

	AM						PM					
	Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction Delay (s)	Junction LOS
	2021											
Stream B-AC	0	0	0	A	0	A	0	0	0	A	0	A
Stream C-AB	0	0	0	A			0	0	0	A		
	2022 Without Dev											
Stream B-AC	0	0	0	A	0	A	0	0	0	A	0	A
Stream C-AB	0	0	0	A			0	0	0	A		
	2022 With Dev											
Stream B-AC	0	14.18	0.04	B	3.06	A	0.1	11.98	0.05	B	3.49	A

Stream C-AB	0	9.33	0.02	A			0	10.85	0.02	B		
	2027 Without Dev											
Stream B-AC	0	0	0	A	0	A	0	0	0	A	0	A
Stream C-AB	0	0	0	A			0	0	0	A		
	2027 With Dev											
Stream B-AC	0	14.23	0.04	B	2.86	A	0.1	12.02	0.05	B	3.24	A
Stream C-AB	0	9.31	0.02	A			0	10.78	0.02	B		

Table 11-4: Junction 1 Results; Proposed T-Junction AM and PM Peaks.

The above results indicate that the existing access will operate below the maximum desirable 0.85 RFC up to and including for the operational year plus 5 (2027) with the proposed development traffic. The maximum RFC reaching 0.05 in the PM peak with the development traffic in both years 2022 and 2027.

11.4.2 LINK CAPACITY

The link capacity is the maximum potential two-way capacity of a road between junctions. It is typically expressed in terms of Annual Average Daily Traffic (AADT). The capacity of the road network was assessed using TII DN-GEO-03031 Table 6/1*'Recommended Rural Road Layouts'*.

Table 11-5: Link Capacity

LINK CAPACITY							
Regional Road Number	Capacity maximum AADT	2021 Existing AADT	Utilised Link Capacity 2021	2027 AADT No development	Utilised Link Capacity 2027	2027 AADT With development	Utilised Link Capacity 2027 With development
L6202-3	5000	637	13%	708	14.2%	720	14.4%

The link capacity indicates that there will be 85.8% space capacity on the local road in 2027 with no development and with development his only reduces by 0.2% to 85.6%. This indicates that there is significant available spare capacity on the L6202-3.

The local road varies between 5.0 and 6.2 m between the site and Kiltale. The L6202 is detailed as a haul road in a number of previous planning applications. In relation to the road width, the road widening was previously conditioned under planning references Enrich FS19007, Kilsaran sand and gravel TA161396 and PL17.127397. The planning permissions

outlined utilise the L6202. The proposed development will utilise these permitted haul routes, predominantly on regional roads and a short section of a local road.

11.5 ROAD SAFETY

No collisions were recorded on the Road Safety Authorities (RSA) Collision Statistics database in the vicinity of the development, at the proposed site access or on the local road itself, see Figure 11-4. The Collision Statistics database identifies collisions from the year 2005 to 2016.

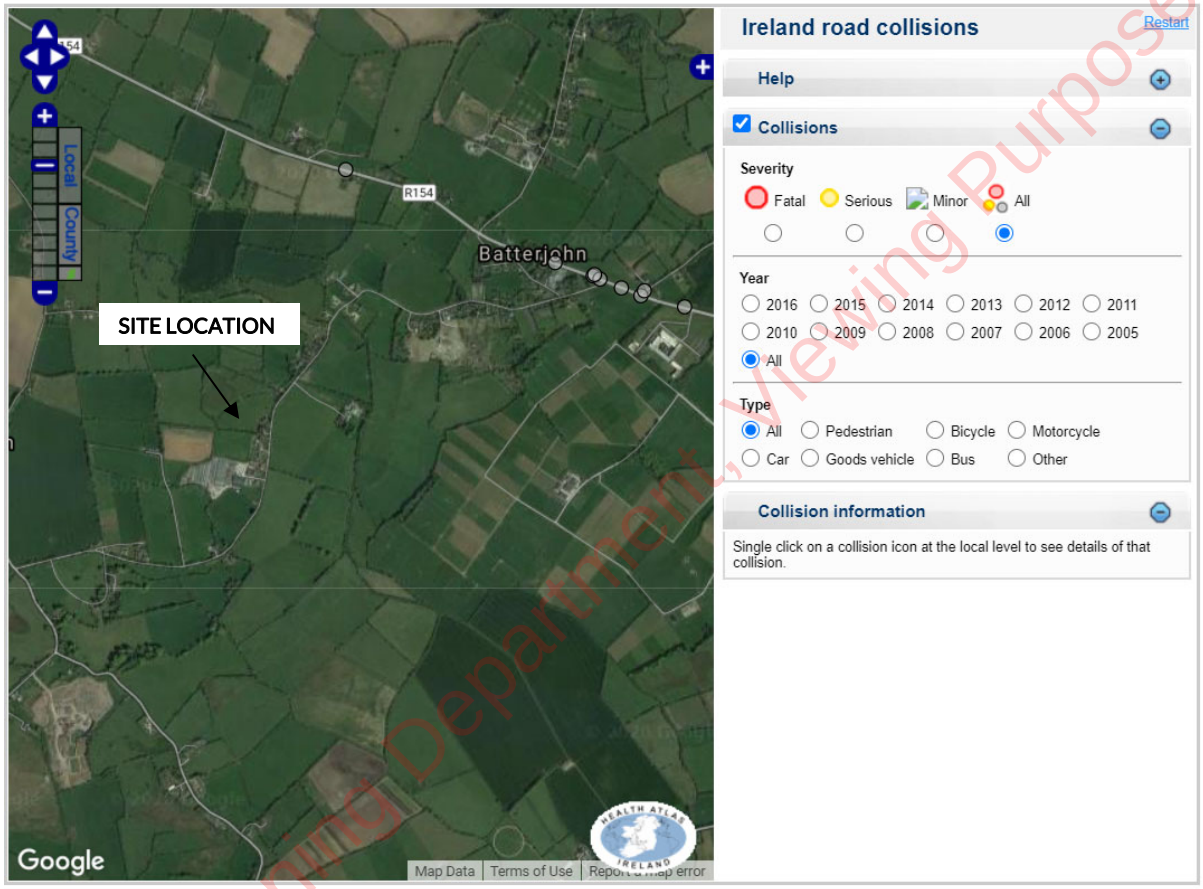


Figure 11-4: Collision Statistics in the vicinity of the Site Access

Note - the RSA database is not a comprehensive record of collisions and should be reviewed in conjunction with the Local Authority / Gardaí records for the site.

11.5.1 ROAD USERS

Motorists and Car Parking

Sufficient car parking spaces will be provided within the proposed land reclamation for the staff, thus ensuring parking associated with the land reclamation does not occur along the public road network.

Pedestrians and Cyclists

Pedestrian facilities will be provided where required within the proposed land reclamation to facilitate safe pedestrian movements in accordance with the land reclamation Health and Safety Plan. No specific provision has been made to accommodate cyclists.

11.5.2 Public Transport

There is no regular public transport service in operation in the immediate vicinity of the land reclamation. Therefore, it is not expected that the staff working at the land reclamation will utilise the bus services.

11.6 MITIGATION MEASURES AND MONITORING

The proposed access is wide enough to be 8m in width to accommodate two-way HV movements and the haul route into the site extends some distance from the public road to avoid the potential for queuing on the public road.

As noted in Section 11.4, the proposed development will not result in any significant increases in traffic on the local road, and the hourly and daily volumes of traffic using the access junctions along the haul route will not result in capacity issues.

As part of the ongoing monitoring of the proposed operations, data of the volumes of HVs using the weighbridge can be provided to the Local Authority to confirm that the actual volumes of HV traffic are reasonably in line with the figures in this report. It is recognised that the average HVs per day may vary, and the fleet composition may also vary, but that the maximum outgoing traffic movements will be based on the output of 40,000 tonnes per annum level.

The following mitigation measures are proposed:

- W170 Warning signage will be utilised on the local road either side of the existing entrance, alerting drivers to the presence of the site entrance and to the presence of slow-moving vehicles accessing the site.
- In order to prevent vehicles associated with the site operations causing obstructions or queuing on the public road, parking areas are provided within the site area to accommodate both HVs and light vehicles;
- A wheel wash will be supplied at the entrance to the site during operations to remove dirt and debris from the trucks prior to joining the local road network, in order to minimise public nuisance. The wheelwash is set back from the entrance further removing the potential for mud/silt on the road; and
- It is proposed that the sightlines at the entrance will be maintained with vegetation being setback as shown in drawings 190-2103.

11.7 CONCLUSION

Based on the information available, the proposed development will not result in an increase in traffic impact on the public road network. Assessment of the existing access indicates that the generated traffic for the design years 2022 and 2027 will operate well below capacity in the AM and PM peaks. The link capacity analysis showed that the local road will have significant spare capacity up to and including the design year of 2027. The local road varies between 5.0 and 6.2 m between the site and Kiltale. In relation to the road width, the road widening was previously conditioned under planning references Enrich FS19007, Kilsaran sand and gravel TA161396 and PL17.127397. The planning permissions outlined utilise the L6202. The proposed development will utilise these permitted haul routes, predominantly on regional roads and a short section of a local road. Advance warning signs will be erected in accordance with the appropriate standard. The entrance will be paved to a high standards and road markings provided. The infill is small scale, generating a steady rate of 1-2 truck loads per hour spread evenly over the full working day. Even in a worst case scenario, the link capacity indicates that there will be 85.8% space capacity on the local road in 2027 with no development and with development his only reduces by 0.2% to 85.6%. This indicates that there is significant available spare capacity on the L6202-3.

11.8 CONCLUSION

Overall, the proposed development will have minimal impact on the existing road network. Based on the information available, the proposed development will not result in an increase in traffic impact on the public road network. Assessment of the existing access indicates that the generated traffic for the design years 2021 and 2026 will operate well below capacity in the AM and PM peaks. The link capacity analysis showed that the local road will have significant spare capacity up to and including the design year of 2026. Overall, the proposed development will have minimal impact on the existing road network.

12 NOISE AND VIBRATION

12.1 INTRODUCTION

This section of the EIAR assesses the noise and vibration impacts associated with the proposed waste facility at Kiltale, County Meath. Chapter 2 provides a detailed description of the proposed facility. Alistair Maclaurin completed this chapter; he is an Acoustic Consultant in the Acoustics Section of AWN Consulting. He holds a BSc (Hons) and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has been working in the field of acoustics for over 7 years. He is a member of the Institute of Acoustics (MIOA).

12.2 ASSESSMENT METHODOLOGY

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter and included in the references section. In addition to specific noise guidance documents, the following guidelines were considered and reviewed for the preparation of this chapter:

- Guidelines on the Information to be contained in Environmental Impact Statements', (EPA, 2002);
- 'EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003);
- 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports', (Draft August 2017); and
- 'EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

The study has been undertaken using the following methodology:

- Review of relevant guidance in order to identify appropriate criteria for the development;
- Conduct a noise monitoring survey to quantify the existing noise environment in the vicinity of the development site and nearest noise sensitive locations;
- Predict the levels of typical noise emissions at the nearest noise sensitive locations for both the construction and operational phases;
- Predict the relative change in noise levels at the nearest noise sensitive locations due to the expected increase in road traffic for the operational phases;
- Assess the impact by comparing the calculated levels against the relevant criteria;
- Where necessary, specify ameliorative, remedial or reductive measures to control the impacts to be within the criteria;
- Present the predicted impact of the proposed development including the ameliorative, remedial or reductive measures, and;
- Describe the significance of the residual noise and vibration effects

12.3 ASSESSMENT CRITERIA

12.3.1 Construction Phase - Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion. However, there are several publications commonly used in Ireland to set appropriate construction noise criteria. Each of these is discussed in the following paragraphs.

TII Guidelines

Transport Infrastructure Ireland (TII) (formerly National Roads Authority (NRA)) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* contains information on the permissible construction noise levels for various hours of operation. The noise level limits are outlined in Table 12-1.

Table 12-1 Maximum Allowable Construction Noise Levels at Dwellings

Period	Noise Levels (dB re. 2x10-5 Pa)	
	$L_{Aeq,1hr}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority

British Standard BS5228

Potential noise impacts during the construction phase of a project are often assessed in accordance with British Standard *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*.

BS5228-1:2009+A1 gives several examples of acceptable limits for construction or demolition noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

> *"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."*

Paragraph E.2 goes on to state:

> *"Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed:*
>
> *70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;*
>
> *75 decibels (dBA) in urban areas near main roads in heavy industrial areas".*

For residential properties it is considered appropriate to adopt the 70 dB(A) criterion for periods between 07:00 hrs to 19:00 hrs Monday to Friday and 65 dB(A) criterion for periods between 08:00 hrs to 16:30 hrs on Saturdays.

The proposed standard construction hours are 08:00hrs to 19:00hrs Monday to Friday and 08:00hrs to 14:00hrs on Saturdays.

12.3.2 Construction Phase – Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

Building Damage

In terms of vibration, British Standard *BS 5228-2:2009+A1:2014 Code of practice for vibration control on construction and open sites – Vibration* recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. Taking the above into consideration the vibration criteria in Table 12-2 are recommended.

Table 12-2 Allowable vibration during construction phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
Less than 15Hz	**15 to 40Hz**	**40Hz and above**
15 mm/s	20 mm/s	50 mm/s

Human Response

Section B.2 of BS5228-2 addresses human response to vibration and identifies thresholds vibration can cause annoyance or interfere with work activities. The guide values in Table 12-3are presented within BS5228-2.

Table 12-3 Guidance on the potential effects of vibration levels

Vibration Level	**Effect**
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of the level in residential environments will cause complaint but can be tolerated if warning and explanation has been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

12.3.3 Operational Phase - Noise

The potential noise impacts associated with the proposed development are limited to:

- Additional traffic on public roads; and;
- Operational activities on site

Appropriate assessment criteria in relation to each of the above are discussed in the following paragraphs.

Additional Vehicular Traffic

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated change in traffic noise levels that will arises as a result of vehicular movements associated with the proposed development. To assist with the interpretation of the noise associated with additional vehicular traffic on public roads, it is proposed to adopt guidance from DMRB 2019.

Table 12-4 taken from Section 3.54 of DMRB presents guidance as to the likely impact associated with any long-term change in the traffic noise level ($L_{A10,18hr}$) at a noise sensitive receiver.

Table 12-4 Likely Impacts with Change in Noise Level on Public Roads

Magnitude of Impact	**Increase in Existing Traffic Noise Level (dB $L_{A10,18hr}$ or L_{night})**
	Short Term
Negligible	<1.0
Minor	1.0 – 2.9
Moderate	3.0 – 4.9
Major	≥5

The DMRB guidance outlined above will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely impacts.

Building Services Noise

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) on a residential environment is BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in "background" noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

- "Specific sound level, $L_{Aeq,Tr}$" is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T. This level has been determined with reference to manufacturers information for specific plant items.
- "Rating level" $L_{Ar,T}$ is the specific noise level plus adjustments for the character features of the sound (if any), and;
- "Background noise level" is the sound A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T. This level is expressed using the L_{A90} parameter. These levels were measured as part of the baseline survey.

The assessment procedure in BS4142 is outlined in the following steps:

1. determine the specific noise level;
2. determine the rating level as appropriate;
3. determine the background noise level, and;
4. subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10dB or more is a likely to be an indication of a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise impacts are typically considered to be neutral.

Assessment of other noise sources

For other noise sources not related to traffic on public roads or building services, appropriate guidance on internal noise levels for dwellings is contained within BS 8233:2014: *Guidance on Sound Insulation and Noise Reduction for Buildings* (BS8233). This British Standard sets out recommended noise limits for indoor ambient noise levels in dwellings as set out in Table 12-5.

Table 12-5 Recommended indoor ambient noise levels in BS8233

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living Room	35 dB $L_{Aeq,\ 16hr}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,\ 16hr}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,\ 16hr}$	30 dB $L_{Aeq,\ 8hr}$

For the purposes of this study, it is appropriate to derive external limits based on the internal criteria noted in Table 12-5. This is done by factoring in the degree of noise reduction afforded by a partially open window, typical 15 dB attenuation is noted in this British Standard. Using this correction value across an open window, the following external noise levels are proposed for other operational noise sources.

- Daytime / Evening (07:00 to 23:00 hours) 50 dB $L_{Aeq,1hr}$
- Night-time (23:00 to 07:00 hours) 45 dB $L_{Aeq,15min}$

BS8233 also provides criteria for external noise levels in amenity spaces. It states:

"it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,\ T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments"

These criteria are also in line with the following guidance taken from the World Health Organisation publication "Community Noise" which states:

> *"To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level should not exceed 55 dB L_{Aeq}."*

"At night-time outdoors, sound pressure levels should not exceed 45 dB L_{Aeq}, so that people may sleep with bedroom windows open."

Since there is the potential for short periods of noise to cause a greater disturbance at night-time, a shorter assessment time period (T) is adopted. Appropriate periods are 1 hour for day / evening time (07:00 to 23:00 hours) and 15 minutes for night-time (23:00 to 07:00 hours).

12.3.4 Operational Phase - Vibration

Due to the nature of the proposed development, no significant sources of vibration are expected to arise during the operational phase. Vibration has therefore not been assessed further in this chapter.

12.3.5 EPA Description of Effects

The significance of effects of the proposed development shall be described in accordance with the EPA guidance document Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR), Draft, August 2017.

The effects associated with the proposed development are described with respect to the EPA guidance in the relevant sections of this chapter.

12.4 RECEIVING ENVIRONMENT

The proposed development is rural in nature, mainly surrounded by open fields. The closest residential receptors are located from the south-west to the east and south-east of the site, as well as to the south-west and north-west of the site. Figure 12-1 presents the references and locations for the closest residential receptors surrounding the proposed site.

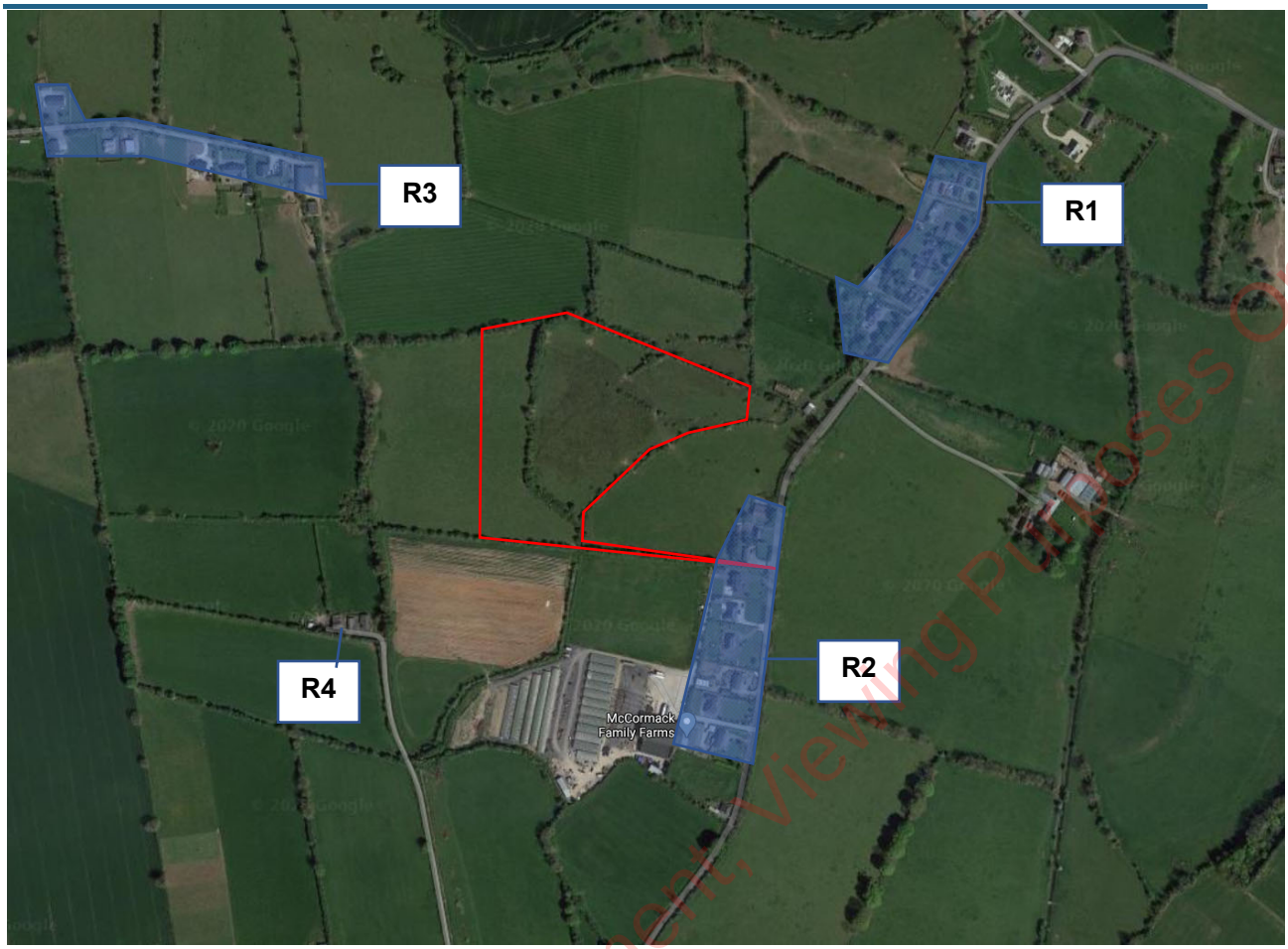


Figure 12-1 Noise locations

12.4.1 Environmental Noise Survey

An attended noise survey was conducted at the site between 12:30hrs and 16:00hrs on 10th September 2020. The attended measurements were carried out at three locations around the site to obtain a baseline noise levels in the surrounding environment, in particular close to the nearest receptor locations.

12.4.1.1 Monitoring Locations

Noise monitoring was undertaken at three locations considered representative of the closest noise sensitive receptors. Figure 12-2 presents the noise monitoring locations in isolation, described as follows:

A1 Location at roadside near to R2 receptors (and also representative of R1).

A2 Location at R4 (and also representative of R3).

A3 Location to rear (and quieter façade) of properties at R2 receptors (and also representative of R1).

Figure 12-2 Noise Monitoring Locations

12.4.1.2 Monitoring Procedure and Periods

The surveys were undertaken in general accordance with *ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.* The surveys were undertaken during dry and calm conditions.

12.4.1.3 Monitoring Parameters

The noise survey results are presented in terms of the following four parameters:

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{Amax} is the instantaneous maximum sound level measured during the sample period.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

12.4.1.4 Monitoring Results

The monitoring results for the attended survey are presented in Table 12-6.

Table 12-6: Noise Survey Results

Monitoring Location	Time	L_{Aeq}	L_{A90}	L_{AFMax}	Notes
A1	12:34	62	34	87	Road traffic dominant. Machinery audible from nearby McCormack Farms site. Foliage and birdsong.
	14:53	62	38	87	
	15:08	64	37	85	
A2	13:01	44	37	67	Noise from nearby McCormack Farms site dominant. Agricultural machinery audible.
A3	13:43	43	30	69	Local traffic dominant when present. Plant and activity noise from nearby McCormack Farms site. Foliage and birdsong.
	13:58	44	32	60	
	14:13	43	33	62	
	14:28	44	34	67	

It was observed that the noise environment at A1 and A2 was typically dominated by distant road traffic noise, at A3 the noise environment comprised of noise of agricultural machinery from the nearby McCormack Farms site.

12.5 POTENTIAL EFFECTS

12.5.1 Do Nothing Scenario

The Do-Nothing scenario includes retention of the current site without the proposed development. In this scenario, noise and vibration at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

12.5.2 Construction Noise

Given the limited amount of construction activities it is expected that the construction phase will be short term. It is possible to predict typical noise levels using guidance set out in BS5228-1:2009+A1:2014. Table 12-7 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme at a standard reference distance of 10 metres from the various plant items.

For the purposes of the assessment we have assumed that standard good practice measures for the control of noise from construction sites will be implemented. These issues are commented upon in further detail in the mitigation section of this chapter.

Table 12-7 presents the predicted construction noise levels at the nearest residential receptors located to the north of the site (approx. 130 m distance). Note, construction noise sources for site are assumed to be running 50% of the time.

Table 12-7 Construction Activity Noise Levels

Activity	Item of Plant BS 5228 Ref	dB L_{Aeq} at 10 m	Activity Noise Level at Receptor R2
Weighbridge, Wheelwash and Office Installation	Tracked Excavator (C4.63)	77	58
	Dump Truck (C4.2)	78	
	Pump (C3.25)	78	
	Compressor (D7 6)	77	

	Lorry (C2.34)	84	
Office Fitout	Hand tools	81	57
	Pneumatic Circular Saw (D7.79)	75	
	Internal fit – out	70	

The predictions indicate that with suitable mitigation measures in place the construction works will not exceed the proposed thresholds presented in Table 12-7. Consequently, a significant impact is not expected at the closest residential receptors.

12.5.3 Construction Vibration

Given the distances to the closest receptors (130 m) vibration is expected to be imperceptible.

12.5.4 Operation Phase – Additional Traffic

A Traffic Impact Assessment relating to the proposed development has been prepared as part of this EIAR. Information from this report has been used to determine the predicted change in noise levels in the vicinity of a number of roads in the area surrounding the proposed development, for the opening and design years.

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the development for both the public and private roads.

Public Roads

Traffic flow data in terms of the AADT figures has been assessed for the opening year on the public roads. A comparison of the baseline AADT and the opening year AADT of 673, indicate that there will be no perceptible change in noise level along the public road to the front of the proposed development. Referring to the criteria presented in Table 12-4 it can be concluded that the changes in noise level for all assessed public roads will be negligible and imperceptible.

Private Roads

For on-site traffic it is appropriate to compare the predicted noise levels of the new traffic flow with the ambient noise levels measured during the baseline noise survey. Vehicles arriving from the public road network will enter site through the access road entrance on south eastern boundary of the site and will then traverse the site to either the car park or other on-site facilities. A worst-case hour has been modelled for this assessment to account for this traffic, during this period it is expected that 4 HGV's will arrive on site.

The noise level associated with an event of short duration, such as a passing vehicle movement, may be expressed in terms of its Sound Exposure Level (LAX). The Sound Exposure Level can be used to calculate the contribution of an event or series of events to the overall noise level in a given period.

The appropriate formula is given below:

$L_{Aeq,T} = L_{AX} + 10\log10(N) – 10\log10(T) + 25\log10(r1/r2)$ dB

where:

$L_{Aeq,T}$ is the equivalent continuous sound level over the time period T (in seconds);
L_{AX} is the "A-weighted" Sound Exposure Level of the event considered(dB);
N is the number of events over the course of time period T;
r1 is the distance at which L_{AX} is expressed;
r2 is the distance to the assessment location.

The assumed mean value of Sound Exposure Level for cars and HGV's is in the order of 73 dB L_{AX} and 88 dB L_{AX} respectively at a distance of 5 metres. These values have been used to calculate the noise levels as a result of site traffic on the private access road.

The closest receptor to the traffic is at location R2, directly to the south of the proposed site access road. At this receptor location it is proposed to install a solid 2.5 m high barrier to reduce the impact of noise. Details of the barrier are presented in Section 12.6.2 and included in Appendix 11. The results of the assessment indicate that worst 1 hour on site traffic movements will produce noise levels of 51 dB $L_{Aeq,1hr}$ at the closest receptor. The remaining 10 working hours per day would have approximately 6 HGV's spread across them (i.e. less than 1 per hour as an average) and, hence, the noise levels will be lower. The noise level for the full 16-hour day period are calculated as 46 dB $L_{Aeq,16hr}$.

Reference to the criteria in Section 12.3.3 indicates that the resultant impact for the *worst peak hour* can be described as Negative, Moderate and Temporary. However, it should be noted that the values are below the absolute noise level set out in BS 8233 of 55 dB for external amenity spaces and are typical of the noise levels impacting on many dwellings located beside roads across Ireland. Additionally, the 16-hour daytime noise levels are only expected to be 2 dB higher than those currently measured on site, which can be considered a *slight* increase.

12.5.5 Operational Phase – On Site Activities

Noise sources associated on site activities of the operational phase of waste facility are typical mobile plant items such as excavators, loaders and bulldozers. A noise model has been developed using a proprietary noise calculation package Brüel & Kjær Type Predictor. This is an acoustic modelling package for computing noise levels in the vicinity of different types of noise sources. The calculation standard used in the model for fixed plant and industrial type sources is ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

The model takes account of the various factors affecting the propagation of sound in accordance with the standard, including:

- the magnitude of the noise source in terms of sound power;
- the distance between the source and receiver;
- the presence of obstacles such as screens or barriers in the propagation path;
- the presence of reflecting surfaces;
- the hardness of the ground between the source and receiver;
- attenuation due to atmospheric absorption, and;
- meteorological effects such as wind gradient, temperature gradient and humidity

For the purpose of this assessment, the use of 1 No. excavator, 1 No. loader and 1 No. dozer has been modelled to operate for 66% of the operating day within the site, two items of plant have been modelled to be operational simultaneously to determine noise levels at the closest noise sensitive locations to each boundary. Additionally, a berm has been modelled along the eastern boundary of the site, further detail of this mitigation measure is provided in Section 12.6.2.

Source data has been taken from BS 5228-1:2009+A1:2014 for the modelled items of plant as summarised. All source data is modelled using an A-weighted octave band spectrum.

Table 12-8 Source Noise Levels Used for Operational Activities

Plant Item	BS 5228 Ref	dB L_{Aeq} at 10 m
Dozer	C2.10	80
Wheeled Loader	C2.27	80
Tracked Excavator	C2.14	79
HGV	C2.33	81

The results of the assessment are presented in Table 12-9 below.

Table 12-9 Predicted Noise Levels at Receptor Locations

Plant Item	dB L_{Aeq} at 10 m
R1	44
R2	45
R3	43
R4	46

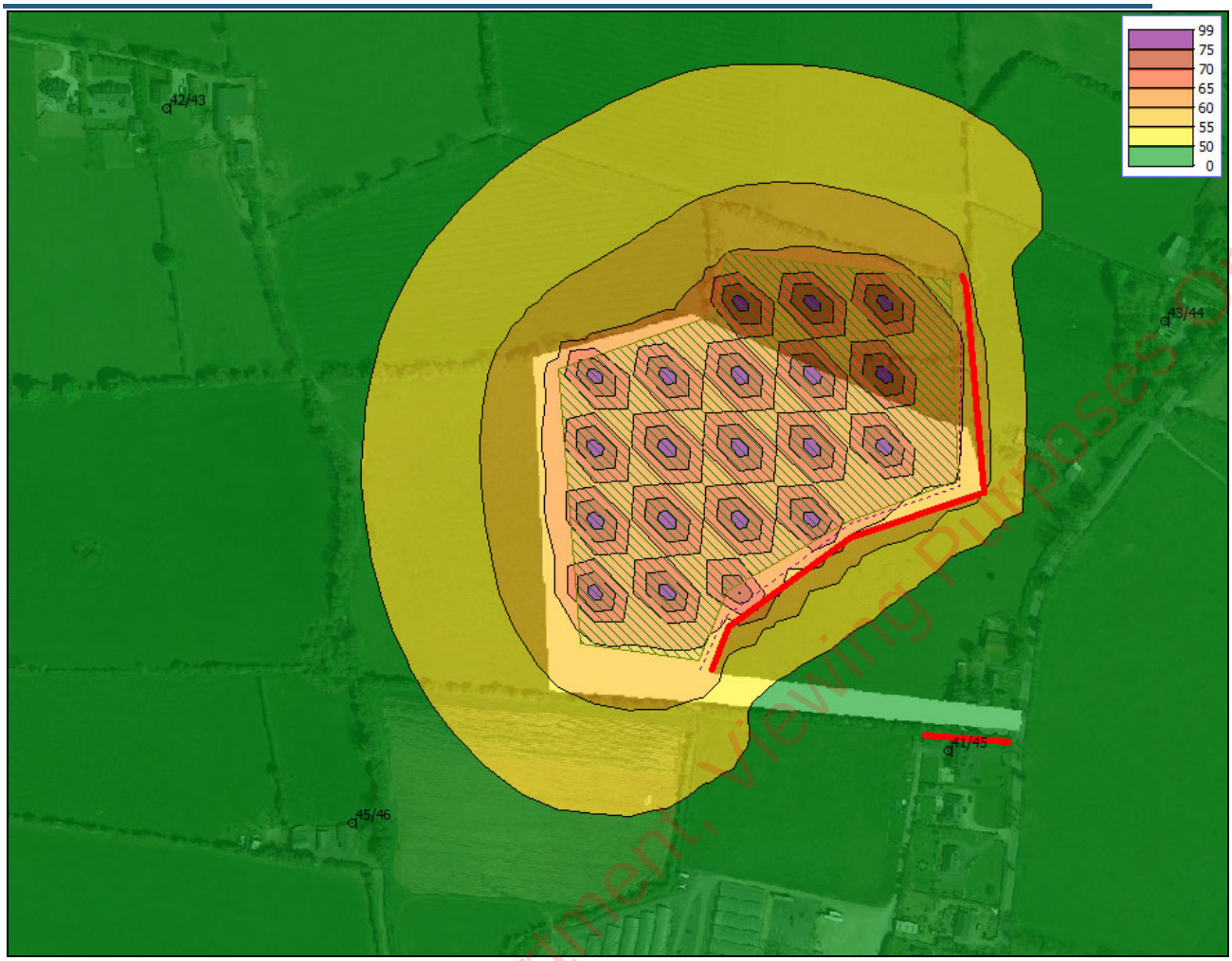


Figure 12-3 Model of the Proposed Site Activities

The results show that all noise levels will be within the external noise criteria of 50 dB $L_{Aeq,T}$ that is set out in Section 12.3.2 of this Chapter and they are also in line with current ambient noise levels measured around the site. Additionally, it is expected that the character of noise from operations will be similar to that of the agricultural machinery already experienced within the vicinity of the site. The impact of the operations on site can be described as Negative, Not Significant and Short Term.

12.6 MITIGATION MEASURES

12.6.1 Construction Phase

With regard to construction related activities, these are considered to be minor in duration and scope. However, utilisation of localised temporary construction noise barriers should be used during any activities with the potential to generate high levels of noise to break line of sight to the local residential receptors.

General noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include:

- no plant used on site will be permitted to cause an ongoing public nuisance due to noise;

- the best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- all vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- during construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1 2014. Part 1 – Noise;
- all items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures;
- limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted

Furthermore, it is envisaged that a variety of practicable noise and vibration control measures will be employed. These may include:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of good quality site hoarding to the site perimeters which will act as a noise barrier to general construction activity at ground level;
- erection of barriers as necessary around items such as generators or high duty compressors, and;
- situate any noisy plant as far away from sensitive properties as permitted by site constraints.
- where practicable, localised screening should be used during breaking activities to obscure line of site to the closest sensitive receptors.

12.6.2 Operational Phase

The layout and design of the site will incorporate a 3 m berm along the eastern boundary to protect the nearest receptors from noise. 12-3 present the location of the bund on the site plans.

In addition, a solid 2.5 m barrier of minimum 10 kg/m^2 mass is to be located along the boundary of the closest receptor to the south of the site access road, this is presented in Figure 12-4. Note that the dwelling to the north of the access road is involved with the proposed waste facility, hence a barrier has not been specified for that boundary.

Figure 12-4 Location of 2.5 m Barrier on Access Road

Further 'good practice' measures are recommended in order to ensure noise levels associated with the operational phase are minimised. They are as follows:

- The best means practicable, including proper maintenance of plant, are employed to minimise the noise produced by on site operations;
- Compressors are attenuated models fitted with properly lined and sealed acoustic covers which are kept closed whenever the machines are in use;
- Machinery that is used intermittently is shut down or throttled back to a minimum during periods when not in use;
- All operational plant is switched off during night-time periods when the facility is not in operation, with the exception of the compost building fans and the gas utilisation plant; and

12.7 RESIDUAL IMPACTS

12.7.1 Construction Phase

Residual impacts associated with construction activities undertaken on site are categorised as:

Quality	*Significance*	*Duration*
Negative	Moderate	Temporary

12.7.2 Operational Phase - Additional Traffic on Public Roads

Residual impacts associated with additional traffic on public roads are categorised as:

Quality	*Significance*	*Duration*
Neutral	Imperceptible	Short-term

12.7.3 Operational Phase - Additional Traffic on Private Roads

Residual impacts associated with traffic on the private access road during the *worst peak* hour and at the closest receptor (i.e. the dwelling directly bounding the proposed site access road) are categorised as:

Quality	*Significance*	*Duration*
Negative	Moderate	Short-term

It should be noted that the predicted noise levels during the worst peak hour are below the absolute noise level set out in BS 8233 of 55 dB for external amenity spaces and are typical of the noise levels impacting on many dwellings located beside roads across Ireland. Additionally, over the course of a *full 16 hr assessment* period the predictions indicate that noise levels will only be 2 dB higher than measured ambient levels and the impacts at the same receptor are considered:

Quality	*Significance*	*Duration*
Negative	Slight	Short-term

For all other receptors the impact is considered:

Quality	*Significance*	*Duration*
Negative	Insignificant	Short-term

12.7.4 Operational Phase - On Site Activities

Residual impacts associated with the on-site activities during the operational phase are categorised as:

Quality	*Significance*	*Duration*
Negative	Not Significant	Short-term

12.8 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered in the preparation of this Chapter.

12.9 REFERENCES

Meath Noise Action Plan 2019(NAP).

BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.

British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound

Design Manual for Roads & Bridges 2019

British Standard BS 5228 (2009 +A1 2014): Code of Practice for Control of Noise and Vibration on
Construction and Open Sites Part 1: Noise & Part 2: Vibration.

British Standard BS 7385 (1993): Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.

Calculation of Road Traffic Noise, Department of Transport Welsh Office, HMSO, 1988.

ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise.

ISO 9613 (1996): Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.

EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002).

EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003).

EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (Draft August 2017).

13 LANDSCAPE AND VISUAL

13.1 INTRODUCTION

This report examines the landscape and visual impact of the proposed restoration works within the Planning application area of Boycetown Land reclamation within the townlands of Boycetown, Dunsany, Co. Meath. The assessment also includes a description of the surrounding landscape character and describes any measures required to reduce the visual impact of the development.

Boycetown Land Reclamation is located in the Boyne lowlands, west of Kiltale, County Meath. It is situated approximately 7km from Trim and Dunboyne, Co. Meath. This report assesses the landscape and visual effects of the Planning application Area.

13.1.1 Basis for the Landscape Impact Assessment

This report uses the 'Guidelines on the Information to be contained in Environmental Impact Statements' prepared in March 2002 on behalf of the Environmental Protection Agency (EPA) as the basis for the landscape and visual impact assessment.

The guidelines describe the central purpose of an EIS (now referred to as an EIAR, following transposition of the EIA Directive in May 2017) as "to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts."

13.1.2 Landscape in the Description of the Receiving environment

The guidelines describe the term 'Landscape' as covering a range of environmental topics including Landscape Character, Landscape Context, Views & Prospects, Historical Landscapes and Man-made Landscapes.

Landscape impact assessment is a combination of two separate but closely related aspects:

The first is **Landscape Impact** -. This aspect defines the impact on the landscape character as a result of physical changes to the fabric of the landscape resulting from assessed development.

The second is **Visual Impact** – This aspect is closely related to landscape impacts but concern changes in views. Visual assessment concerns people's perception and response to visual amenity. Impacts may result from new elements located in the landscape that cause visual intrusion (i.e. interference with or interruption of the view).

The Guidelines recommend systematic, accurate and comprehensive descriptions of the following to be included in any assessment:

Context - Describes areas from which the existing site is visible (with particular attention given to views from roads, residences and designated tourism routes and viewpoints). Areas from where the site can be seen beyond the boundary are noted. Principal landscape features and areas of distinctive character are mapped.

Character – Describes the landscape character differentiates between subjective assessments and objective description. A description of the character of the site that is perceived both from within the site and from the wider landscape is important, as is a description of the intensity and character of land use.

Significance - Description of the quality, value or designation assigned to landscape aspects. It investigates the level of visual intrusion upon designated views, designated landscape and designated landscape amenity areas.
Sensitivities or Vulnerability – These aspects describe changes that altered the character of the landscape significantly. The magnitude of change experienced in the existing landscape or view is described as follows:

High – The existing development has altered significantly the perceived character of the landscape.
Medium – The existing development has altered moderately the perceived character of the landscape.
Low - The existing development has not notably altered the perceived character of the landscape.

13.1.3 Description of Impacts on the Landscape

The report presents an assessment of the significant impacts of the part of the site subject to this EIAR.

Significance of Impacts
As described in this section, this means either the sensitivity to change of the environment that is affected (often reflects its importance), or the importance of the outcome of the impact (the consequences of the change). It is determined by a combination of objective and subjective concerns.

Description of Impacts
The report describes key aspects of impacts, namely character, magnitude, duration and consequence.

13.1.4 Mitigating Impacts on the Landscape

Relevant strategies for impact mitigation as described in the guidelines include:

- **Reduction** – Where the significance of adverse impacts is lessened. Seeks to limit the exposure of the receptor. Reduce the visual intrusiveness of the design and reduce the visibility of the project (e.g. by installing barriers between the location(s) of likely receptors and the source of the impact).

- **Remedy** – Remedy serves to improve adverse conditions by carrying out further works which seek to restore the environment e.g. increased planting of trees/shrubs to offset unavoidable loss of vegetation.

13.1.5 Definition of Visual Impacts

Terminology used in the assessment of impacts is defined as follows:

- **Visual Intrusion** – This occurs where a development impinges on an existing view without obscuring the view.
- **Visual Obstruction** – This occurs where a development obscures an existing view.

The quality of the impact may be described as:

- **Neutral** – A neutral impact neither enhances nor detracts from the landscape character or viewpoint.
- **Positive** – A positive impact improves or enhances the landscape character or viewpoint.
- **Negative** – A negative impact reduces or has an adverse effect on the existing landscape character or viewpoint.

The Duration of impacts is defined as follows:

- **Temporary** Impacts lasting one year or less
- **Short Term** Impacts lasting one to seven years
- **Medium Term** Impacts lasting seven to fifteen years
- **Long Term** Impacts lasting fifteen to sixty years
- **Permanent** Impacts lasting over sixty years also
- **Occasional**
- **Intermittent**
- **Continuous**

The Significance of impacts may be described as follows:

- **None** – There is no change to an existing view. Arises where existing landform, vegetation or the built environment adequately screens the proposal.
- **Imperceptible** – An impact capable of measurement but without noticeable consequences.
- **Slight** – An impact, which causes noticeable changes in the character of the environment without affecting its sensitivities.
- **Moderate** – An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
- **Significant** – An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
- **Profound** – An impact which obliterates sensitive characteristics.

13.1.6 Summary

In summary, this report employs recognised guidelines – 'Guidelines on the Information to be contained in Environmental Impact Statements'– as the basis for landscape and visual assessment and recognises the assessment process as being a combination of assessment of impacts on views from key receptors, and of responses towards the combined effects of the development on landscape character.

Landscape Context and Character are addressed; also, Significance in relation to planning designations and the inherent Vulnerability of the landscape in question. To ensure clarity, it is deemed important to use stated terminology to define impacts arising from the development.

The significance of impacts on the perceived environment depends partly on the number of people affected but also on value judgements about how much the changes matter.

13.2 THE RECEIVING ENVIRONMENT

13.2.1.1 Landscape Context

The entrance to Boycetown Land reclamation is located approximately 1km west of Kiltale. The access road to Boycetown Land reclamation is located off the L6202-3 and R154 regional road. There are no scenic views/routes immediately adjacent to the site in the Meath County Development Plan 2013-2019 or Draft 2021-2027 CDP.

The main objectives of the LVIA are:
- To identify and assess the significance of and the effects of the change resulting from development on the landscape as an environmental resource.
- To identify and assess the significance of and the effects of the change resulting from development on people's views and visual amenity.
(Ref: Guidelines for Landscape and Visual Impact Assessment, Third Edition 2013)

13.2.1.2 Landscape Character

The study area for this landscape and visual assessment consists of an area of 5km radius around the application site. Boycetown Land Reclamation is located in a valley surrounded by lowland rolling hills made up of grassland with a few areas of broadleaf woodland and coniferous plantations located to the south, west and north of the site.

According to the Landscape Character Assessment of County Meath, the site is situated within the central Lowland Landscape Character Type (Type 6).

The lowest parts of the landscape are along the valley of Boycetown River. The lowland landscape area composed of rolling drumlins interspersed with numerous large estates and associated parkland.

Thick wooded hedgerows, and shelterbelts of ash, separate medium to large fields. Roadside drainage ditches and banked hedgerows are a common feature of the landscape in the enclosed rural road corridors. The main transport routes are those radiating from Kiltale including the R154 Trim to Dunboyne. This area is less populated, and the built fabric consists of residential dwellings present adjacent to arterial routes within the vicinity of larger villages such as Kiltale and Trim.

Farmland is a variety of scales with square – rectangular fields divided by hedgerows, which are usually clipped to eye-level adjacent to road corridors but are less well managed away from roads. The agricultural landscape comprises a series of small farms rather than few large ones. Views within this area are generally limited by the complex topography and mature vegetation.

Views of the application sites are generally restricted to close and medium distance views from areas within 0.2km located to the south and east of the site. Potential views from public roads located to the north, northeast, east and southeast are generally blocked by either topography or existing intervening vegetation.

This LVIA uses methodology as prescribed in the following guidance documents:

- Environmental Protection Agency (EPA) publication 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (updated draft 2017) and

the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (updated draft 2017);
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).

Other guidance and references are taken from:

- Meath County Development Plan 2013-2019 Appendix 07 Meath Landscape Character Assessment
- https://meathcountydevelopmentplan.files.wordpress.com/2015/04/appendix-07-landscape-character-assessment.pdf

- Meath County Development Plan 2013-2019 Appendix 07 Meath Landscape Character Assessment- Maps https://meathcountydevelopmentplan.files.wordpress.com/2015/04/appendix-07-landscape-character-assessment-maps.pdf

- Maps- Viewer at Department of Environment, Community and Local Government www.myplan.ie

- National Monuments Service http://webgis.archaeology.ie/historicenvironment/

- Photographs - Landscape Institute Advice Note 01/11; Photography and Photomontage in Landscape and Visual Impact Assessment.

The landscape of the study area contains evidence of human impact such as roads, electricity poles, industry and buildings. There are a number of existing Land reclamations/quarries in the study area. Due to the primarily settled rural character, along with the evidence of industrial activity to the south, the landscape within the study area is considered to be of medium sensitivity to workings within a Land reclamation.

The LVIA assesses how the physical effects of the proposal would impact directly on existing landscape features and resources (i.e. trees, hedgerows, ditches, watercourses, ground levels etc.) within the site boundary.
The LVIA also considers impacts on landscape character made by the removal or alteration of existing features and the introduction of new features.

The assessment of the degree of landscape effects is assessed by considering the sensitivity of the landscape character combined with the magnitude of the effect of the proposed development. Assessing the significance of an effect is a key component of the LVIA and is an evidence-based process combining professional judgments on the nature of a landscape or visual receptor's sensitivity, their susceptibility to change and the value attached to the receptor.

13.2.1.3 Landscape Character Sensitivity

The sensitivity of a landscape relates to its susceptibility to the type of change or development proposed and the value attached to the landscape. The sensitivity of the landscape is graded into four categories: High, Medium and Low as shown in Table 13-1 .

Table 13-1: Criteria for Landscape Character Sensitivity

HIGH	• A landscape that exhibits important characteristics, features or of a particularly distinctive character which are highly valued. • Typically, of national importance. • Low potential or capacity for change.
MEDIUM	• A landscape that is relatively ordinary, with moderately valued characteristics. • Typically, of local importance. • May allow scope for development with some potential or capacity for change.
LOW	• A landscape that has poorly defined landscape characteristics and features that are of little value or interest. • May allow a higher potential or capacity for change from the development.

13.2.1.4 Magnitude/Scale of Landscape Effects

The magnitude of landscape effects is the size and scale of the effect, its duration and whether the effect is reversible. The magnitude of landscape effects is graded into several categories, each of which are described in Table 13-2.

Table 13-2: Criteria for Magnitude/Scale of Landscape Effects

LARGE	Total loss of, or major alteration to key elements / features / characteristics of the baseline, i.e. pre-development landscape and/or introduction of elements considered to be totally uncharacteristic when set within the attributes of the receiving landscape.
MEDIUM	Partial loss of, or alteration to key elements / features / characteristics of the baseline, i.e. pre-development landscape and / or introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
SMALL	Minor loss of, or alteration to key elements / features / characteristics of the baseline, i.e. pre-development landscape and / or introduction of elements that may not necessarily be considered to be uncharacteristic when set within the attributes of the receiving landscape.
NEGLIGIBLE	Slight loss of or alteration to key elements / features / characteristics of the baseline, i.e. pre-development landscape and / or introduction of elements that are not uncharacteristic with the surrounding landscape approximating the ' *no change'* situation.
NONE/ NO CHANGE	No loss, alteration or addition to the receiving landscape resource.

13.2.1.5 Visual Effects

The assessment of effects on views is an assessment of how the proposed development will affect views throughout the study area. Assessment of visual effects therefore needs to consider:

• Direct impacts of the proposal upon views of the landscape through intrusion or obstruction;
• The reaction of viewers who may be affected, e. g. residents, walkers, road users; &
• The overall impact on visual amenity.

The selection of the viewpoints or Visual Reference Points (VRP) to be used in the assessment should be informed by fieldwork, by desk research on access, and recreation, including footpaths bridleways and public land access, tourism including popular vantage points and distribution of population. If necessary, Zone of Theoretical Visibility (ZTV) modelling and analysis may also be carried out to inform more distant viewpoints over a wider landscape area.

13.2.1.6 Sensitivity of Visual Receptors

The sensitivity of visual receptors (people or groups of people) relates to their susceptibility to changes in their views and visual amenity combined with the value attached to a particular view/ visual resource.

The sensitivity of visual receptors is graded into three categories: High, Medium and Low as shown in Table 13-3.

Table 13-3: Criteria for Sensitivity of Visual Receptors/Viewers

HIGH	• Viewers looking out from their homes. Viewers pursuing quiet outdoor recreation like walking, cycling, climbing etc. Viewers in public open spaces and viewers of important landscape features of physical, historical or cultural interest. • Highly sensitive to visual change.
MEDIUM	• Viewers from schools, playing fields, hunters, horse riders who are outdoors for recreation and other outdoor workers like farmers etc. • Moderately sensitive to visual change.
LOW	• Viewers in vehicles passing by on roads or people involved in frequent or infrequent repeated activities. • Less sensitive to visual change.

13.2.1.7 Visual resource Sensitivity

Visual resource sensitivity is defined with reference to the landscape sensitivity of the viewpoint location and the view. Other factors affecting visual sensitivity include:

- The location and context of the viewpoint;
- The occupation or activity of the people experiencing the view; and
- The importance or value of the view.

Although the interpretation of viewers' experience can have preferential and subjective components, there is generally clear public agreement that the visual resources of certain landscapes have high visual quality. Visual resource sensitivity is graded into 3 categories as shown in Table 13-4.

Table 13-4: Criteria for Visual Resource Sensitivity

HIGH	• **Views from private residential property. Recreational views from footpaths, cycle routes and other rights of way. Views from public open spaces and important landscape features of physical, historical or cultural interest.** • **Little tolerance to change**
MEDIUM	• Views from schools, playing fields, hunting grounds and farmyards • Medium tolerance to change
LOW	• Views from office buildings, roads, bridges and trains users with views observed in passing at speed and not central to the view. • High tolerance to change.

13.2.1.8 Magnitude of Visual Effects

The magnitude of visual effect will result in the scale and degree of change in existing views from the addition and/or removal of features within the landscape. These views will be further affected by the duration, distance and extent of change of views upon receptors and their activities. Magnitude of visual effects is defined in Table 13-5.

Table 13-5: Criteria for Magnitude of Visual Effects

LARGE	**Substantial change in the existing view. Complete change in character and composition of the visual baseline.**
MEDIUM	Moderate change in the existing view. This may involve partial obstruction of an existing view or partial change in character and composition of the visual baseline. Change may be noticeable but would not substantially alter the scale and character of the surroundings and the wider setting. Composition of the view would alter. The character of the view may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.
SMALL	Minor change in the existing view. The change would be distinguishable from the surroundings; however, the composition and character of the view would be similar to the visual baseline.
NEGLIGIBLE	Slight or no change in the existing view. The change would be barely distinguishable from the surroundings leaving the composition and character of the view unaltered.
NONE	No change to the existing visual amenity.

13.2.1.9 Degree of Effects

The overall landscape and visual degree of effects of the proposed development was determined by cross referencing the landscape and visual sensitivity with the predicted magnitude of effects

against the matrix in table 6 below. This matrix approach, while helpful is not a prescriptive tool and should also allow for professional judgment in determining the overall degree of effect. The Degree of Effects is shown in Table 13-6.

Table 13-6: Determination of Degree of Effects

LANDSCAPE AND VISUAL RECEPTOR SENSITIVITY	MAGNITUDE OF LANDSCAPE AND VISUAL EFFECTS				
	LARGE	**MEDIUM**	**SMALL**	**NEGLIGIBLE**	**NONE**
HIGH	Major	Major/ Moderate	Moderate/Minor	Minor/ Imperceptible	No change
MEDIUM	Major/Moderate	Moderate	Minor	Imperceptible	No change
LOW	Moderate/Minor	Minor	Minor	Imperceptible	No change

It is to be noted that while the methodology matrix provides a systematic method of evaluation of the visual impact at each viewpoint /Visual Reference Point (VRP), the final judgments are based on the actual visual impact as perceived by the author on the day of the field study.

1.1.1 Planning Policy Context

The Meath County Development Plan 2013-2019, Chapter 10 section 12 lists several policies in relation to the proposed development.

- **LC SP 1** To protect the landscape character, quality, and local distinctiveness of County Meath in accordance with relevant government policy and guidelines and the recommendations included in Meath Landscape Character Assessment (2007) in Appendix 7.
- **LC POL 2** To require that any necessary assessments, including landscape and visual impact assessments, are provided when undertaking, authorising, or approving development.

In addition, three landscape objectives are provided in the Meath County Development Plan:

- ***LC OBJ 1*** *- To seek to ensure the preservation of the uniqueness of all landscape character types, and to maintain the visual integrity of areas of exceptional value and high sensitivity.*
- ***LC OBJ 2*** *- To assess development proposals having regard to the recommendations contained in the Meath Landscape Character Assessment 2007.*
- ***LC OBJ 3*** *- To work in partnership with key stakeholders to promote County Meath as a centre for cultural heritage education and learning.*

Some of the policies relevant to landscape and visual impact are stated below:

- ***RD POL 22****: To facilitate the exploitation of the county's natural resources and to exercise appropriate control over the types of development taking place in areas containing proven deposits, whilst also ensuring that such developments are carried*

out in a manner which would not unduly impinge on the visual amenity or environmental quality in the area.

13.2.1.10 Baseline Studies

This section includes the Landscape and Visual baseline studies based on desktop analysis and field survey.

13.2.1.11 Landscape Baseline

The aim of the landscape baseline study is to provide an understanding of the landscape in the area that may be affected by the proposal – it's constituent elements, it's character and the way this varies spatially, it's geographic extent, it's history, it's condition, the way the landscape is experienced, and the value attached to it. This data was obtained through a desktop study and later reviewed during the field visit.

The landscape baselines study includes the Landscape Character Types of County Meath.

13.2.1.12 Landscape Character Area

LCT's are used to categorise the more geographically specific Landscape Character Areas (LCA's). The current Meath CDP divides the county into 20 Landscape Character Areas (LCA).
The site location in relation to the LCAs can be seen in Appendix 2 Map 2.
Boycetown Land Reclamation planning application site lies in the **LCT Lowland Landscapes- LCA 6 Central Lowlands**

- Landscape Value: **High**
- Importance: **Regional**
- Sensitivity: **Medium**

Landscape Description of LCA 6 Central Lowlands

Large lowland landscape area composed of rolling drumlins interspersed with numerous large estates and associated parkland. Thick wooded hedgerows, with some conifer plantations, and shelterbelts of ash and larch, separate medium to large fields. Deep roadside drainage ditches and banked hedgerows are a common feature of the landscape in the enclosed rural road corridors. The main transport routes are those radiating from Kiltale including the R154 to Athboy – Dunboyne, R156 Trim - Dunboyne and the R154 to Kiltale. In the northeast of the county the R150 and R152 traverse the landscape and connect the Drogheda area with the N2 and onwards to Navan or Kells.

- *This area of western lowland is less populated and the built fabric consists of scattered dwellings, with concentrations of residential dwellings present adjacent to arterial routes within the vicinity of larger villages such as Kiltale and Trim, which have expanded significantly and inappropriately due to development pressure.*
- *The landscape character around settlements tends to be a well-managed patchwork of small pastoral fields, dense hedgerows and small areas of broadleaved woodland particularly in the Kildalkey environs where there are estate landscapes with large mature parkland trees. The landscape is predominantly rolling pastureland, although the landscape surrounding Castlerickard has greater diversity than elsewhere in the lowlands with estate landscape, large conifer plantations, and birch woodland around the Boyne river corridor. In more remote areas, away from settlements, single-track roads wind through less well-managed farmland with rough pasture, overgrown hedgerows and less woodland.*

- *In more remote areas, away from settlements, single-track roads wind through less well-managed farmland with rough pasture, overgrown hedgerows and less woodland.*
- *Farmland is a variety of scales with square – rectangular fields divided by hedgerows, which are usually clipped to eye-level adjacent to road corridors but are less well managed away from roads. The agricultural landscape comprises a series of small farms rather than few large ones.*
- *Views within this area are generally limited by the complex topography and mature vegetation except at the tops of drumlins where panoramic views are available particularly of the Hill of Tara uplands and Skryne Church. Donore village is critical to the setting of Bru na Boinne World Heritage Site and as such any development in Donore would need to be considered carefully.*
- *Short-range views are channelled along narrow valleys between drumlins and often along road or river corridors.*

- **Recommendations for LCA 6 in Meath County Council's Landscape Character Assessment include:**

- *This LCA is in good condition so the existing methods of managing the rural landscape should be maintained.*
- *Maintain the visual quality of the landscape by avoiding development that would adversely affect short range views between drumlins*

13.2.1.13 Landscape Designations

There are **no designated areas** of pNHA, NHA, SAC and SPA within the application area.
The nearest SAC is 5km to the north - the Boyne and Blackwater SAC and SPA.

13.2.1.14 Protected structures and Monuments

Mounds or enclosures tend to be the monument class which form part of the surrounding landscape. There are no recorded structures in the category class 'Mound' or 'Enclosure' within the study area as listed in the National Monuments Service by the Archaeological Survey of Ireland.

13.2.1.15 Visual Baseline

A visual appraisal has been carried out to determine the baseline visual amenity of the surrounding landscape. This assessment was undertaken in June, July 2020.

The aim of the visual baseline study is to establish the area in which

- the development may be visible,
- the different groups of people who may experience views of the development,
- the places where they will be affected and the nature of the views at those points.

(Ref: Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute for Environmental Management & Assessment)

13.2.1.16 Visual Resource

The following visual resources are identified with the potential to have views of the proposed development:

- Views from residential properties;
- Views from the local roads around the site used by motorists, cyclists, pedestrians and other road users that may experience views whilst travelling through the landscape;
- Designated views, prospects and scenic routes

13.2.1.17 Scenic Routes – Views and Prospects and Scenic Routes

The Meath CDP 2013-2019 lists a number of scenic views and prospects adjoining public roads and from publicly accessible places throughout the county to be preserved for the benefit of future generations to enjoy.

Section 9.10 LC OBJ 5 states: *To preserve the views and prospects and the amenity of places and features of natural beauty or interest listed in Appendix 12 and shown on Map 9.5.1 from development that would interfere with the character and visual amenity of the landscape.*

There are **no scenic views and prospects** within the landscape study area of the application site. The following views are outside the direct study area, but relevant to the landscape context around the application site.

13.2.1.18 Visual Receptors

The visual impact of a proposed development is assessed using up to six categories of receptor type as listed below:

- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes;
- Amenity and heritage features.

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. In such cases the VRP will be identified in terms of the primary reason for which they were chosen, but all attributes of the receptor location will be considered in the assessment of its sensitivity.

These photo plates are intended to be representative of the existing visual resource of potential receptors.

Landscape Character of Site and Surrounding

Boycetown Land Reclamation is located on lands, which are gently undulating to flat. Views from the north of the site are enclosed, with medium sized roughly rectangular fields enclosed by strong mature hedgerows and tall mature trees.

The landform is a broadly undulating landscape rising from north to south with numerous hills and relatively gentle slopes. Farming is the primary land use – mainly pasture and some arable crops. The landscape condition is that of an intensively managed agricultural landscape with

well-maintained hedgerow boundaries. In aesthetic terms, the landscape presents a balanced, simple, textured, medium scale, and is quietly pleasant.

The area is not densely populated. There are scattered and well-concealed farmhouses 1km to the north of the site. There are houses sited singly and in groups on the local access roads in the vicinity of Kiltale.

The views of the landscape looking south and west from the site are enclosed. The landscape is formed of medium to small fields bounded by mature hedgerows, single tall trees, copses on undulating land falling on a northeast axis.

The site is bounded by several small-sized agricultural fields with mature hedgerows and tree boundaries to the south and east.

13.2.1.19 Site Description and Access

The Planning application area is of irregular shape, located west of the L6202-3, in the southern area of Boycetown Land Reclamation. The application area of the site has been excavated with parts subject to natural re-vegetation. Existing site boundaries consist of drains, hedgerows and trees. The Boycetown Land reclamation is accessed via the access road off L6202-3 to the east of the site.

Roads
Most of the views are concentrated in an area in close vicinity to the site, within a 0.1km radius. These views can be experienced from sections of the L6202-3, adjacent to the entrance area and along the southern boundary of the site, and from nearby local roads south and west of the site. Views from any other direction are screened by either vegetation or topography.

As stated above, the area for restoration is no more than 5.6ha located in the northern section of Boycetown Land Reclamation and the site may not be visible from all residences and locations along these parts of the roads. The site will also be restored to recreate the natural topographic contours in the area and, therefore, the main visual impact will be during the temporary construction/importation phase of the works.

13.3 POTENTIAL EFFECTS OF THE PROPOSED DEVELOPMENT

The potential effect of the proposed development and its impact on the landscape resources, landscape character areas and visual amenity are noted in this section.

The main landscape impact arising due to the proposed restoration is the change in landform within the site. The other landscape impact would include the removal of small areas of existing vegetation such as treelines of the application site area.

The existing boundary hedgerows and trees along the boundary would be retained and enhanced. Hence the magnitude of change to the surrounding landscape is considered Negligible. The land reclamation will have a negligible effect on the landscape.

The mature hedgerow and trees around the proposed application site, screen potential views of the proposed works from the surrounding area. The character of the surrounding landscape would not be affected by the proposed development.

The study area includes the surrounding agricultural fields on drumlins and rolling hills, with mature hedgerows and trees, and residential houses and farmyards located along the local road. Although the value of the landscape character in this area is High: Meath Landscape Character Assessment, the sensitivity of the landscape character is assessed as **Medium sensitivity.**

The sensitivity of the landscape character of the study area is **Medium** and magnitude of change is **Negligible.**

There would be **Imperceptible to slight beneficial landscape effect** on the landscape resources within the study area.

1.1.2 Landscape Impact on the Landscape Character Area LCA 6

As described in the current Meath County Development Plan Appendix 7: Landscape Character Assessment, LCA 6 is of High landscape value and **Medium sensitivity.**

The application site area is very small in size in the overall context of the LCA 6. The magnitude of the landscape impact arising from the proposed works is **Negligible** on the overall character of the LCA 6 in a Central Lowland landscape resulting in an **Imperceptible landscape effect**.

1.1.3 Impact on Protected Structures and Monuments

There are no protected structures on site and therefore there is no impact on the protected structures in the within the study area due to the proposed development.

1.1.4 Visual Impact of the Proposed Development

Due to the nature of the proposed development, it was found that the actual extent of the development's potential visibility will be restricted to within the application site.

The potential visual impact would be: - the visibility of the operations and the associated infrastructure.

The proposed works involve land reclamation. The visual elements used during the proposed site operations are the mobile plant and trucks. Infrastructure includes the offices/canteen, wheel wash, weighbridge, settlement lagoons.

The application site and the wider Boycetown Land Reclamation Site is bounded by dense hedgerows and mature trees and embankments. Due to the substantial screening, already in place, there would be no views of the proposed operations from around the site boundary within the landscape study are.

The proposed operations would be visually screened by a dense hedgerow boundary to the east providing no views from the local road, which runs to the east of the application site.

The proposed works would be screened from the west, south, north due to the screening provided by hedgerows and tree boundaries. There would be no views of the operations from south and no effect on the visual amenity along local roads.

The designated views and prospects in the Meath County Development Plan are all outside the study area. The Boycetown Land Reclamation site is screened by the intervening topography (dense hedges and treelines). There will be no change to the visual amenity of any other designated views and prospects in the surrounding landscape.

In conclusion, there would be **no change** to the existing visual amenity of the receptors within the study area due to the proposed restoration works at the application site.

13.4 MITIGATION

Mitigation measures are measures proposed to prevent, reduce, offset any significant adverse effects of the proposed development (or to avoid, reduce and if possible, remedy identified effects.)

Mitigation measures may include the following:

- The majority of landscape features like boundary and internal field hedgerows and mature trees contained within the proposed development site will be retained and maintained.
- Providing additional hedgerow or tree planting on the proposed berm is required for screening and in order to reduce views onto the site.
- Selection of native species of trees, shrubs and hedgerow species in keeping with the surrounding landscape to maintain and enhance the biodiversity as well as providing visual screening.

13.4.1 Mitigation at Boycetown Land Reclamation

The aim of the restoration plan is to provide screening to minimise the visual intrusion that may affect the existing visual amenity of the receptors.

The measures include creating and planting screening berms, embankments, maintaining boundary hedgerows, trees and woodland. The restoration plan has been updated to include the proposed works. (Refer to Restoration Plan)

13.4.2 Planting

The proposed planting as shown in the Restoration Plan /Planting Plan aims to screen parts of the site for the duration of restoration and on completion of works, particularly in relation to views of the existing and proposed locations to the north. The planting will also help secure the boundaries of the site and screen views of site. The proposed planting is suitable to the local site conditions and will result in the creation of a diverse ecosystem.

The overall conclusion of the assessment would indicate as follows:

- The restoration of the site had and will have a negligible effect as can be expected with developments of this type; and
- The development is in keeping with the scale/pattern of the landscape.

13.5 CONCLUSION

The application site area is very small in the overall context of the LCA 6. The magnitude of the landscape impact arising from the proposed works is Negligible on the overall character of the LCA 6 in a Central Lowland landscape resulting in an **imperceptible** landscape effect on LCA 6.

The sensitivity of the landscape character of the study area is Medium and magnitude of change is Negligible resulting in an **imperceptible** landscape effect on the landscape resources within the study area.

The proposed operations would be visually screened by the dense hedgerow and tree boundaries at the site.

Over time, when the site is fully reclaimed, there would be diverse habitats created, that would be integrated within the surrounding landscape.

Residual effects will occur when the development is operational and after the incorporation of all mitigation measures.

13.5.1 Cumulative Effects

There are no likely cumulative effects on the landscape from the proposed development.

Residual Impacts (After Mitigation)

On completion of all mitigation measures it is anticipated that the restoration area within Boycetown Land Reclamation will be restored to align with the surrounding topographical levels. The material will be graded, top soiled, seeded with grass seed and left to recolonise which will minimise residual landscape and visual impact.

14 ARCHAEOLOGY/CULTURAL HERITAGE

14.1 INTRODUCTION

The site is situated in south-east County Meath to the west of the village of Kiltale and directly west of the L6202-3. It is situated on a low-lying area between 71 and 72mOD. The soil of the development area is a basic brown earth. The bedrock is Limestone (Gardiner and Radford 1980; McConnell and Gatley 2006).

14.1.1 Historical & archaeological development of the area

The following is a brief summary of the archaeological and historical development of the study area and the main types of sites and monuments that are known from the surrounding landscape. It is intended to indicate the types of sites and monuments known to be present in the study area as well as the pattern of landholding and to place this material in its cultural heritage context. The development is situated in the parish of Kiltale and the barony of Deece. Note the spellings of place names varied throughout history, the historical spellings are used here.

14.1 METHODOLOGY

This report is based on a desktop study of published and unpublished documentary and cartographic sources, followed by a field survey. In light of the legislative protection afforded to the cultural heritage sites this study summarises the archaeological, architectural, cultural and historical importance of the subject area and examines both the potential direct and indirect effects the proposed development may have on the receiving environment.

14.1.1 Desk Based Study

All known cultural heritage sites were reviewed on the Archaeological Survey of Ireland (ASI) along with aerial photography and Ordnance Survey Ireland (OSI) mapping. Sites mapped included the following:

- UNESCO World Heritage Sites including the tentative list of candidate sites;
- National Monuments, be they in the ownership or guardianship of the State, in the ownership of a local authority or monuments under Preservation Orders;
- Record of Monuments & Places (RMP) and Sites and Monuments Record (SMR) from www.archaeology.ie;
- Records of Protected Structures from *Meath County Council*;
- National Inventory of Architectural Heritage (NIAH) for Co. Meath; and
- Demesnes Landscapes and Historic Gardens indicated on the OSI First Edition Mapping.

All townlands located within or in the immediate vicinity of the preferred route option were listed and crossed referenced with:

- National Monuments in State Care, a list for Co. Meath available from www.archaeology.ie; and
- Preservation Orders, a list available from the National Monuments Service.

The baseline historical research included a search of the British and Irish Archaeological Bibliography (www.biab.ac.uk). The National Library of Irelands catalogue (http://catalogue.nli.ie/) was also consulted. Other sources consulted include the Ordnance Survey Records for the area, www.duchas.ie, www.heritagemaps.ie and a number of local history publications (see References).

The *Meath County Development Plan (2013-2019)* was also reviewed. The development plan contains lists of cultural heritage sites including national monuments, recorded monuments, architectural conservation areas and protected structures. The plans also outline the county's heritage policies and objectives that aim to protect and promote the archaeological, architectural and cultural heritage of the region. This evaluation was carried out with due regard to these policies and other relevant information contained within the plans.
To assess the potential impact of the proposal the following sources were also consulted or reviewed:

- Excavations Bulletin;
- Topographical files of the National Museum of Ireland;
- Cartographic Sources;
- Toponyms;
- Aerial photographs;
- Published archaeological inventories;
- Data contained in previous assessments undertaken for the proposed road realignment; and including constraints study, route option assessments and geophysical surveys.

All known cultural heritage sites were mapped along with Ordnance Survey Ireland (OSI) First Edition Mapping (Circa 1830). The following information sources were used for this chapter:

- UNESCO World Heritage Sites including the tentative list of candidate sites
- National Monuments in State Care
- Potential National Monuments in the Ownership of a Local Authority – a list made available from the Department of Arts Heritage and the Gaeltacht (DAHG)
- Sites subject to Preservation Orders a list available from the Department of Arts Heritage, Regional and Rural and Gaeltacht Affairs (DAHRRGA)
- Walled towns, information derived from www.archaeology.ie
- Record of Monuments & Places database from www.archaeology.ie
- Architectural Conservation Areas, information received from the various County Development Plans
- Record of Protected Structures for County Meath
- National Inventory of Architectural Heritage (NIAH) from www.buildingsofireland.ie
- Designed Landscapes and Historic Gardens indicated on the OSI First Edition Mapping
- Designated Landscapes, information received from the Development Plan

In order to assess the potential impact of the proposal the following sources were also consulted or reviewed:

- Excavations Bulletin
- Topographical files of the National Museum of Ireland
- Cartographic Sources
- Toponym analysis
- Aerial photographs

- Published archaeological inventories
- Documentary Sources: a number of literary references were also consulted

Based upon the above inventories and datasets all the recorded sites, monuments and structures together with any cartographic and aerial anomalies, were mapped in GIS to better inform the mitigation strategies. The potential effects of the project have been considered for both known and previously unrecorded archaeological, architectural and cultural heritage sites throughout the construction phase and operation of the development.

Ireland has ratified several European and international conventions in relation to the protection of its cultural heritage. This section summarises Ireland's obligations as a signatory to a number of International and European conventions relating to the protection and conservation of cultural heritage sites. Also included is a synopsis of existing national legislation governing the care and protection of our cultural heritage resource.

The National Monuments Act 1930 to 2004
Irish legislation for the protection of archaeological heritage is based on the National Monuments Acts 1930 and amendments of 1954, 1987, 1994 and 2004. These acts are the principal statutes governing the care of monuments in the Irish Republic. They provide for the protection of national monuments through the use of preservation orders. The overall state archaeological service is provided by the Department of Arts, Heritage and the Gaeltacht (DAHG) and delivered through the Planning and Heritage Section of the DAHG and the National Museum of Ireland (Irish Antiquities Division) on behalf of the Minister. Monuments are protected under the National Monuments Acts in a number of ways:

- National Monuments in the ownership or guardianship of the Minister or a local authority;
- National Monuments, which are subject to a preservation order;
- Historic monuments or archaeological areas recorded in the Register of Historic Monuments; and
- Monuments recorded in the Record of Monuments and Places (RMP).

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Convention, 1972
This Convention provides for the identification, conservation and preservation of cultural and natural sites of outstanding universal value for inclusion in a world heritage list. The World Heritage status is a non-statutory designation and no additional statutory controls result from this designation. However, the impact of proposed development upon a World Heritage Site will be a key material consideration in determining planning applications.

The European Convention on the Protection of the Archaeological Heritage (Valletta Convention), 1997
In 1997 the Republic of Ireland ratified the Council of Europe, European Convention on the Protection of the Archaeological Heritage (the 'Valletta Convention'). Obligations under the Convention include provision for statutory protection measures, including the maintenance of an inventory of the archaeological heritage and the designation of protected monuments and areas.

The European Convention on the Protection of the Architectural Heritage (Granada Convention), 1997
Under this convention the Republic of Ireland is obliged to maintain inventories of architectural heritage, to protect the architectural heritage and adopt conservation policies as integrated planning objectives.

The Architectural Heritage and Historic Properties Act, 1999
This Act provides for the establishment of a national inventory of architectural heritage local authorities use it to inform the compilation of their Record of Protected Structures which, under the Planning and Development Act 2000, does afford legal protection.

The European Landscape Convention 2000
In 2002 Ireland ratified the European Landscape Convention - also known as the Florence Convention, which promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. It is the first international treaty to be exclusively concerned with all dimensions of European landscape.

The Planning and Development Act 2000
Under arrangements which came into operation on 1 January 2000 (The Planning and Development Act 2000), the system of listing buildings was replaced with strengthened procedures for the preservation of protected structures and structures in architectural conservation areas (ACA).

EIA Directive 85/337/EEC as amended
In order to assist the competent authorities in deciding if significant effects on the environment are likely to arise in the case of development below the national mandatory EIS thresholds, the Minister for the Environment, Heritage and Local Government published a Guidance document in August 2003.

ICOMOS Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005
Ireland is a signatory to an international declaration sponsored by International Council on Monuments and Sites (ICOMOS) that endeavours to ensure the safeguard and conservation of the World's cultural heritage as part of its sustainable and human development.

The Planning and Development Act 2006-2009
The Planning and Development (Strategic Infrastructure) Act 2006 ensures the protection of the archaeological heritage resource by requiring that all applications under this Act are accompanied by an EIS including information on material assets, including the architectural and archaeological heritage, and the cultural heritage.

14.1.2 Other Policy Contexts and Guidelines

The National Inventory of Architectural Heritage (NIAH)
The NIAH is a state initiative that forms the basis for recommendations by the Minister of DAHG for inclusion in the Record of Protected Structures under the Planning and Development Act 2000.
The Framework and Principles for the Protection of the Archaeological Heritage guidelines, 1999
This document sets out the basic principles of national policy on the protection of the archaeological heritage. A key principle set out in these guidelines is that there should always be a presumption in favour of avoidance of developmental impacts on the archaeological heritage and preservation in-situ of archaeological sites and monuments must be presumed to be the preferred option.

14.1.3 Historical Period

14.1.3.1 Mesolithic Period (8000-4000 BC)

The Mesolithic (middle stone age) people were the first inhabitants of Ireland, arriving about 9000 years ago. They were a mobile society relying on wild resources for food, which was hunted and gathered using stone tools as well as boats, nets and traps. Settlement was in temporary and semi-permanent groups of huts constructed of wood slung with hide, which may have operated as seasonal or hunting camps. Mesolithic activity to date shows a marked concentration in the north-east of Ireland this can in part be attributed to both the availability of flint and the large number of antiquarians and collectors in the region and suggests that activity in this period was widespread in the country, with settlers probably utilising the extensive coastline for fish and shellfish. It is estimated that throughout the Mesolithic period the population of Ireland was probably never more than a few thousand. Due to the transitory nature of Mesolithic encampments evidence for settlement activity can be scarce and, in many cases, can only be determined by flint scatters in the form of microliths, flake axes and core axes. In 2004 flints and four conical fish traps were found in Clowanstown, Co. Meath by a team of archaeologists directed by Matt Mossop of Archaeological Consultancy Services Ltd. Although flattened the traps retained a distinctive V-shape with evidence for constrictions at the open ends. Slender rods and twisted wefts of alder, birch and rosewood were woven together using an open-twined technique. The traps would originally have been positioned on the bed of a small lake adjacent to a mooring or walkway. Also found at the site was a possible model boat made from a fruitwood such as apple, pear or hawthorn, dating to between c.5300–5050 BC.

14.1.3.2 Neolithic Period (4000-2500 BC)

The practice of farming spread from the Middle East, through eastern and southern Europe to reach Ireland via Britain around 4000BC. Ireland's Mesolithic hunters were, over a period of time, displaced or assimilated by the new Neolithic settlers. This transition fundamentally changed the local economy from one based on hunting and foraging to one of cereal cultivation and livestock rearing. The arrival of the first farmers resulted in land clearance by burning or chopping down trees with stone axes. There were no indigenous cereal crops, but the settlers brought with them wheat and barley as well as domesticated sheep, goats and cattle. Tending of crops and animals required a more sedentary lifestyle and larger permanent settlements.

Farming as a practice required new skills and, more importantly, new tools. This demand resulted in the development of specific crafts. Polished stone axes, ards (ploughs), flint tools for harvesting crops, and stone saddle querns for grinding the grain required the exploitation of specific stone sources. Flint remained an important stone for the production of tools and weapons, objects such as javelin heads, mace heads, polished axes and fine leaf and lozenge shaped arrowheads were used for both hunting and warfare. During this period the first long distance trade networks were established. Stone axes from Britain, a flint axe from Scandinavia, pitchstone from Scotland, and jadeite axes from the Alpine area of northern Europe have all been found throughout the country. Pottery also makes its first appearance in the archaeological record. The pots were handmade, coil built, and fired in bonfires or pits. The earliest pots were mainly undecorated round bottomed bowls, although decoration became more common in the later part of the period. Towards the end of the Neolithic a great diversity in pottery styles existed and flat based pottery was introduced.

Neolithic activity is more apparent in the archaeological record of Meath due to the presence of a number of known megalithic monuments. Megalithic monuments can be divided into funerary monuments, communal tombs for the burial of the dead, and those with a more esoteric function such as stone circles, stone rows or single standing stones whose function was probably ceremonial. These

monuments indicate status, knowledge of engineering, and the ability to organise resources, including labour. These tombs are divided into four classes; court tombs, portal tombs, passage tombs and wedge tombs. Wedge tombs are so named by the distinctive manner in which the roof slopes down towards the back of the tomb and are taller and wider at the entrance. Court tombs generally consist of a long cairn with a court at one end providing access into a gallery beneath the cairn (Waddell (2000), Prehistoric Archaeology of Ireland). Portal tombs are single chambered monuments where the entrance is flanked by two large portal stones.

The megalithic tradition in Meath is dominated by the Brú na Bóinne World Heritage site containing the three large passage tombs of Knowth, Newgrange and Dowth. The construction of this passage tomb cemetery commenced sometime around 3300BC and by this time, the area had developed into an open farmed landscape with evidence for domestic houses and occupation scattered throughout. The construction of at least 40 passage tombs displays a sophisticated knowledge of architecture, engineering, astronomy and artistic endeavour indicative of a highly organised and settled society. The Brú na Bóinne tombs, particularly Knowth, contain the largest assemblage of megalithic art in western Europe. The international importance of the Newgrange, Knowth and Dowth sites has resulted in the area being designated a UNESCO World Heritage Site.

14.1.3.3 The Bronze Age (2500 -500 BC)

As stone tools were replaced by the use of copper, which was later combined with tin to make bronze, the structure of society also changed. The somewhat crude copper objects were soon replaced by more durable bronze tools including axes, swords, spears, knives, halberds and cauldrons. Gold jewellery from this period in the form of lunulae, torcs and bracelets are amongst the finest in Europe and hint at the presence of new social elites. In a domestic context, dwellings changed from a general rectangular plan, typical of the Neolithic, to circular arrangements evidenced on excavation by postholes and slot trenches. Middle Bronze Age and Late Bronze Age settlements are usually located on well drained soils suitable for agriculture and near rivers or fording points for ease of transport and communication.

The funerary traditions of this period changed gradually with a move away from Megalithic Monuments to individual burials or cremations in stone lined cists. Burials were often made within cemeteries or barrows defined by an oval or circular artificial mound of earth and stone. These barrows are generally less then 20m in diameter and may include circular ditches or embankments. There is an embanked barrow in nearby Walterstown (ME037-055) and a ring ditches in Mitchelstown SMR ME037-045- both found in recent years from aerial imagery.

One of the most ubiquitous sites of this period is the Fulacht Fiadh. These sites are defined by a mound of fire cracked stones over a sunken wooden trough. Often these sites have been ploughed out and survive as a spread of heat shattered stones in charcoal rich soil. These sites are generally found near water sources in low lying ground with their function variously described as for cooking, bathing, textile production or brewing.

14.1.3.4 The Iron Age (c. 500BC to 500AD)

In late Bronze Age Ireland, the use of the metal reached a high point with the production of high-quality decorated weapons, ornament and instruments, often discovered from hoards or ritual deposits. The Iron Age however is known as a ‘dark age’ in Irish prehistory. Iron objects are rarely found due to poor levels of preservation, Life in Iron Age in Ireland seems to have been much as it was in the early historic period – mixed farmers living in or around small defended settlements, with late Bronze Age hillforts and hilltop enclosures in use throughout this period. In Meath the primary focus of Iron Age

activity is associated with the Royal site of Tara. This complex was both the seat of the kings of Meath and the High King. The site is strongly linked to myth and legend and is associated with the transformation of Ireland from paganism to Christianity. The oldest visible monument on the hill is the Mound of the Hostages the name derives from the custom of high kings to retain hostages from subject kingdoms to ensure their submission. Niall of the Nine Hostages is famously associated with this practice, holding hostages one each from the five provinces of Ireland and four from Britain.

14.1.3.5 Early Medieval Period (c. 500AD-1100AD)

With an expansion in population, the Early Medieval Period witnessed the introduction of a new settlement type generally known as the ringfort. Other names for this site type include rath, lios, cashel and dun. These circular enclosures, numbering between 30,000 and 40,000 across the country, represent the homesteads of the upper echelons of Irish Early Medieval society. Ringforts are generally circular areas surrounded by a bank(s), walls and an external ditch. In some cases, there can be up to three sets of defences. The larger more impressive multivallate, raised and platform raths are generally regarded as higher status settlements and are the foci around which the smaller satellite univallate enclosures would be arranged. This relationship is the physical evidence for the Tuath system characterised by petty kingdoms, sovereign in their own right that paid fealty to a larger regional / provincial state. Ringforts and enclosures represent the most numerous of Meath's recorded archaeological sites. The nearest rath's to the subject site are SMR's ME037-058 and ME037-061 located to the west.

In the fifth century Christianity was introduced to Ireland and monastic sites began to be founded throughout the country. Many sites in Meath are said to have specific association with St. Patrick. In particular the Hill of Slane was the symbolic site of the lighting of the first Paschal Fire by St Patrick in 432 AD in defiance of King Leoghaire. A number of St. Patrick's disciples established churches and monasteries throughout Meath such as that founded by St Erc founded at Slane and that at Trim by St Loman. Between the 6th and 8th centuries the influence of the Church continued to grow and through the secular and ecclesiastical legislation, it is possible to trace the gradual assimilation of the Church into early Irish society (Edwards (1996). In the 9th Century Meath suffered from invasions by the Vikings using the Boyne to target monastic centres and local populations. These attacks finally ceased in 980 when the Danes were defeated at Tara and the survivors became absorbed into the native population. Prior to the Cambro-Norman invasion of 1169 – 1172 the subject area was located in lands held by the Southern Uí Néill in the 'middle kingdom' of Mide and the adjoining Plain of Brega area.

14.1.3.6 Medieval Period to Late Medieval (c. 1100AD-1650AD)

The start of the medieval period is defined by the arrival of the Anglo-Normans in 1169. Originally invited by Diarmuid Mac Murchada as mercenaries to assist in the recovery of his Leinster Kingdom, the Anglo-Normans quickly set about making territorial claims for themselves. In March 1172 King Henry II granted control of Meath to one of his strongest baron's Hugh de Lacy on condition that de Lacy could personally retain the kingdom with near total autonomy, if he could conquer it. By 1175 he had accomplished his goal by conquering the territory, killing his Gaelic rival Magnus Ua Máel Sechlainn and marrying Rose Ní Conchobair, the High-King's daughter, cementing his claim as Lord of Meath. De de Lacy in return divided his new territory amongst his barons, who immediately began organising its colonisation and settlement. These baronies were divided up into smaller units known as manors, many of which evolved into modern towns -Manors generally comprised a fortification (usually a motte or later a tower house), a church and a number of dwellings. Galtrim townland to the south west of the subject site is typical of this and contains both a 7m high by 62m wide motte (SMR ME043-002-) and a medieval church (SMRME043-001-). Ginnets Great townland 1.2km also contains a motte (ME037-020--) on a section of an esker ridge.

During the reign of Henry VIII, in a wider battle with the Pope, Irish church property 'fell into the hands of the king on the dissolution of the monasteries' and was distributed among his supporters. Several of the abbeys manors were adapted for use as 'big houses' and the hold over the countryside fell even more firmly into the hands of the landowning class.

14.1.3.7 Post Medieval Period AD 1600 to 1900

Boycetown is recorded as a townland in Galtrim parish in the Down Survey map. In the early part of the 17th much of the land in the subject area was owned by the Catholic Barnewall family. Following the Cromwellian conquest, the lands were confiscated and granted to Sir William Thompson.

14.1.3.8 Lewis's Topographical Dictionary of Ireland 1837

GALTRIM, a parish, in the barony of LOWER DEECE, county of MEATH, and province of LEINSTER, 3 miles (S.) from Summerhill, on the road to Navan; containing 716 inhabitants. This parish comprises 3953 statute acres, of which about two-thirds are under tillage.

Galtrim House, a handsome residence in a well planted demesne, is the seat of J. Fox, Esq., who is descended from Magnus Nial, Monarch of Ireland, and is the representative of the Lords of Kilcourcy, to whom Queen Elizabeth granted large possessions. This district was anciently a palatinate: the parish was granted by the Irish parliament, in 1543, to the priory of St. Peter's near Trim. The living is a vicarage, in the diocese of Meath, and in the patronage of Thomas Hussey, Esq.; the rectory is impropriate in Joseph Ashe and George Fisher, Esqrs. The tithes amount to £176. 12. 3., of which £21. 12. 3. is payable to the impropriators and the remainder to the vicar: the great tithes of the townlands of Walterstown and Branganstown, amounting to £35, are payable to the incumbent of Kentstown. The glebe-house, which has a glebe of nine acres, was built by aid of a loan of £300 and a gift of £400, in 1815, from the late Board of First Fruits. The church, which is a neat edifice with a tower, was erected in 1800. In the R. C. divisions it is part of the union or district of Kilmore, or Monalvey, and has a neat plain chapel at Boycetown-bridge. About 70 children are educated in the parochial school, which is partly supported by the vicar and W. Disney, Esq.; and there is a small private school.

14.1.3.9 Buildings

Designated structures

According to the Meath County Development Plan **2013-2019** there are no structures listed in the Co. Meath Record of Protected Structures situated within the application area.

Non-designated structures

There are no structures listed in the National Inventory of Architectural Heritage (NIAH) situated within the application area or in the study area.

Impacts

There are no designated or undesignated structures situated within the application area or in the vicinity that will be impacted.

14.2 ARCHAEOLOGICAL ASSESSMENT

14.2.1.1 Cartographic Sources

According to the Ordnance Survey 1st and 2nd edition six-inch maps of the area, there is no indication of any previously unrecorded archaeological sites or monuments.

14.2.1.2 Previous excavations

Examinations of the Excavations Bulletin and the Excavations Reports available on the National Monuments website www.archaeology.ie indicated that there have been no archaeological excavations carried out on the site.

14.2.1.3 World Heritage Sites

There are no UNESCO World Heritage sites within 20km of the proposed development.

14.2.1.4 National Monuments in the Ownership or Guardianship of the State

On a national level the highest degree of protection granted to archaeological monuments are those afforded National Monument status protected under the National Monuments Act of 1930 and its various amendments, these are the pre-eminent archaeological sites in Ireland. These sites are either in state ownership or guardianship or are the subject of protection orders and include Walled Towns. Generally National Monuments in state care are numbered amongst the best preserved and most impressive monuments in the country.

There are no sites within State care within 1km of the project area.

14.2.1.5 Record of Monuments and Places (RMP)

Sites that are not in state care are listed in the Record of Monuments and Places. This inventory consists of nationwide set of 6" maps with an accompanying index which shows all the sites, monuments and zones of archaeological potential, recorded to date. The inventory concentrates on pre 1700 AD sites. Monuments and places included in the record are protected as follows:

"When the owner or occupier (not being the commissioners) of a monument or place which have been recorded under subsection (1) of this section or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Commissioners, commence the work for a period of two months after having given the notice".

It should be noted that RMP'S are protected by the National Monuments Act but that the care and preservation of these features depends largely on the interests and respect of the individual landowners. All the County Development Plans have policies asserting the protection and preservation of archaeological sites, which have been identified in the Record of Monuments and Places.

It has been noted that there are several designations/terms that cover archaeological monuments, including the SMR, Record of Monuments and Places (RMP) and Register of Historic Monuments (RHM). For the purposes of this project archaeological monuments will be referred to as SMR sites as the Sites and Monuments Database contains the most up to date list of sites, including sites that are not contained in either the RMP or RHM.

There are no Recorded Monuments situated within the application area. There is one Recorded Monuments situated within 250m of the Planning application area.

ME041-061 _ Ring ditch
Distance to site – 200m west of the site
Townland - Boycetown

Located on what might be a rise in a fairly level landscape. The parch-mark in grass of a circular enclosure (int. diam. c. 15m) defined by a wide fosse feature (Wth c. 2-4m) is visible only on Google earth .

ME041-058 _ Ring ditch
Distance to site – 200m west of the site
Townland - Boycetown

Situated in parched pasture on what might be a rise in a fairly level landscape. The vegetation mark of a small enclosure (int. diam. c. 5-7m) defined by a wide fosse feature is visible on Google Earth. It is also visible on OSI images (1995).

14.2.2 Toponym Analysis

Townland names are useful in terms of understanding the geology, archaeology, land use, ownership and folklore of an area. The names can provide information on families, topographical features, and historical incidents. In terms of the built environment many names reference churches, fords, castles, raths, graveyards, roads and passes etc. The names feature on the Ordnance Survey maps, the first edition of which was completed for the whole country circa 1842. In the compilation of the Ordnance Survey scholars, such as Eugene O'Curry and John O'Donovan, were commissioned to provide the survey with the anglicised forms of the Irish place-names, and it is these anglicised forms that have been in general use ever since. In compiling the following data, a number of resources were consulted including the Placenames Database of Ireland www.logainm.ie and Irish Names of Places by P.W. Joyce (1913).

Table 10-5 Townland Names

Name	Translation
Boycetown	Unconfirmed (Boyce'sTown)

14.2.2.1 Aerial Photography

Aerial archaeology provides a high-level view of the historic environment based on conventional photography and a range of remote sensing technologies. It is relevant to all stages of archaeological work particularly reconnaissance, interpretation, and analysis.

Archaeological sites may show up on the ground surface, depending on their state of preservation, by light and shadow contrasts (shadow marks), tonal differences in the soil (soil marks) or differences in height and colour of the cultivated cereal (crop marks).

A review of online images via the Ordnance Survey website, Google and Bing Maps dating from 1995 to the present did not provide any evidence for any previously unrecorded sites.

14.2.2.2 Cartographic Research

Analysis of historic mapping shows how the landscape has changed over time. The comparison of editions of historic maps can show how some landscape features have been created, altered, removed or developed over a period of time. Sometimes features that appear on these early maps are found to be of potential archaeological significance during fieldwork. For this study the following historic maps were consulted:

- Down Survey map 1656
- A map of the county of Meath, by William Larkin 1812.
- First edition Ordnance Survey 6" Maps circa 1837; and
- Second edition Ordnance Survey 25" Maps circa 1900.

14.2.2.3 Architectural Conservation Areas (ACA)

The Planning and Development Act 2000, as amended, provides that all Development Plans must now include objectives for preserving the character of Architectural Conservation Areas (ACAs). An ACA is a place, area, group of structures or townscape of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, or which contribute to the appreciation of protected structures. In these areas the protection of the architectural heritage is best achieved by controlling and guiding change on a wider scale than the individual structure, in order to retain the overall architectural or historic character of an area.

There are no designated ACA's within the project area

14.2.2.4 National Inventory of Architectural Heritage (NIAH)

County surveys, established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 provides an index of structures deemed to be of architectural, historical, archaeological, artistic, cultural, social, scientific or technical interest. The NIAH inventory also provides valuable information to local authorities on the rich heritage of the country's demesnes, parks, gardens and designed landscapes.

The results of the NIAH surveys are available online at www.buildingsofireland.ie. Each entry comprises a site description and appraisal providing a qualitative account of why the building is an important part of Irish architectural heritage justifying its inclusion. The inventory also rates the structures on a scale ranging from local, regional, national to international. This information should ensure that the structures with the highest ratings can be avoided.

There are no designated NIAH sites within the project area.

14.3 POTENTIAL EFFECTS

Potential construction impacts may be direct, physical impacts on known and previously unrecorded archaeological, architectural or cultural heritage sites, structures, monuments or features. In relation to the proposed development, direct, physical impacts on the archaeological, architectural and cultural heritage can manifest themselves in the following ways:

- Where an archaeological, architectural or cultural heritage site, structure, monument or feature is located within an area where works takes place and the works either intentionally or unintentionally entail the alteration or removal of all or part of the site, structure, monument or feature a direct, physical impact will occur;
- Direct, physical impacts can also occur in gaining access to the site. Where archaeological, architectural or cultural heritage sites, structures, monuments or features are intentionally or unintentionally removed or altered when transporting and/or facilitating access for machinery, equipment and/or materials to or from site a direct physical impact will occur; and

- There is the potential for direct, physical impacts on previously unrecorded archaeological and architectural sites, structures, monuments or features.

If these impacts cannot be remediated, for example if archaeological deposits are destroyed during excavations, then the impacts will be permanent.

14.3.1.1 Potential direct impacts on recorded archaeological Sites during the development and operational Phase

There are no recorded archaeological monuments within the confines of the red line boundary for the site.

14.3.1.2 Potential direct impacts on unrecorded archaeological Sites during the development and operational Phase

There are no proposed excavation works that may negatively impact on previously unrecorded sub-surface sites.

Operational Phase

If the proposed mitigation measures are implemented and resolved during the construction phase, there should be no impacts to the local archaeological resource during the operational phase.

'Do Nothing scenario'

In this instance there would be no impact on any potential unrecorded sub surface deposits.

'Worst case scenario'

If the proposed development where to proceed without the implementation of proposed archaeological mitigation measures construction work could directly impact on archaeological features resulting in significant negative impacts.

14.3.1.3 Architectural Sites Construction Phase

There will be no direct impacts on any Protected Structures, NIAH sites or previously unrecorded vernacular features during the reclamation phase.

14.3.1.4 Potential Indirect Impacts

Indirect impacts can take the form of impacts on the settings of architectural or cultural heritage features – impacts on setting are primarily visual and examine the effect of the development upon the setting of a site within the wider landscape. Visual impacts can be reduced with sensitive site development and screening.

Operational Phase

If the proposed mitigation measures are implemented and resolved, there should be no impacts to the local archaeological resource during the operational phase.

14.3.1.5 Architectural Sites

There are no recorded structures or NIAH sites within the proposal area.

14.4 MITIGATION MEASURES

It is recommended that archaeological monitoring of any topsoil stripping be carried out by a suitably qualified archaeologist in advance of any site works.

In the event of the discovery of archaeological finds or remains the relevant authorities should be notified immediately, and allowance be made for full archaeological excavation, in consultation with the National Monuments Service of the DAHRRGA.

14.5 CONCLUSIONS AND RESIDUAL IMPACTS

Based on the above research it is clear that the wider area has a rich and varied archaeological past with multi period monuments ranging from barrows, enclosures and ringforts to the remains of ruined castles and demesne landscapes.

If the above recommendations are fully implemented the residual impacts of the proposed development on the local cultural heritage resource would be negligible.

15 INTERACTION OF THE FOREGOING

This Environmental Impact Assessment Report (EIAR) has been prepared by Ray Gilmartin – Agricultural Consultant on behalf of Davin Plant Hire Ltd and accompanies a planning application to Meath County Council for recovery of Inert stone and soil for the purposes of restoration at Boycetown Land Reclamation, Boycetown, Dunsany, Co. Meath.

The potential environmental impacts of works at this location have been outlined in this report. This section discusses the potential for interaction between impacts of the different environmental aspects.

15.1 INTRODUCTION

Table 16.1 below outlines the different environmental aspects which have potential to interact as a result of the proposed development. Interactions have been clearly identified in the early stages of the project and where the potential exists for interaction between environmental impacts, the EIAR specialists have taken the interactions into account when making their assessment. Potential interactions (both positive and negative) have been considered for the construction, operation and decommissioning phases of each of the different environmental aspects.

Table 15-1: Interaction between Environmental Aspects (positive and negative)

Interaction Matrix	Biodiversity	Land,	Hydrology (Water)	Landscape & Visual	Soils & Geology	Air Quality & Climate	Noise & Vibration	Traffic & Transport	Archaeology, Cultural Heritage	Population & Human Health
Biodiversity		√	√	√			√	√		
Land,			√	√	√	√			√	√
Hydrology										√
Landscape& Visual							√	√	√	√
Soils & Geology						√				√
Air Quality & Climate								√		√
Noise & Vibration								√		√
Traffic &Transport										√
Archaeology, & Cultural Heritage										
Population & Human Health										

15.2 DISCUSSION OF INTERACTIONS

In addition to Table 15.1, the following section summarises the primary interrelationships of aspects of the environment with the potential for significant effects as a result of the proposed development.

15.2.1 Human Beings

Human beings will interact with other environmental aspects including landscape and visual impacts, air quality and climate, noise impacts and traffic impacts, associated with the proposed development.

Interactions of Human Beings and Landscape & Visual Impacts
There will be no significant interaction between human beings and landscape and visual impacts during the construction phase of the development.

Based on the visual effect assessment undertaken for this development, effects are not considered to be significant. With respect to cumulative effect, the proposed development will most commonly be viewed in isolation from within the lowland context of the study area.

Interactions of Human Beings, Air Quality, Climate, Land, Soils and Geology and Hydrology and Hydrogeology

During the construction phase of the development, there is potential for short-term interaction between human beings, air quality, climate, hydrology/hydrogeology and land, soils and geology. This interaction is primarily associated with the disturbance of ground within the proposed development site which may result in suspended solids and dust emissions. Suspended solids, unmitigated, may enter nearby watercourses and be transported off site by construction vehicles. Dust emissions, unmitigated, may impact on air quality.

It should be noted that the area that may potentially be disturbed for the proposed development infrastructure is small. In addition, detailed mitigation measures are proposed within Land, Soils and Geology, Hydrology and Air Quality of the EIAR to reduce the potential direct and indirect impact on human beings from the proposed construction works. A CEMP will include further details on dust suppression and surface water management plans for the construction phase of the development.

Interactions of Human Beings and Noise Impacts

Developments generate noise in the vicinity of the development during both their construction and operational phases. Noise impacts have been considered in Chapter 12 of the EIAR and it has been found that during both the proposed development, these impacts are predicted to be within the relevant guidance limits. Likewise, any works required during the decommissioning of the proposed development will not result in a significant noise impact on nearby sensitive receptors.

Interactions of Human Beings and Traffic Impacts

Public perception of the construction phase will be influenced primarily from the impact of traffic movement. When taken in context with the existing traffic flows in the area, the construction of

the proposed development will not result in a significant increase in traffic volumes on the surrounding road network. Any increase will be short term in nature (expected duration of 4 years) and once the development is operational, traffic movements to and from the site will be imperceptible.

15.2.2 Landscape and Visual Impact

Interactions of Landscape and Visual and Tourism & Amenities

There will be no significant interaction between Landscape and Visual Impacts and Tourism and Amenities during the construction phase of the development.

Taking into account all of the evidence from the photos the proposed development will not result in a significant level of landscape and visual impact.

Interactions of Landscape and Visual and Cultural Heritage

There will be no significant interaction between Landscape and Visual Impacts and Cultural Heritage during the development.

15.2.3 Biodiversity

Interactions of Biodiversity, Lands, Soils & Geology and Hydrology & Hydrogeology

Exposed soils during the construction phase has the potential, if not properly managed, to cause sedimentation of nearby drainage channels. It is envisaged that the placement of soils could potentially lead to increased suspended solids in surface water run-off. However, mitigation measures will be put in place to control siltation occurring during the construction phase and ensure protection of the aquatic environment. Excavation and removal of soils for the construction of permanent features such as hardstands and access tracks may potentially lead to habitat loss. There is also the potential, if not properly managed, for a negative interaction between the site drainage regime and aquatic ecology during the construction phase of the proposed development.

Suitable mitigation measures will be put in place to control erosion and sedimentation of receiving waters including a berm and settlement lagoon. During the construction and operational phases of the development, the existing on-site drainage scheme and the surface water management plan for the development will ensure that there is no negative interaction between Lands, Soil and Geology, Hydrology and Hydrogeology and Biodiversity by controlling the runoff of water from the site (at greenfield run off rates) and via controlled and carefully designed surface water attenuation lagoon.

Mitigation measures will be implemented during the decommissioning phase of the development, similar to the construction and operational phase, to ensure that there is no significant interaction between Lands, Soil and Geology, Hydrology and Hydrogeology and Biodiversity.

Interactions of Biodiversity and Landscape and Visual

There will be no significant interaction between Biodiversity and Landscape and Visual Impacts during the construction phase of the development.

There is the potential for interaction between Biodiversity, in terms of Landscape Character, and Landscape and Visual during the operational phase of the development. However, this interaction is not deemed to be significant.

Interactions of Biodiversity, Noise and Vibration and Traffic and Transport

There is potential for interaction between biodiversity, noise and vibration and traffic and transport during the construction phase of the development. However, as noted above, noise and vibration impacts during both the construction and operational phases (and the decommissioning phase) of the proposed development are predicted to be within the relevant guidance limits.

Detailed baseline surveys of the biodiversity in the local and regional area of the proposed development have been undertaken and, as a result of the incorporation of the findings of the surveys into the project design and site layout plan, construction works will be carried out at a significant distance from protected areas of biodiversity. Traffic using the site during the construction, operational and decommissioning phases of the development will be restricted to the use of the designated internal access tracks. Potential direct and indirect effects on Biodiversity have also been considered in the AA Screening Report and NIS that accompanies this application and mitigation measures proposed, where appropriate.

15.2.4 Traffic and Transport

Interactions of Traffic and Transport and Air Quality and Climate

There will be no significant interaction between Traffic and Transport and Air Quality and Climate during the construction and decommissioning phases of the development, with the exception of exhaust emissions from construction vehicles. This is a short-term, temporary impact and is addressed in the CEMP, Appendix 2.4.

As the potential traffic associated with the operational phase of the proposed development will be very low, there will be no significant interaction between Traffic and Transport and Air Quality and Climate.

15.2.5 Cultural Heritage

Interactions of Cultural Heritage and Lands, Soils & Geology

For the proposed development, the design of the development incorporated the results of historical and project-specific archaeological surveys within the application area. No sites with statutory protection will be directly impacted by the proposed development.

The construction works (ground disturbance) associated with the proposed development will be monitored by a suitably qualified archaeologist working under licence.

15.3 CONCLUSION

All environmental factors are interrelated to some extent. However, the most common interactions are between human beings and visual perception, noise, air quality and ecological resources. Having studied the interaction of potential impacts during the construction, operational and decommissioning phases it has been determined that no amplification effect is anticipated. The proposed development will have some positive impacts on an international, national, regional and local level. It is important to note that the physical, environmental and landscape and visual impacts are almost entirely reversible upon decommissioning of the development.